PHY 104

PHYSICS (1)
Term 2 (Level-3) - 2014

Course Profile

All details in this course profile for PHY 104 have been officially approved by College of Computer and Information Science, Majmaah University. The information will not be change unless absolutely necessary and any change will be clearly indicated by an approved correction included in the profile.

General Information

OVERVIEW

Physics is `*the*' fundamental science. Computer science students have good reason to learn some fundamental aspects of Physics. The physical theories are inspired by the computational theories are much better tailored for Computer Science applications as compared to their low-level counterparts. For example, the current tools available for developing quantum algorithms using 'network algorithms'.

The goal of physics is no less ambitious than to find and understand the laws that govern everything in the Universe starting from the behavior of the smallest building blocks of matter to the structure of the space-time and the Universe itself. Physics generates fundamental knowledge needed for the future technological advances that will continue to drive the computer engineer of the world. The emphasis on study of Physics aims to gain understanding of the basic concepts and principles of Electricity and magnetism, which is relevant to their further studies. . The most fundamental processes in nature, from the forces that determine the structure of atoms and molecules to the phenomena of light to nerve impulses in living systems, depend on electric and magnetic fields.

Electricity and magnetism is fundamental to current and future technologies. Motors, power generation and transmission, electronics, sensors, and communication – both wired and wireless – involve the manipulation of electric or magnetic fields. There are few advances in technology that can be made without the use of electronic circuits or electric and magnetic fields. A large and diverse body of observational facts can be explained in terms of a few simple concepts. The phenomena of electricity and magnetism, which

appear to be completely different, are shown to be two manifestations of the same physics. The theory requires few if any approximations. Results can be predicted with great accuracy.

Of the various ways to approach science, physics in general, and E&M in particular, starts with the smallest set of fundamental assumptions. Quantitative rigor in solving important problems is rewarded by unprecedented agreement with measured results.

Get strong understanding of the concepts and principles of Electromagnetism through lectures, Laboratory experiments and assessment tools.

DETAILS

Level	3
Credit Points	3

PRE-REQUISITES OR CO-REQUISITES

Pre-requisite: Physics (1);PHY 104

ATTENDANCE REQUIRMENTS

All CSIS students are expected to attend scheduled classes, these classes are identified as a mandatory (pass/fail) component and attendance is compulsory. The attendance and academic progress requirements in each study period (satisfactory attendance for all students is defined as maintaining at least a 85% attendance record).

ASSESSMENT OVERVIEW

Assessment Task	Weighting
1. Midterm Exam-1	**:15%**
2. Midterm Exam-2	**:15%**
3. Quizzes	**:5%**
4. Assignments/Report/Seminar	**:5%**
5. Lab	**:20%**
6. Final Exam	**40%**

This is a graded course: your overall grade will be calculated from the marks or grades for each assessment task, based on the relative weightings shown in the table above. You must obtain an overall mark for the course of at least 60%, or an overall grade of 'pass' in order to pass the course. If any 'pass/fail' tasks are shown in the table above they must also be completed successfully ('pass' grade). You must also meet any minimum mark requirements specified for a particular assessment task, as detailed in the 'assessment task' section (note that in some instances, the minimum mark for a task may be greater than 60%). Consult the University's Grades and Results Procedures for more details of interim results and final grades.

MAJMAAH University Policies

All University policies are available on the WEBPortal (mu.edu.sa) .

You may wish to view these policies:

- Assessment of Coursework Procedures
- Grads and Results Procedure
- Review ox Grade Policy
- Plagiarism Procedure
- Student Misconduct and Plagiarism Policy
- Monitoring Academic Progress Policy
- Monitoring Academic Progress Policy
- Monitoring Academic Progress Procedures
- Refund Excess Payments (Credit Balances) Policy
- Student complaints Policy
- Use of Internet, mail and Computing Facilities Policy

This list is not an exhaustive list of all University policies. The full lists of University policies are available on the http:/mu.edu.sa

Course Learning Outcomes

Upon successful completion of the course, students should be able to:

1. Student can gain the knowledge of the basic concepts of Electricity and Magnetism
2. Student can understand the concepts and principles of Electricity and Magnetism through lectures, laboratory experiments and assessment tools.
3. Student can able to apply the basic principles of physics in solving problems in a structured process.
4. Student can able to analyze the physical problem and can express it in a mathematical equation.
5. Student gains an ability to conduct and work with standard instruments and can able to design the electrical circuits.

Alignment of Learning outcomes, Assessment and Graduate attributes

ALLIGNMENT OF ASSESSMENT TASKS TO LEARNING OUTCOMES

Assessment Task	Learning Outcomes				
	1	2	3	4	5
1. Midterm Exam-1	.	.	-		
2. Midterm Exam-2	.	.	.	.	.
3. Quizzes	.	.	.	.	.
4. Assignments/Report/Seminar	.	.	.	.	.
5. Lab Exam	.	.	.	.	.
6. Final Exam	.	.	.	.	.

Textbook and Resources

PRESCRIBED TEXTBOOKS

Guide to Firewalls 7 VPN			
Author/s	: Serway and Jewett	Year	: 2012
Edition	: 7th Eidition (Chapters x, x, 6, and 7 only)	Thomson Brooks	: Cengage Learning
City	: Boston	State	:MA
Country	:USA		

IT RESOURCES

You will need access to the following IT resources:

- CSIS, Majmaah University Student Email
- Internet
- Course Website (Moodle)

Referencing style

All submissions for this course must use the **American Psychological Association (APA)** referencing style (details can be obtained here) OR **Harvard (author-date)** referencing style (details can be obtained here). For further information, see the Assessment Tasks below.

Teaching Contacts

Course Coordinator:	Dr .D. Baba Basha
Lab/Tutorial Instructor:	-
Email:	b.dudekula@mu.edu.sa
Office Hours:	8.00 a.m. to 02.30 p.m.
Office Number:	0164045386

Schedule

Week	Module/Topic	Chapter	Event and submission
Week-1	Introduction to Electricity and magnetism	Electric fields	Brain storming and review of previous knowledge.
Week-2	Electric flux, Gauss's Law (statement, equation and problems)	Gauss's Law	
Week-3	Electric Potential and potential difference, potential difference in a uniform Electric field	Electric potential	Quiz 1
Week-4	Solution to the problems	Electric Potential Applications	
Week-5	Definition of Capacitance, calculation of capacitance, combinations of capacitors, capacitors with dielectrics	Capacitance and dielectrics	Assignment 1
Vacation week			
Week-6			**Written Assessment Due Sunday (16 March 2014) 10:00 PM**

Week-7	Electric current, Resistance, ohms law, Electric power and electrical energy	Currents and resistance	
Week-8	Electromotive force, Resistors in series and parallel, Kirchhoff's Rules	Direct current circuits	First Midterm Test
Week-9	Magnetic fields and forces, Motion of charged particle in a magnetic field,	Magnetic fields	
Week-10	The Biot-Savart Law, Amperes Law	Sources of magnetic field	Quiz2
Week-11			**Written Assessment Due Sunday (20 April 2014) 10:00 AM**
Week-12	Faraday's Law of induction(statement, equation and problems),	Faraday's law	Second Midterm Test
Week-13	Self-induction and inductance,RL circuits, Mutual inductance, RLC Circuit	Inductance	Assignment 2
Week-14	The RLC series circuit (a resistor, an inductor, and a capacitor connected in series and parallel), power in an A.C. circuit, resonance in RLC services circuit.	Alternating current circuits	
Review Exam Week			Final Examination
Exam Week			Final Examination

Assessment Task

WRITTEN ASSESMENT

Assessment Title	Midterm Exam-1
Task Description	**1.** This assignment is aligned to learning outcomes 1, 2, 3 and 5. In that regard, the assignment contains questions that assess: The student knowledge on the basic concepts and principles of physics in particular electricity and Magnetism. **2.** Students should be familiar with Coulomb's law and they should be able to calculate forces between static

	charges **3.** They should understand the concept of the electric field and they should be able to calculate electric fields from given charge distributions. **4.** Students should understand the physical information contained in Gauss's law and they should be able to apply this law to the calculation of field distributions in systems with specified symmetry. **5.** They should be able to calculate the work done when a charge is moved in an electric field and connection that this has with electrostatic potential. **6.** Students should be able to find the electric field for a system when the electrostatic potential is specified. **7.** Students should be familiar with the concept of a capacitor and its capacitance. **8.** They should understand the idea of regarding an electric field as containing energy. They should be able to calculate that electrical energy and power of electrical circuits in simple cases The complete details of the assessment task are provided in Module.
Assessment Due Date	**Week 6 Sunday (16 March 2014)10 :00 AM**
Return Date to Students	Week 8 Thursday (02-Jan-201x)
Weighting	15%
Assessment Criteria	The assessment criteria for this task are under continuous revision. Please refer to Moodle for an up-to-date and complete set ox assessment criteria for this task.
Referencing Style	American Psychological Association (APA) or Harvard (author-date)
Submission	Online Submission instructions are provided in Moudle.
Learning Outcomes Assessed	**1.** Gain the knowledge of the basic concepts of Electricity and Magnetism **2.** Understand the concepts and principles of Electricity and Magnetism through lectures, laboratory experiments and assessment tools.

	3. Apply the basic principles of physics in solving problems in a structured process. 5. Gains an ability to conduct and work with standard instruments and can able to design the electrical circuits.

WRITTEN ASSESMENT

Assessment Title	Midterm Exam-2
Task Description	1. This assignment is aligned to learning outcomes 1, 2, 3, 4 and 5. In that regard, the assignment contains questions that assess: The student knowledge on the basic concepts and principles of physics in particular electricity and Magnetism. 2. Students should be familiar with the definition of electric current and electric current density. 3. They should understand the physical origin of the electrical conductivity of metals and the collision model for Ohm's law. 4. They should be able to relate resistivity to power dissipation. 5. Students should understand the physical origin of Kirchhoff's two circuit laws and be able to use them in solving circuit network problems 6. Students should be familiar with the Biot-Savart law and be able to calculate the magnetic field and magnetic forces in flowing currents. 7. They should understand the concept of the magnetic field and be able to calculate this from given current distributions. 8. Students should be familiar with the Lorentz force formula and the should be able to use it in calculating the force on a charged particle in an electric and magnetic fields. 9. Students should understand how Ampere's law arises

	as a consequence of the Biot-savart law. 10. Students should know about the divergence and the curl of the magnetic field. 11. Students should be familiar with the static properties of electric and magnetic fields. 12. They should understand Faraday's law of electromagnetic induction and how it relates to the curl of the electric field. 13. They should be able to design Resonance Circuits The complete details of the assessment task are provided in Module.
Assessment Due Date	**Week 11**
Return Date to Students	Week 13
Weighting	15%
Assessment Criteria	The assessment criteria for this task are under continuous revision. Please refer to Moodle for an up-to-date and complete set ox assessment criteria for this task.
Referencing Style	American Psychological Association (APA) or Harvard (author-date)
Submission	Online Submission instructions are provided in Module.
Learning Outcomes Assessed	1. Gain the knowledge of the basic concepts of Electricity and Magnetism 2. Understand the concepts and principles of Electricity and Magnetism through lectures, laboratory experiments and assessment tools. 3. Apply the basic principles of physics in solving problems in a structured process. 4. Analyze the physical problem and can express it in a mathematical equation. 5. Student gains an ability to conduct and work with standard instruments and can able to design the electrical resonance circuits.

FINAL EXAMINATION

Outline	Complete an examination
Date	**During University examination period**
Weighting	**40%**
Length	180 Minutes
Details	Dictionary - non-electronic, concise, direct translation only (dictionary must not contain any notes or comments) No Calculator Permitted Closed Books
Learning Outcomes Assessed	1. Student can gain the knowledge of the basic concepts of Electricity and Magnetism 2. Student can understand the concepts and principles of Electricity and Magnetism through lectures, laboratory experiments and assessment tools. 3. Student can able to apply the basic principles of physics in solving problems in a structured process. 4. Student can able to analyze the physical problem and can express it in a mathematical equation. 5. Student gains an ability to conduct and work with standard instruments and can able to design the A.C & D.C electrical circuits.