|  |  |  |
| --- | --- | --- |
|  | **Mutah University**  **Departmentof Physics**  **General Physics (2)** | Description: C:\Users\lamasat.lamasat-PC\Pictures\Picture1.png |

**Course Information:**

|  |  |
| --- | --- |
| Course Number:0302102 | Course Title:General Physics (2) |
| Credit Hours:3 hours | College:Science |
| Pre-requisite:Physics 101 | Department: Physics |
| Instructor:  Dr. Moaz Altarawneh | Semester&AcademicYear:  Spring 2017/2018 |
| The time of the lecture: | Office Hours:Sun, Tues, Thursday : 11-12 Mon, Wed: 8-11 |

**General CourseDescription**

|  |
| --- |
| This course covers the following topics: Electric Field, Gauss’s Law, Electric Potential, Capacitors and Dielectric, Current and Resistance, DC Circuits, Magnetic Field, Sources of Magnetic Field, Electromagnetic Induction and Faraday’s Law. |

**Course Objectives**

* To provide an in-depth understanding of the basic laws governing electrical phenomena and a brief survey of 20th century physics.
* To introduce students to the use of scaling arguments, dimensional analysis and simplification/approximation for physical science problem solving.
* To ensure facility with the relevant subset of topics on the MCAT.
* To provide practical knowledge of the fundamentals of instrumentation and techniques used in the biological and medical sciences.

**Expected Learning Outcomes**

* Students should have a basic understanding of electricity, including electric circuits, magnetism.
* Conceptual understanding: You should be able to answer conceptual questions which require a solid understanding of electrical and magnetic forces. You should be able to apply the concepts of electric fields and electric potential to relevant problems. You should be able to apply the concepts of magnetic fields to relevant problems.
* Application of basics laws of physics: You should be able to apply the laws of physics to formulate a solution to a problem.
* Analysis of electric circuits: You should be able to analyze electric circuits and predict their function.

**CoursePlanDistribution& Learning Resources**

|  |  |  |
| --- | --- | --- |
| **Course Content** | | |
| **Week** | **Topics** | **Chapter in Text** |
| 1+2 | ***Electric Fields***  Properties of Electric charges, Charging objects by induction, Coulomb’s law, the electric field , electric field of a continuous charge distribution, electric field lines, electric fields and conductors, motion of charged particles in a uniform electric field. | Chapter 23 |
| 3+4 | ***Gauss’s Law***  Electric flux, Gauss’s law, applications of Gauss’s law. | Chapter 24 |
| 5+6 | ***Electric Potential***  Electric potential energy and potential difference, relation between electric potential and electric field, electric potential due to point charges, potential due to continuous charge distribution, equipotential surfaces, obtaining electric field from electric potential, electrostatic potential energy. | Chapter 25 |
| 7+8 | ***Capacitance and Dielectrics***  Capacitors, determination of capacitance, capacitors in series and parallel, electric energy storage, dielectrics | Chapter 26 |
| 8+9 | ***Current and Resistance***  The electric battery, electric current, Ohm’s law, resistivity, electric power, drift velocity | Chapter 27 |
| 10+11 | ***Direct current Circuits***  EMF and terminal voltage, resistors in series and parallel, Kirchhoff’s rules, series and parallel EMFs, RC circuits. | Chapter 28 |
| 12+13 | ***Magnetic Fields***  Magnets and the magnetic fields, electric currents produce magnetic fields, force on electric current in magnetic field, force on electric charge in magnetic field, torque on a current loop, discovery and properties of the electron, the Hall effect, mass spectroscopy. | Chapter 29 |
| 14+15 | ***Sources of Magnetic Field***  Magnetic field due to straight wire, forces between two parallel wires, Ampère’s law, the magnetic field of a solenoid and a toroid, Biot-Savart law. | Chapter 30 |
| 16 | ***Faraday’s Law***  Induced EMF, Faraday’s law of induction; Len’s law, EMF induced in moving conductor, a changing magnetic flux produces an electric field. | Chapter 31 |

Teaching Strategies and Methods

|  |  |
| --- | --- |
| **Teaching Strategies and Methods** | No |
| Normal lecturing methods using white board | **1** |
| Demonstrations drawn in the white board | **2** |

Methodsof Assessment

|  |  |  |  |
| --- | --- | --- | --- |
| **Proportion of Final Evaluation** | **Evaluation Methods of** | **Week & Date** | **No.** |
| **25%** | First Exam |  | **1.** |
| **25%** | Second Exam |  | **2.** |
| **50%** | Final Exam |  | **3.** |
| **(100%)** |  | **Total** | |

**Required Textbooks**

**- Primary Textbook:**

***Physics for Scientists & Engineers with Modern Physics***

**Raymond A. Serway and John W. Jewett, 6th Ed., 2004.**

**-Secondary References**

* D. Halliday, R. Resnick, J. Walker / ***Fundamentals of Physics*** / John Wiley & Sons, 5th Ed., 1991.
* F. W. Sears, M. W. Zemansky, H. D. Young / ***University Physics***/ Addison-Wesley Publishing Company; 7th Ed., 1987.

|  |  |
| --- | --- |
| **Additional Notes** | |
| **Exams** | All the exams are multiple choice exams  The final exam is a comprehensive exam. |
| **Cheating** | Cheating is prohibited  According to the regulations of the university, there is a punishment to any student tries to cheat in the exam. |
| **Attendance** | Any student misses more than 10% of the lectures without accepted excuse will fail the course. |