

Basic Principles of Physics - Course Syllabus

Course Number: MSE 100

Course Title: Basic Principles of Physics

Academic Semester: Spring

Academic Year:

2015/ 2016

Semester Start Date: Jan, 24, 2016

Semester End Date:

May, 19, 2016

Class Schedule: 10:30 am-13:30pm, Sundays

Classroom Number:

Instructor(s) Name(s):

Xixiang Zhang

Email:

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Teaching Assistant name:

Email:

Office Location: Rm2218, building 3

Office Hours: 8:00am-18:00pm

COURSE DESCRIPTION FROM PROGRAM GUIDE

This course is a review of physics content normally taught at the senior undergraduate level. The course will cover electric field and potential, DC and AC current circuits, magnetism, magnetic induction, electromagnetic waves, and optical phenomena (transmission, reflection, diffraction, interference, etc). Further topics will include Blackbody radiation, photoelectric effect, atomic line spectra, Bohr hydrogen atom, de Broglie waves, Heisenberg Uncertainty Principle, free particle, particle in a box, particle on a ring, simple harmonic oscillation, quantum numbers, and angular momentum. Finally, an overview of the first, second, and third laws of Thermodynamics along with heat capacity, enthalpy, thermal conduction is presented.

COMPREHENSIVE COURSE DESCRIPTION

This remedy course has been designed for the students that do not have enough knowledge in Physics for their Master and Ph.D courses and researches. Based on the research spectrum of the faculties, electromagnetism, optics and modern physics are essential and critical to all students. Consider the background of the students, e.g. some students have not taken any physics course at university level and even at high school level, we cannot cover all the topics that should be taught at university level.

GOALS AND OBJECTIVES

In this course, the students will be expected to understand fundamental knowledge described in the following;

1. Understand the Electric Charge and Electric Field, Gauss's Law, Electric Potential, Capacitance, Current and Resistance
2. Understand Magnetic Field and Magnetic Forces, Sources of Magnetic Field, Electromagnetic Induction and Inductance
3. Understand Electromagnetic Waves, Interference and Diffraction
4. Understand Photons: Light Waves Behaving as Particles, Particles Behaving as Waves, wave function, Schrödinger Equation for 1D, Quantum tunnelling

REQUIRED KNOWLEDGE

1. High School Physics
2. Basic knowledge of university math, for example, AMCS 152&153

REFERENCE TEXTS

Sears and Zemansky's University Physics" 13th version

METHOD OF EVALUATION

Percentages %	Graded content (Assignments, Oral quizzes, Projects, Midterm exam, Final Exam, Attendance and participation, etc)
20%	Homework's
40%	Quizzes
40%	Final examination

COURSE REQUIREMENTS

Assignments

Assignments are the problems related to the course. The students should solve the problems and submit the homework after 10 weekdays.

Course Policies

If the student is absent more than 15% of the classes, he will be disqualified for the final exam.

NOTE

The instructor reserves the right to make changes to this syllabus as necessary.