

MODERN PHYSICS (402261) SYLLABUS -SPRING 2017-2018

Instructor: Dr. Ahmed Fawaz Al-Jamel

Class Time: 12:30-14:00 (Sun, Tue)

Office Hours: TBA

Course Homepage: TBA

Prerequisites: General Physics II

1. Text Book & References

Text Book	References
<i>Arthur Beiser, Concepts of Modern Physics, McGraw-Hill, sixth edition, ISBN 0-07-244848-2.</i>	Stephen T. Thornton and Andrew Rex, Modern Physics for Scientists and Engineers, ISBN-13: 978-1-133-10372-1.

2. Course Description

Relativity, The Particle Nature of Light, Blackbody Radiation, Planck's Radiation Law, Compton Effect, Wave Character of Matter, de Broglie Postulate, X-Ray Diffraction by Crystals, Particle Diffraction, The Atomic Structure, Atomic Models, Introductory Quantum Mechanics: Schrodinger's Equation, Simple Applications, Particle in a box, Hydrogen atom.

3. Course Learning Outcomes: At the end of this course, students are able to:

CO1	Recognize the special relativity postulates.
CO2	Apply special relativity on prototype problems that include time-dilation, length contraction, simultaneity, relativistic momentum, relativistic energy etc.
CO3	Outline the most important experimental foundation of the quantum world.
CO4	Recognize the particle-wave dual nature.
CO5	Use the Bohr postulates to find the energy spectra of H-like atoms.
CO6	Perform quantum mechanical calculations for simple systems (particle in a box)

4. Assessment Policy

First Exam	Tue. February 27, 2018	25%
Second Exam	Tue. April 10, 2018	25%
HW, Quizzes etc.	*****	***
Final Exam	TBA	50%

5. Attendance Policy

In order to pass the course successfully, you must make an effort to learn. This means that regular attendance in all parts of the course is necessary. Excusable absences require documentation. Students who arrive late disturb the class, so please be on time.

6. Weekly Teaching & Assessment Plan

Week No	Topic (As in the textbook)	Course Outcome
1+2+3	Chapter 1: Relativity	CO1+CO2
4+5+6	Chapter 2: Particle Properties of Waves	CO3+ CO4
7+8+9	Chapter 3: Waves Properties of Particle	CO3+ CO4
10+11+12	Chapter 4: Atomic Structure	CO3+CO5
13+14+15	Chapter 5: Quantum Mechanics	CO6
16	Revision (The Hydrogen atom will be presented within the framework of QM if time permits)	CO6