KING FAHD UNIVERSITY OF PETROLEUM AND MINERALS
DEPARTMENT OF PHYSICS

Physics 212 – Modern Physics - Spring Session 2002 - 2003 (Term 022)
Course Schedule and Grading Policy

Instructor	**:**	Dr. Abdelkarim Mekki	**Office**	**:**	6/117	
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Office Hours	**:**	S.M.W. 10:00 to 10:50 am or by appointment	Room 6/117 (my office)
Lectures	**:**	S.M.W. 11.00-11.50	Room 6/
Laboratory	**:**	M. 2.10-5.10	Room 6/239

Course Description: An introductory course in Modern Physics. Topics covered include: Special Relativity; the Nuclear Atom; Electromagnetic Radiation; Bohr's Theory of theA atom; the Wave Nature of Matter; Quantum Mechanics in One and Three Dimensions; Atomic X-ray Spectra; selected topics in Atomic, Nuclear, and Solid State Physics.

Pre-requisites: PHYS 102 General Physics II
MATH 102 Calculus II

Textbook : "Modern Physics", by R. A. Serway, C. J. Moses and C. A. Moyer, 2nd Ed., Saunders College Publishing (1997).

References : 1) A. Baiser, " Modern Physics, McGraw-Hill, NY (1981).
2) H. C. Ohanian, "Modern Physics", Prentice-Hall (1987).
4) R. T. Weinder and R. L. Sells, " Elementary Modern Phyics", 2nd Ed., Allyn and Bacon Inc., Boston (1973).

Goals : To introduce the students to the basic concepts of the major theories of the 20th century, namely the special theory of relativity and quantum mechanics and to discuss some selected topics in atomic, solid state, nuclear and particle physics.

Grading Policy : The course grade will be evaluated as follows:

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Homework	**15%**
Laboratory	**15%**
Exam 1	**15%**
Exam 2	**15%**
Exam 3	**15%**
Final exam	**25%**
Total	100%

Laboratory work
The lab work score will be based on any or a combination of the lab reports and lab quizzes. **Lab sessions will start on the second week of the classes.**

Exams Schedule
All exams will be of **problem solving type**. The exams are scheduled as follows:

Exam 1	**Saturday 29 March 2002**	**(Chapters 1, 2)**
Exam 2	**Monday 21 April 2003**	**(Chapters 3, 4)**
Exam 3	**Saturday 17 May 2003**	**(Chapters 5, 7)**
Final Exam	**TBA**	**(Comprehensive)**

Policy on make-up exams
If you miss a major or the final exam, you should come and **see me** with your official excuse **within three days** after the exam. Personal excuses are not allowed. If you miss the exam without a valid excuse, you get a **ZERO** score for that exam

Attendance: Attendance will be **enforced and evaluated** according to current university regulations. A **DN** grade will be given to any student exceeding 9 absences without official excuses and/or three absences in laboratory experiments. **Any student in possession of an excuse for officially authorized absence must present this excuse to his instructor no later than one week following his resumption of class attendance**

Web page

The course web page will provide key information during the semester. It will give the homework assignment, their due date and solution. The exams, homework, and lab grades will be published on the web site on regular basis. Any scheduling information that will change during the semester or important announcement will be posted on the web site. Students are urged to check the web site as often as possible.

Physics 212 Lecture Schedule Spring 2003 (Term 022)

Week	Date	Topics	Chap.	Sect.
1	24 Feb.	Overview; The Principle of Relativity	1	1, 2
	26	The Michelson-Morley experiment	1	3
2	01 Mar.	Postulates of Special Relativity and Its Consequences	1	4, 5
		Applet	**applet**	
	03	The Lorentz Transformation	1	5, 6
	05	Relativistic Momentum and Newton's Laws	1	7
Saturday – 08 March. 2003 - Last day for dropping courses without Grade of W				
3		Relativistic Mechanics	1	8 - 10
	08	http://hyperphysics.phy-astr.gsu.edu/hbase/grexp.html#c1		
	10	Electromagnetic Waves	2	1, 2
		Applet	**applet**	
	12	Blackbody radiation	2	2, 3
		Applet1 , Applet2	**applet**	
4	15	Plank's Law and Rayleigh-Jeans Law	2	3, 4
	17	The Photoelectric Effect	2	4, 5
		Applet	**applet**	
	19	The Compton Effect and Particle Wave Complementarity	2	5
5	22	Atoms and Electrons – The Rutherford Model	3	1, 2
		Applet1 , Applet2 , Applet3 , Applet4	**applet**	
	24	The Bohr Atom	3	2, 3
		Applet1 , Applet2 , Applet3	**applet**	
	26	Franck-Hertz Experiment	3	3, 5
6	**29**	**Exam 1**	-	-
	31	De Broglie Waves and Davisson-Germer Experiment	4	1, 2
	02 Apr.	Applet1 , Applet2		
		Phase Velocity and Group Velocity of Waves	4	3
Wednesday – 09 April 2003 - Last day for dropping courses with grade of "W"				
7	05	The Heisenberg Uncertainty Principle	4	5
	07	Particle-Wave Duality of the Electron	4	6 - 8
		Applet1 , Applet2		
	09	The Born Probabilistic Interpretation	5	1, 2
8	12	The Schrodinger Equation for Particles	5	2, 3
		Applet		
	14	The Particle in a Box (One dimension)	5	3, 4
		The Finite square well	5	5
	16	Applet		
9	19	The Harmonic Oscillator	5	6
	21	**Exam 2**	-	-
	23	Operators and Observables in Quantum Mechanics	5	7,8
Wednesday – 30 April 2003 – Complete withdrawal with grade of "W"				
10	26	Particle in a Box (Three Dimensions)	7	1
	28	Angular Momentum	7	2, 3
	30	Space Quantization	7	3, 4
11	03 May	Hydrogen-like Atoms, Selection Rules .	7	4, 5
	05	Orbital magnetism, Zeeman Effect, Electron Spin	8	1, 2
	07	The Spin-Orbit Interaction	8	2, 3
12	10	The Exclusion Principle	8	4
	12	The Periodic Table	8	6
	14	X-ray Spectra	8	7

	17	**Exam 3**	-	-
13	19	Bonding Mechanisms	10	1
	21	Molecular Rotation and Vibration, Molecular Spectra	10	2, 3
	24	Bonding in Solids	11	1
14	26	Free-Electron Model of Metals	11	2
	28	Magnetism In Matter	12	1, 2
15	31	Type I and II Superconductors	12	3, 4
	02 June	Nuclear Physics	13	overview
	04	Particle Physics	14	overview
	TBA	**Final Exam**	-	-

Dr. A. Mekki
Phys 212-*Instructor*

XC: Chairman, Physics Department