Physics 104 course: ELECTROMAGNETISM

Text book:

Physics for Scientists and Engineers, Fourth edition, Raymond A. Serway, College Publishing ISBN 0-03-015654-8

COURSE SYLLABUS:

Chapter	Content	Sections	Examples	problems
23	Electric Field: Coulomb's Law, The Electric Field, Electric Field Lines, Motion of Charged Particles in a Uniform Electric Field.	3, 4, 6, 7	2, 3, 4, 7, 8, 13, 14	7, 9, 15, 19, 25, 47, 48
24	Gauss's Law: Electric Flux, Gauss's Law, and Application of Gauss's Law to Various	1 ,2, 3, 4	1, 4, 5, 6, 7, 8	1, 11, 15, 24,

	Charge Distributions, Conductors in Electrostatic Equilibrium.			**37, 41**
25	Electric Potential: Potential Difference and Electric Potential, Potential Differences in a Uniform Electric Field, Electric Potential and Potential Energy Due to point Charges.	1, 2, 3	2, 3, 5	3, 13, 23, 24, 27, 29
26	Capacitance and Dielectrics: Definition of Capacitance, Calculating Capacitance, Combinations of Capacitors, Energy Stored in a Charged Capacitor, and Capacitors with Dielectrics.	1, 2, 3, 4, 5	1, 4, 5, 6, 7	10, 15, 29, 31, 49, 61, 68
27	Current and Resistance: Electric Current, Resistance, Resistance and Temperature, Electric Power.	1, 2, 3, 6	1, 3, 4, 6, 9, **10, 11**	21, 22, 25, **32, 35, 49, 53, 57**
28	Direct Current Circuits: Electromotive Force, Resistors in Series and Parallel, Kirchoff's Rules, RC	**1, 2 ,3**	**1, 3, 4, 7, 8, 9**	**6, 12, 19,** 21, 31, 32,

	Circuits.			**36, 40**
29"	Magnetic Field: Magnetic Fields and Forces, Magnetic Force Acting on a Current-Carrying Conductor, Motion of a Charged Particle in a Uniform Magnetic Field, Applications Involving Charged Particle Moving in a Magnetic Field. ["Section 2: up to equation 29.3 *Example 29.3 is replaced by problem 29.13 "Section 4: up to equation 29.14 *Section 5: up to equation 29.16]	1, 2, 4, 5	1, 2, 4, 5	5, 9, 14, 29, **35, 39**
30	Sources of the Magnetic Field: The Biot-Savart Law, The Magnetic Force Between Two Parallel Conductors, Ampére's Law, The Magnetic Field of a Solenoid, Magnetic Flux, Gauss's Law in Magnetism. [** Section 1: Equation 30.7 only and without proof]	1, 2, 3, 4 6 7	4, 8	19, 21, 24, **37, 38, 62,** 63, 64
31	Faraday's Law:	1, 2	1, 2, 6	2, 5, 11, 18,

	Faraday's Law of Induction, Motional emf. Induced emf and Electric Fields.			21
32	Inductance: Self Inductance, RL Circuits, Energy in a Magnetic field, Mutual Inductance. [Section 3: including Fig 32.2 and equation 32.6]	1, 3	1, 2	7, 9, 16, 32, 33, 38, 69
33	Alternating Current Circuits: AC Sources, Resistors in an AC circuit, Inductors in an AC Circuit, Capacitors in an AC Circuit, The RLC Series Circuit, Power in an AC Circuit, Resonance in a Series RLC Circuit. [Section 7: up to Fig 33.14]	1, 2, 3, 4 5 6 7	1, 2, 4, 5, 6, 7, 8	3, 12, 19, 25 28, 31, 34, 38, 45

Course Evaluation:

Exam	Marks	

1^{SP} Midterm	15	
2nd Midterm	15	
Lab Experiments & Exam	30	
Final	40	
Total	100	

Dr. Mohammed Saeed Alqahtani
Email: mbalqahtani@ksu.edu.sa
Office: 2b 83