King Fahd University of petroleum and minerals Department of Physics

PHYS 505 Classical Electrodynamics I

First Semester (132)

(1) <u>Course Description:</u>

Boundary value problems in electrostatics and magnetostatics; dielectrics and magnetic media; Maxwell's equations and conservation laws; wave guides and resonators; simple radiating systems.

Prerequisite: PHYS 306

(2) <u>Text Book:</u>

Classical Electrodynamics, J.D. Jackson, (3rd Edition John Wiley & sons, Inc. 1999)

(3) <u>Reference Books</u>

- 1- "Introduction to Electrodynamics Theory", D. J. Griffiths, (3rd Edition Prentice-Hall, 1999).
- 2- "Classical Electrodynamics", J Schwinger, L L DeRaad Jr, K.A Milton, Wu-Yang Tsai, (Advanced Book Program, Perseus Books, Reading, MA 1998).
- 3- "Classical Electricity and Magnetism", W K H Panofsky and M Phillips, (2nd edition, Addison-Wesley, Reading MA 1962).
- 4- "Electricity and Magnetism" Edward M. Purcell. Berkley Physics Course –Vol. 2. (McGraw-Hill, NY 1963)
- 5- "Foundation of Electromagnetic Theory" by J. Reitz, F. Milford & R.W. Christy (3rd Edition, Addison-Wesley, 1979).
- 6- "Electromagnetic Fields & Waves" by P. Lorrain & D. Corson (2nd Edition, W.H. Freeman, 1970).
- 7- "Schaum's outline Series Theory and Problems of Electromagnetic" by J. A. Edminister (McGraw-Hill book company, 1979).

(4) **Evaluation:**

MID TERM EXAM	15%
FINAL EXAM	30%
HOMEWORK	35%
TERM-PAPER	10%
INTERACTION	10%

Physics 505 Lecture Schedule Semester (132)

Wk.	Chapter	TOPICS
#	-	
1	1	Introduction to Electrostatics (Overview of the course)
2	1	Boundary value problems in electrostatics I
3	2	Boundary value problems in electrostatics I
4	2	Boundary value problems in electrostatics II
5	3	Boundary value problems in electrostatics II
6	4	Electrostatics in Dielectric Media
7	4	Electrostatics in Dielectric Media

Midterm on Wednesday 18 Jumada-I, 1435H (19th of March) at 7.00 p.m.

8	5	Boundary value problems in magneto- statics
		Midterm Vacation
9	5	Boundary value problems in magneto- statics
10	5	Boundary value problems in magneto- statics
	6	Maxwell's Equations & Conservation
11		Laws
12	6	Maxwell's Equations & Conservation Laws
13	8	Wave Guides
14	8	Resonant Cavities
15	9	Radiating systems
		Final Exam (Comprehensive)

Notes:

Term paper title and abstract are due by the last class in Week-2 Term paper presentation due at the beginning of Week-12

Please visit me for consultation on term papers.

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