KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
DEPARTMENT OF ELECTRICAL ENGINEERING

EE 532

ANTENNA THEORY & APPLICATIONS

FIRST SEMESTER 081 (2008/09)

Course Instructor: Dr. Mahmoud M. Dawoud
Tel: 860-2299, Email: mmdawoud@kfupm.edu.sa

Office Location : 59/2070
Office Hours : 19:00 - 19:50 S. M.

Or by appointment.

Course Description:

EE 532 – Antenna Theory & Applications (3-0-3)

Properties and fundamentals of antennas. Polynomial representation of linear arrays. Pattern synthesis. Broadside and endfire arrays. Chebyshev array distributions. Thin linear antennas. Impedance relations. Microstrip radiators and arrays. Huygen's principle. Radiation from apertures. Slot, horn and other waveguide radiators. Reflector type antennas. Frequency independent antennas. Reciprocity theorem and receiving antennas. LF, MF, and HF antennas. TV transmitting and receiving antennas. Radar antennas. Antenna measurements

.

Prerequisite: Graduate Standing

Test Book:

"Antenna Theory: Analysis & Design" by: C. Balanis, John Wiley & Sons Inc., 2nd Ed., 1997.

Reference Books:

1.	Antenna theory	by Balanis 1st ed.	Harper& Row 1982
2.	Antenna Theory	by Stutzman & Thiele	J. Wiley, 1981
3.	Antennas	by Kraus 2nd ed.	McGraw-Hill, 1988.
4.	Antenna Theory & Design	by R.S. Elliot	Prentice-Hall, 1981

Distribution of Marks:

Attendance, assignments, and quizzes	**20 % (3 % – 7 % – 10 %)**
Two Major Examinations	**30 %**
Projects	**20 %**
Final Examination	**30 %**

Examinations:

Examination I	Monday	1 December, 2008
Examination II	Saturday	10 January, 2009

Course Breakdown

Week	Date	Lecture Topics	
1	11-15 Oct. 2008	Introduction, Antenna types, Radiation.	
2	18-22 Oct.	Fundamental parameters of antennas.	
3	25 – 29 Oct.	Radiation Integrals and auxiliary potential functions	
4	1 – 5 Nov.	Linear wire antennas. Infinitesimal, short, and finite length dipoles.	
5	8 – 12 Nov.	Linear array analysis. Uniform arrays. Scanned arrays	
6	15 – 19 Nov.	Review of linear arrays. Dolph-Chebyshev array synthesis.	
7	22 – 26 Nov.	Antenna synthesis and continuous sources. Schelkunoff's polynomial method. Fourier transform method.	
8	29 Nov.- 2 Dec.	Taylor line-source . Tapered distributions. Rectangular and circular apertures..	
Eia Al-Adha 3-13 December 2008			
9	15 - 18 Dec.	The moment method	
10	20 - 24 Dec.	Fundamentals of aperture antennas.	
11	27 - 31 Dec.	Microstrip antennas. Rectangular and circular patches. Bandwidth and efficiency.	
12	03 - 07 Jan. 2009	Microstrip arrays and feed networks..	

13	10 - 14 Jan.	Earth stations, design considerations, general configuration, antenna system, antenna mounts, LNA and HPA.	
14	17 - 21 Jan.	Null steering in phased and adaptive arrays. Complex weight, amplitude only, phase only, and element position perturbations	
15	24 - 28 Jan.	Continuation of null steering methods ..	

Current Research topics in the field of antennas can be found in the following Journals and Magazines:

1. IEEE Trans. On Antennas & Propagation.
2. IEE Proceedings, Part H., Microwaves, Antennas & Propagation
3. Electronics Letters.
4. IEEE Antennas & Propagation Magazine.