EE 483/L 583/L Antennas for Wireless Communications
Spring 2018, 3-1 (4 credit hours)

Final Exam Room & Time: EP 255 from 10 - 11:50 am Monday, April 30, 2018

Text: *Antenna Theory*: *Analysis and Design* (Fourth Edition), Balanis, 2016

Chapter 2 Fundamental Parameters of Antennas

- radiation pattern(s)
- power density/Poynting vector
- radiation intensity
- beamwidth, i.e., half-power beamwidth (HPBW) and first null beamwidth (FNBW)
- directivity & gain
- bandwidth
- polarization
- input impedance, reflection coefficient, & VSWR
- radiation resistance and loss resistance
- antenna efficiency
- vector effective length & effective area
- Friis transmission & radar range equations

Chapter 3 Radiation Integrals & Aux. Potential Functions

- Calculate the electric and magnetic fields from $\bar{A}$ or $\bar{F}$.
- Calculate the far-field electric and magnetic fields from $\bar{A}$ or $\bar{F}$.

Chapter 4 Linear Wire Antennas

- infinitesimal dipoles
- small dipoles
- finite length dipole
- half-wavelength dipole
- monopoles
- region separation

Chapter 5 Loop Antennas

- small circular loop
- circular loop w/ constant current
- circular loop w/ nonuniform current

Chapter 6 Arrays

- Be able to design/analyze linear arrays with uniform amplitude & spacing and linear progressive phase shift

Folded Dipoles - Chapter 9.5 & notes

- Be able to analyze/design a folded dipole

Matching Techniques - Chapter 9.7 & notes

- Be able to analyze/design a T-Match and Modified Gamma match

Helical Antennas - Chapter 10.3.1 & notes

- Be able to analyze/design a normal mode helical antenna
- Be able to analyze/design an axial mode helical antenna

Yagi-Uda arrays - Chapter 10.3.3 & notes

- Be able to design a standard Yagi-Uda antenna

Log-periodic dipole arrays (LPDA)- Chapter 11.4 & notes

- Be able to design an LPDA

Chapter 14 Microstrip Antennas

- Be able to analyze/design a rectangular microstrip patch antenna