Textbook:
Lecture notes and handouts
Antenna Theory Analysis and Design, C.A. Balanis (not required)

Additional References:
Antennas, J. Kraus,
Antenna Theory and Design, Stutzman and Thiele 3rd ed
Microstrip and Printed Antenna Design, By Randy Bancroft
Microwave Engineering, D. Pozar (EE572)

Computer Software: Ansys Electronics Desktop (EE Remote Access, or on your PC)

Course Outline: This course covers the analysis and design of antennas which are used in modern communication devices. Students will be exposed to antenna design methods and measurement techniques.

Course Objectives
- Increase understanding of key antenna concepts and important parameters.
- Become familiar with various antenna types, including microstrip and printed antennas.
- Gain experience with antenna design and simulation using Ansys ED.
- Become familiar with antenna measurement techniques.

Course Topics (continues on next page)
1. Introduction to antennas
   a. Definitions and radiation patterns
2. Review of transmission line (TL) and cavity resonators
3. Introduction to microstrip antennas (MSA)
4. Circularly polarized MSA
5. Broadband and dual-band MSA
6. Array antennas and feeding network
7. Inverted-F antennas
8. Meanderline dipole and monopole antennas
9. Tapered slot antennas
10. Printed Yagi and bowtie antennas
11. Far- and near-field antenna measurement techniques

Homework
Several antenna design projects will be assigned as homework:

1. Simple probe-fed MSA design and simulations  Requires ED, Assigned, Due
2. Microwave matching circuit design  Requires ED
3. MSA matching circuit design  Requires ED
4. Covered MSA design  Requires ED
5. 1x4 Series array antenna design  Requires ED

All homework reports must be prepared individually. However, collaboration and discussion with other students is highly encouraged.

Final Project: 4x3 Series-Parallel MSA Array  Requires ED

Lab Assignment: TBD
Antenna measurements (Demo)

Grading Policy
Homework  50%
Final Project  30%
Class Attendance  15%
Class Participation  5%

Ansys Electronics Desktop (ED) on EE Remote Server
  Circuit simulations (MultiSIM type model), fast
  EM 2D simulations (Method of Moment, MoM), somewhat slow
  EM 3D simulations (Finite Element Method, FEM), can be very slow