

# **SAMPLE SYLLABUS**

This syllabus is to be used as a guideline only. The information provided is a summary of topics to be covered in the class. Information contained in this document such as assignments, grading scales, due dates, office hours, required books and materials may be from a previous semester and are subject to change. Please refer to your instructor for the most recent version of the syllabus.

## ABET Course Syllabus EEE443

1. **Course: EEE 443 Antennas for Wireless Communications**
2. **Credits and Contact Hours:** 3 Credit Hours (lecture), Topics: Engineering
3. **Course Coordinator:** Dr. James T. Aberle, Associate Professor
4. **Textbook:** C.A. Balanis, *Antenna Theory: Analysis and Design*, 3<sup>rd</sup> Edition 2005, John Wiley and Sons ISBN:1997 047166782-X.  
**Supplemental materials:** W.L. Stutzman and G.A. Thiele, *Antenna Theory and Design*, John Wiley and Sons, 1981. R.S. Elliott, *Antenna Theory and Design*, Prentice-Hall, 1981. J.D. Kraus, *Antennas*, McGraw-Hill, 1988.
5. **Specific course information**
  - a. **Catalog description:** Fundamental parameters; radiation integrals; wireless systems; wire, loop, and microstrip antennas; antenna arrays; smart antennas; ground effects; multipath.
  - b. **Prerequisites or co-requisites:** EEE 341.
  - c. **Required/elective/selected elective:** Elective
6. **Specific goals for the course**

Students learn the fundamentals of antenna analysis and design, and also be able to converse with other engineers on this topic

  - a. **Outcomes of instruction:**
    1. Students will learn the fundamentals of antenna analysis design, and measurements
    2. Students will be able to converse with technologists of the same field
    3. Students will be able to integrate antenna technology with overall communication system design and performance
  - b. **Outcomes of Criterion 3 addressed by the course:**

(1) Mathematics, Physics, and Engineering principles used to present the course material. Students learn how a critical component of modern wireless communications systems works, and how to design antennas for certain specific applications that meet economic and other constraints. They use of current simulation software and techniques to solve problems.
7. **Brief list of topics to be covered**
  1. Fundamental parameters, definitions, and antenna applications (12 classes)
  2. Vector potentials, radiation integrals, and antenna theorems (3 classes)
  3. Wire antennas and ground effects (8 classes)
  4. Loop antennas and ground effects (4 classes)
  5. Arrays and synthesis models; linear, planar, and circular (12 classes)
  6. Measurements (3 classes)

### Computer Usage:

Three homework assignments, one each in topics 1, 3, and 5, are required.

**Laboratory Experiments:** None.

### Course Contribution to Engineering Science and Design:

Student learn to apply integral equations derived using Maxwell's equations to radiating structures with solutions ranging from simple assumed current distributions to potentially exact numerical solutions. Students learn to design antennas with specific radiation characteristics and how to realize matching networks for these antennas.

Person preparing this description and date of preparation: James Aberle, K. Tsakalis, June, 2021.