

## **EEL4461C - Antennas**

Three Credits, Two hours and forty-minutes, Engineering Topic.

**Instructor:** Dr. Stavros Georgakopoulos.

**Textbook:** C. A. Balanis Antenna Theory, 4th Edition: Analysis and Design Wiley, 2016 ISBN: 978-1-118-64206-1

### **Specific Course Information:**

The goal of the course is to teach practical design of antennas for wireless communication systems using analytical and simulation models.

### **Specific Goals for the Course**

#### **a. Specific outcomes of instruction**

Upon successful completion of this course, the student will:

1. Be able to understand fundamental antenna and wireless communications principles
2. Be able to acquire knowledge of practical antenna design geared specifically toward wireless communications systems
3. Be able to perform analysis and design of antennas using state-of-the-art electromagnetic (EM) simulation software
4. Be able to understand in up-to-date challenges of antenna design for wireless communications through a design project.

**b. Explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.**

In this course the student will have to show

- (a) an ability to apply knowledge of mathematics, science, and engineering (N/A)
- (b) an ability to design and conduct experiments (simulations), as well as to analyze, interpret data (N/A)
- (c) an ability to design a system, component, or process to meet desired needs (N/A)
- (d) an ability to function in multi-disciplinary teams (N/A)
- (e) an ability to identify, formulate, and solve engineering problems (homework) (N/A)
- (f) an understanding of professional and ethical responsibility (N/A)
- (g) an ability to communicate effectively (through project reports) (N/A)
- (h) the broad education necessary to understand the impact of engineering solutions in a global and societal context (N/A)
- (i) a recognition of the need, and an ability to engage in life-long learning (N/A)
- (j) a knowledge of contemporary issues (N/A)
- (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice (N/A)
- (l) a knowledge of probability and statistics (N/A)

### **Brief list of the topics to be covered**

1. Basic principles of wireless communications
2. Antenna principles
3. Wire antennas
4. Printed antennas

5. Antenna arrays

**GRADING:**

Course Requirements	Weight
Homework	25%
Quizzes	25%
Exam 1	25%
Exam 2	10%
Final Project	15%
Simulation Modeling & Analysis Homework	25%
Overall Grade	100%

**Conversion of Numerical Grade to Letter Grade**

$95 \leq A \leq 100$	$83 \leq B < 86$	$70 \leq C < 76$
$90 \leq A- < 94$	$80 \leq B- < 82$	$60 \leq D < 69$
$87 \leq B+ < 89$	$77 \leq C+ < 79$	F: Below 60