

## **EC526- Mobile communications**

### **CREDIT HOURS**

3 Hours

### **CONTACT HOURS (Hours/week)**

Lecture: 2; Tutorial: 2

### **COURSE COORDINATOR**

Dr. Ashraf Mamdouh

### **TEXT BOOK**

William C.Y. Lee, "Mobile Communication Design Fundamentals"

### **COURSE DESCRIPTION**

Difference between conventional mobile and cellular mobile - Overview on different cellular generations - Cellular radio design principles - Concept of frequency reuse/cellular block diagram - Co channel interference/adjacent channel interference - Multipath propagation - Speech coding in GSM - Channel coding and interleaving in GSM - GSM mobile station block diagram - Multiple access techniques - Control channels in GSM - Location updating\ security management.

### **PREREQUISITE:**

EC 422

### **RELATION OF COURSE TO PROGRAM**

Elective

### **COURSE INSTRUCTION OUTCOMES**

The student will be able to:

- Understand the Fundamentals of mobile and cellular communications
- Understand the System design, cell capacity and blocking probability
- Understand the Multiple Access Techniques- channel coding in mobile communication  
Frequency Reuse – cell cluster concept.

### **TOPICS COVERED**

- Difference between conventional mobile and cellular mobile
- Channel trunkings needs and blocking probability
- Overview on different cellular generations
- Cellular radio design principles
- Concept of frequency reuse/cellular block diagram
- Co channel interference/adjacent channel interference
- Multipath propagation and mobile communication channel problems
- Speech coding in GSM
- Channel coding and interleaving in GSM

- GSM mobile station block diagram
- Multiple access techniques
- Control channels in GSM
- Location updating\ security management

**CONTRIBUTION OF COURSE TO MEET THE REQUIREMENTS OF CRITERION 5:**

<b>Professional component Content</b>			
<b>Math and Basic Sciences</b>	<b>Engineering Topics</b>	<b>General Education</b>	<b>Other</b>
	✓		

**RELATIONSHIP OF COURSE TO STUDENT OUTCOMES:**

<b>Student Outcomes</b>		<b>Course aspects</b>
A	An ability to apply knowledge of mathematics, science, and engineering	a <sub>1</sub>
B	An ability to design and conduct experiments, analyze and interpret data.	
C	An ability to design a system, component, or process to meet desired needs within realistic constraints such as economics, environmental, social, political, ethical, health, and safety, manufacturability, and sustainability	c <sub>2</sub>
D	An ability to function on multi-disciplinary teams.	
E	An ability to identify, formulate, and solve engineering problems	e <sub>3</sub>
F	An understanding of professional and ethical responsibility	f <sub>1</sub>
G	An ability to communicate effectively	
H	The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and social content	h <sub>1</sub>
I	A recognition of the need for, and an ability to engage in life-long learning.	i <sub>3</sub>
J	A knowledge of contemporary issues within and outside the electrical engineering profession.	j <sub>2</sub>
k	An ability to use the techniques, skills, and modern engineering tools necessary for electrical engineering practice.	