



## Course Specifications

Program(s) on which this course is given:	Electronics & Electrical Communications Engineering
Major or Minor element of programs:	Major
Department offering the program:	Electronics & Electrical Communications Engineering
Department offering the course:	Electronics & Electrical Communications Engineering
Academic year / Level:	Fourth
Date of original/modified specification approval:	2003
Semester of course offering:	Second Semester

## A- Basic Information

1.a. Title:	Wireless Communications Systems			1.b. Code:	ELC 449			
2. Units/Credit hours per week:	2.a. Lectures	4	2.b. Tutorial	0	2.c. Practical	0	2.d. Total	4

## B- Professional Information

1. Overall Aims of the Course:	The course aims at introducing basic concepts of wireless communication systems including, re-use figure, spectrum efficiency, capacity enhancements, interference, and TDMA frame structure. It also provides functionalities of the basic building blocks of a cellular system. The focus is on the system level as well as the design options.
2. Intended Learning Outcomes of Course (ILOs):	<b>a) Knowledge and Understanding</b>
	<ol style="list-style-type: none"> <li>1. Explain the rationale of choosing TDMA access scheme for DAMPS (1.2, 1.7).</li> <li>2. Investigate the field structure of TDMA time slot of DAMPS forward and reverse channels (1.2, 1.7).</li> <li>3. Examine and Breakdown of high level block diagram of DAMPS into its main units (1.2, 1.7).</li> <li>4. Investigate main types of interference in mobile systems, methods of reducing interference (1.2, 1.7).</li> </ol>
	<b>b) Intellectual Skills</b>
	<ol style="list-style-type: none"> <li>1. Compare field structure of TDMA time slot of DAMPS forward and reverse channels (3.4).</li> <li>2. Criticize the functionalities of each block of DAMPS (3.2, 3.4).</li> <li>3. Solve simple design problems to meet performance criteria (3.7).</li> <li>4. Assess different techniques to increase capacity and choose the best technique to fit a given application (3.2, 3.4, 3.5).</li> </ol>
	<b>c) Professional and Practical Skills</b>
	<ol style="list-style-type: none"> <li>1. Use concepts of re-use, spectrum efficiency, traffic, and trunking efficiency to measure system capacity (2.6).</li> </ol>
	<b>d) General and Transferable Skills</b>
	<ol style="list-style-type: none"> <li>1. Model simple problems related to interference, and traffic blocking using simulation tools and present results in a team (4.2, 4.7, 4.9).</li> </ol>

## 3. Contents

Topic		Total hours	Lectures	Tutorial/ Practical
1. Historical Background		4	4	0
2. Frequency Re-use and Spectrum Efficiency		10	10	0
3. Methods to increase capacity		10	10	0
4. TDMA Frame Structure		8	8	0
5. Cellular System Block Diagram		10	10	0
6. Interference		8	8	0
7. Presentation for the project		6	6	0
4. Teaching and Learning Methods	Lectures (Y)	Practical Training/ Laboratory (N)		Seminar/Workshop (N)
	Class Activity (Y)	Case Study (N)		Numerical Projects (Y)
	E-learning (Y)	Assignments /Homework (N)		Other:
5. Student Assessment Methods				
5.a. Method		To assess (with reference to the ILOs)		
- Class Quiz		a1, c1, b4, b3.		
- Project		d1.		
- Mid-term exam		a1, c1, b4, b3, a4.		
- Final Exam		a1, c1, b4, b3, a4, a3.		
5.b. Assessment Schedule		Week		
-Assessment 1; Quiz		4		
-Assessment 2; Mid-term exam		8		
- Assessment 3; Project		11		
- Assessment 4; Final Exam		15		
5.c. Weighting of Assessments				
- Quiz		5%		
- Mid-Term Examination		15 %		
- Final-term Examination		70 %		
- Semester Work (Project)		10 %		
-Total		100 %		
6. List of References				
6.a. Course Notes: <b>Hard Copies distributed</b> to all students				
6.b. Essential Books (Text Books)				
<ul style="list-style-type: none"><li>T.S. Rappaport, “Wireless Communications-Principles and Practice” Second Edition, Prentice Hall, 2009</li></ul>				
6.c. Recommended Books.				
<ul style="list-style-type: none"><li>None</li></ul>				
6.d. Periodicals, Web Sites, ... etc: N/A				
7. Facilities Required for Teaching and Learning				
<ul style="list-style-type: none"><li>Class room should be equipped with projector, 2 wireless microphones, and white board</li></ul>				
Course Coordinator:	Prof. Dr. Hazem Tawfik			
Head of Department:	Prof. Dr. Mahmoud El-Hadidi			
Date:	June, 19 <sup>th</sup> 2011			