



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:	First

A- Basic Information

1.a. Title:	Selected topics (Smart materials)			1.b. Code:				
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:	Introduces the student into the field of smart materials and applications- MEMs- molecular electronics- modern sensors- materials and properties – tactile sensor arrays – electronic nose – OLEDs and imaging systems.
2. Intended Learning Outcomes of Course (ILOs):	a) Knowledge and Understanding (1.7)
	<ol style="list-style-type: none"> 1. Recognize new developments in electronic materials making use of their properties. 2. Recognize the potential of smart materials in new applications. 3. Recognize new types of devices and new emerging technologies.
	b) Intellectual Skills
	<ol style="list-style-type: none"> 1. Initiate creative thinking for need to develop new types of sensor materials (3.2). 2. Assess applicability of smart materials in a wide range of fields (3.3, 3.4). 3. Assess state of the art research activities in smart materials field.
	c) Professional and Practical Skills
	<ol style="list-style-type: none"> 1. Design and build systems using smart materials (2.4). 2. Promote awareness and importance of materials research into the engineering community and industry (2.5). 3. Follow new developments in the fast growing field of smart electronics.
	d) General and Transferable Skills
	<ol style="list-style-type: none"> 1. Display professional ability to keep up with latest development in technology and file a technical report up to professional standard (4.7). 2. Promote group research and team work (4.7). 3. Make presentations in face of peer evaluation (4.7, 4.9).

3. Contents

Topic	Total hours	Lectures	Tutorial/ Practical
Properties of smart materials	4	4	
Types of sensors	4	4	
MEMs	6	6	
Design of microsystems	6	6	
Molecular electronics	4	4	
Organic materials - OLEDs	6	6	

Electronic nose	4	4	
Tactile sensors –touch devices	4	4	
Imaging systems	4	4	
New mass storage devices	4	4	
Tracking systems	4	4	
Commercial – medical- military applications	6	6	
4. Teaching and Learning Methods	Lectures (Y)	Practical Training/ Laboratory (N)	Seminar/Workshop (Y)
	Class Activity (Y)	Case Study (Y)	Projects (Y)
	E-learning (Y)	Assignments /Homework (Y)	Other:
5. Student Assessment Methods			
5.a. Method		To assess (with reference to the ILOs)	
- Assignment		a1,a2,a3,b1,b2,b3	
- Seminar		b1,b2,b3,d1,d2,d3	
- Project		c1, c2,c3	
- Final exam		a1,a2,a3,b1,b2,b3,c1,c2,c3	
5.b. Assessment Schedule		Week	
- Assignment		5	
- Project		12	
- Seminar		13	
- Final exam		15	
5.c. Weighting of Assessments			
Assignment		10%	
-Project and Seminar		20%	
-Final-term Examination		70%	
-Total		100 %	
6. List of References			
6.a. Course Notes			
6.b. Essential Books (Text Books):			
• Smart materials, M. Sameh Said (In process)			
6.c. Recommended Books:			
• "MEMs and Microsystems" ,Tai Ran Hsu, 2009.			
• Handbook of modern sensors, Jacob Fraden, 2007.			
6.d. Periodicals, Web Sites, ... etc:			
• Search in web sites			
7. Facilities Required for Teaching and Learning			
N/A			
Course Coordinator:	Prof. Dr. M. Sameh Said		
Head of Department:	Prof. Dr. Mahmoud El-Hadidi		
Date:	20-10-2011		

