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:	Green electronics			1.b. Code:	ELC 401 B			
2. Units/Credit hours per week:	2.a. Lectures	4	2.b. Tutorial		2.c. Practical		2.d. Total	4

B- Professional Information

1. Overall Aims of the Course:

To get an overview on environmental challenges in electronics industry- e-waste- nano-technological opportunities in pollution control – energy- fuel cells- health care- nano-materials- CNT- memory-MRAM- SET- biomedical and medical applications.

2. Intended Learning Outcomes of Course (ILOs):

a) Knowledge and Understanding (1.3, 1.5, 1.7)

1. Recognize challenges facing electronics industry to make it environment friendly.
2. Recognize new avenues opened by nano-materials.
3. Recognize innovations in electronics components and memory.
4. Recognize new ways of solving energy crises.

b) Intellectual Skills

1. Initiate creative thinking in solving environmental issues in electronics industry (3.2).
2. Applying new paradigms of nanotechnology to meet challenges of pollution, energy and health care (3.5).
3. Apply new electronic devices and memory systems (3.9).

c) Professional and Practical Skills (2.4)

1. Design systems for pollution control.
2. Design systems for hydrogen storage and fuel cells.
3. Design new electronic systems and memory structures.

d) General and Transferable Skills (4.8)

1. Display professional responsibilities and societal obligations to ensure a safe environment.
2. Promote ethical and cultural concern to build an environment friendly engineering community.

3. Contents

Topic	Total hours	Lectures	Tutorial/ Practical
Environmental challenges in electronics industry	4	4	
Reliability of green electronic systems	4	4	
Conversion to Lead free assembly	4	4	
Green materials	4	4	

Green printed board	4	4	
Green finishes of IC's	4	4	
E waste and pollution control	4	4	
Nanotechnology and nano-materials	6	6	
Buckyballs and CNTs	6	6	
Nano-electronic components and memory	6	6	
Energy challenge and fuel cells	6	6	
Nanotechnology in health care and genetics	4	4	

4. Teaching and Learning Methods	Lectures (Y)	Practical Training/ Laboratory (N)	Seminar/Workshop (N)
	Class Activity (N)	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,a4,b1,b2,b3,d1,d2
- Project	c1, c2,c3
- Final exam.	a1,a2,a3,a4,b1,b2,b3,c1,c2,c3
5.b. Assessment Schedule	**Week**
- Assignment	5
- Project	12
- Final exam	15
5.c. Weighting of Assessments	
- Assignment	10%
- Project	20%
- Final-term Examination	70%
-Total	100 %

6. List of References
6.a. Course Notes
6.b. Essential Books (Text Books):
• Nano green electronics, M. Sameh Said (In process)
6.c. Recommended Books:
• Green electronics, Sammy Shina,2010. • Tomorrow's energy, Peter Hoffman, 2010.
6.d. Periodicals, Web Sites, … etc:
• Search in web sites
7. Facilities Required for Teaching and Learning
N/A

Course Coordinator:	**Prof. Dr. Abd El-Haleem Shousha**
Head of Department:	**Prof. Dr. Mahmoud El-Hadidi**
Date:	**20-10-2011**