

## Faculty of Engineering & Technology

### Graduation Project I

**Information :**

**Course Code :** MKT 500

**Level :** Undergraduate

**Course Hours :** 2.00- Hours

**Department :** Specialization of Mechatronics Engineering

**Instructor Information :**

Title	Name	Office hours
Lecturer	Mohamed Ali Mohamed Elsayed Torad	
Lecturer	Amr Mohamed Metwally Ismaiel	
Lecturer	Hassan Mohamed Shams Eldin Elsayed Eleashy	
Lecturer	Mohamed Fathy Abdel Rahman Badran	4
Lecturer	MOHAMED ABDELBAR SHAMSELDIN ALY	5
Lecturer	Mohamed Ahmed Mahmoud Karali	
Lecturer	Abdel Moneim Mohamed El Mahdi Ismail	
Lecturer	Anas Mohamed Abdelrahman Ali	
Lecturer	SAMAH ELSAYED ELMETWALLY ELKHATIB	
Assistant Lecturer	Zakaria Mostafa Abdo Salim Marouf	
Assistant Lecturer	Moustafa Raafat Aziz Shousha	
Teaching Assistant	Amira Khaled Hasan Mohamed Elkodama	
Teaching Assistant	Mohamed Samir Ahmed Mohamed	2
Teaching Assistant	Osama Ahmed Ibrahim Mohamed Montaser	

**Area Of Study :**

- Introduce critical thinking and scientific methodology in problem solving.
- Train student to focus on problem analysis, make wide review of previous art, and evaluate previous solutions.
- Train students to design and simulate a new Mechatronics system.

**Description :**

Conceptual Design: Students follow systematic design approach, apply project planning and scheduling techniques, devise analytical, computational and/or experimental solutions, and design and build their own test-rig. Students attend technical seminars and learn to interact with speakers and at the end of the semester; they are required to present a seminar on the project status, progress and future work.

**Course outcomes :**

**a. Knowledge and Understanding: :**

1 -	a1. Demonstrate a technique for a computer aided graphical representation for the project topics considered.
2 -	a2. Tell topics related to humanitarian interests, moral issues, respect for diversity and general knowledge from other disciplines.
3 -	a3. Identify basics of information and communication technology (ICT).
4 -	a4. Describe basics of English technical language.
5 -	a5. Describe fundamentals of technical report writing considering one of the standard format.
6 -	a6. Define characteristics of engineering materials including material structure and properties.
7 -	a7. Quote principles of design including elements design, process and/or a system related to Mechatronics.
8 -	a8. Describe quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues.
9 -	a9. Describe current engineering technologies as related to Mechatronics including modern techniques in sensors, actuators, control units and their interfaces.
10 -	a10. Identify the professional ethics and impacts of engineering solutions on society and environment
11 -	a11. Describe the contemporary engineering topics.
12 -	a12. Define fundamentals of problem identification, formulation and solution in the inter-disciplinary fields of Mechatronics
13 -	a13. Describe the principles of sustainable design and development

**b. Intellectual Skills: :**

1 -	b1. Solve engineering problems, often on the basis of limited and possibly contradicting information.
2 -	b2. Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact.
3 -	b3. Incorporate economic, societal, environmental dimensions and risk management in design.
4 -	b4. Analyse results of numerical models and assess their limitations.
5 -	b5. Create systematic and methodical approaches when dealing with new and advanced technology.
6 -	b6. Design Mechanical systems considering modern techniques including modern CAD tools.
7 -	b7. Analyse electrical and electronics including logic circuits, and microprocessor based systems.
8 -	b8. Identify at an appropriate level the design, production, interfacing and software needs of different parts of Mechatronics systems.
9 -	b9. Create solutions to mechatronics systems especially to manufacturing, maintenance and interfacing problems in a creative way, taking account of industrial and commercial constraints.

**c. Professional and Practical Skills: :**

1 -	c1. Construct engineering graphics to visualize various engineering applications including computer aided drafting.
2 -	c2. Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to identify, formulate and solve engineering and field problems related to Mechatronics.
3 -	c3. Carry out specialized engineering designs for a process, component or system
4 -	c4. Apply the principles of sustainable design and development.

**d. General and Transferable Skills: :**

1 -	d1. Work in stressful environment and within constraints
2 -	d2. Communicate effectively.

3 -	d3. Demonstrate efficient IT capabilities
4 -	d4. Lead and motivate individuals
5 -	d5. Effectively manage tasks, time, and resources
6 -	d6. Search for information and engage in life-long self-learning discipline
7 -	d7. Acquire entrepreneurial skills
8 -	d8. Refer to relevant literatures

#### **Course Topic And Contents :**

Topic	No. of hours	Lecture	Tutorial / Practical
Introduction to project steps (Planning- Designing- Making- Finishing & Testing-Documentations) - Mechatronics system design process	6	0	6
Teams & project task selection.	2	0	2
Proposal with time plan	4	0	4
Literature survey of previous work - brain storming.	18	0	18
Alternative solutions evaluation	4	0	4
Design & analysis.	18	0	18
Report writing & Poster design.	4	0	4
Presentation	4	0	4

#### **Teaching And Learning Methodologies :**

Interactive Lecturing
Problem solving
Discussion ( Brain storming)
Experiential learning
Project
Collaborative Research

#### **Course Assessment :**

Methods of assessment	Relative weight %	Week No	Assess What
1st mid term	10.00	6	
2nd mid term	10.00	11	
Final Exam	40.00	16	
Oral Exam	25.00	16	
Participation and presentations	15.00		

#### **Course Notes :**

Lecture notes on the course Moodle page, FUE website

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**Recommended books :**

1. Text Book:

MIT Guide for Science and Engineering Communication, Zimmerman and Paradise, MIT press. Second edition.

2- Recommended Readings:

Critical Thinking and Innovation

Mechatronics Handbook.