

**Faculty of Engineering & Technology**

**Mechanisms Computer Aided Design**

**Information :**

**Course Code :** MAN 570

**Level :** Undergraduate

**Course Hours :** 2.00- Hours

**Department :** Specialization of Mechatronics Engineering

**Instructor Information :**

Title	Name	Office hours
Lecturer	Sherif Abdelrahman Abdelrahman Elatriby	2
Lecturer	Sherif Abdelrahman Abdelrahman Elatriby	2
Teaching Assistant	Mostafa Mahmoud Sabry Sadek	
Teaching Assistant	Osama Ahmed Ibrahim Mohamed Montaser	1
Teaching Assistant	Ali Mahmoud Alkmal Mohammed Ali	1

**Area Of Study :**

- Prepare student to understand planner mechanisms.
- Develop students' knowledge with kinematic analysis using software simulation.
- Train students to validate simulated results with conventional analytical and graphical methods.

**Description :**

Synthesis of planar and spatial mechanisms. Computer based analysis of kinematics and dynamics of mechanisms. Mechanisms simulation tools and its merits and limitations. Mini-project on modeling and simulation of a practical case. Overview of rapid and virtual prototyping software tools.

**Course outcomes :**

**a.Knowledge and Understanding: :**

1 -	Explain the basic elements of planner mechanisms.
2 -	List the different joints and kinematic pairs.
3 -	Identify the degrees of freedom and the category of common mechanisms.
4 -	Collect data to simplify and manually analyses planner mechanisms.
5 -	Interpret basic Science and simulation packages to analyses planner mechanisms.

**b.Intellectual Skills: :**

1 -	Use analytical methods to find kinematic parameters of mechanisms.
2 -	Select suitable graphical approach to find kinematic parameters of mechanisms.
3 -	Use simulation packages to solve planner mechanisms.
4 -	Solve planner mechanisms in all possible configurations.

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

1 -	Apply graphical and analytical solutions for any planner mechanisms.
2 -	Select suitable method to solve mechanisms and find kinematic parameters.
3 -	Create assembly on simulation packages to run mechanisms.
4 -	Apply analyses using commercial software.

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

1 -	Communicate effectively.
2 -	Effectively manage tasks, time, and resources.
3 -	Acquire entrepreneurial skills.

**Course Topic And Contents :**

Topic	No. of hours	Lecture	Tutorial / Practical
Introduction	2	2	0
Basics of CAD assembly and simulation	3	2	1
Main types of kinematic pairs	4	4	0
Kinematics parameter definitions	3	2	1
Kinematics analysis using graphical methods	5	4	1
Kinematics analysis using analytical methods	3	2	1
Basics of CAD assembly	3	2	1
Defining kinematic pairs on SW	5	4	1
Engineering simulation packages	3	2	1
Mathematical simulation packages	5	2	3
Validate Mathematical simulation with conventional methods	5	2	3
Validate SW with conventional methods	4	2	2

**Teaching And Learning Methodologies :**

Interactive Lecturing
Problem solving
Project
Research
Experiential learning
Project

**Course Assessment :**

Methods of assessment	Relative weight %	Week No	Assess What
Assignment	5.00		
Final Exam	40.00		
Mid- Exam 1I	15.00		

---

Mid- Exam I	15.00		
Project	10.00		
Quizzes	10.00		
Research	5.00		

**Course Notes :**

Lecture notes on the course Moodle page, FUE website.

**Recommended books :**

Text Book:

- Machines & Mechanisms: Applied Kinematic Analysis , 4th Edition, Pearson, 2011)
- GeoGebra Manual (V 2018) and SolidWorks handbook (V 2018).