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
Associate Professor	Hussein Mohamed Abdelmoneam Hussein	1
Lecturer	Ali Mostafa Abdelaty Hassibelnaby	1
Teaching Assistant	Osama Ahmed Ibrahim Mohamed Montaser	1
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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		

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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).