FUTURE UNIVERSITY IN EGYPT
جامعة المستقبل

Faculty of Engineering & Technology

Mechanical Design (2)

Information :

Course Code :	MAN 441	**Level :**	Undergraduate	**Course Hours :**	3.00- Hours

Department : Department of Mechanical Engineering

Instructor Information :

Title	Name	Office hours
Lecturer	Mohamed Ahmed Mahmoud Abdelwahab	
Teaching Assistant	Christopher Nashaat Najib Benjamin	

Area Of Study :

ÅEnrich the studentõs understanding of the design of different mechanical ele-ments.
ÅDevelop the studentõs ability to apply the different design principles on power transmission system.
ÅEnhance the studentõs ability to integrate the different design principles in a group design project where they use computer aided design software.

Description :

Design of Mechanical Elements: Gears (spur, helical, bevel and worm gears). Clutches, Brakes, Couplings, Flywheels. Design of Flexible Mechanical Elements (Belts, Chains, Flexible shafts). Mechanical springs, Power transmission, Bearings (Rolling-contact bearing, journal Bearing). Case studies, Use of interactive computer programs for problem solving, Group design project.

Course outcomes :

a.Knowledge and Understanding: :	
1 -	Understand the different types of mechanical elements such as gears, flexible mechanical elements, clutches, brakes, couplings, flywheels, springs and bearings.
2 -	Comprehend the different forces associated with the different me-chanical elements.
3 -	Understand the design principles for the different mechanical ele-ments.
4 -	Learn how to use computer aided design programs such as solid works to draft different mechanical components.
b.Intellectual Skills: :	
1 -	Analyse the forces on different mechanical elements.
2 -	Design of gear trains.
3 -	Apply the design principles on a power transmission case study.
4 -	Utilize computer aided design software such as Solidworks in a de-sign project.
c.Professional and Practical Skills: :	
1 -	Train and utilize computer aided design programs such as Solid-Works.
2 -	Select an engineering project and collect the information about its activities.

3 -	Apply design principles and procedures on an engineering design project.
d.General and Transferable Skills: :	
1 -	Work in a group project
2 -	Submit on time assignments and project.
3 -	Utilize computer aided drafting software such as Solid Works
4 -	Present the project in a technical report.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Course Outline Introduction to Mechanical Engineering Design	2	2	0
Solid Works tutorials (Drafting, and assembly)	10	0	10
Gears Types, Nomenclature, conjugate action, invo-lute properties, fundamentals, contact ratio, inter-fer-ence	2	2	0
Tooth systems and Gear trains	4	2	2
Spur gears, bevel, helical and worm gears	2	2	0
Force Analysis- Spur gearing, bevel gearing, he lical gearing and worm gearing	12	6	6
Flexible Mechanical Elements Belts (Flat, V, timing and metal)	10	4	6
Introduction to Rolling-contact bearing	2	2	0
Introduction to Journal Bearing	2	2	0
Introduction to Mechanical Springs	2	2	0
Introduction to Clutches, brakes, coupling and flywheels	2	2	0
Introduction to gear box	2	0	2
Midterm Exams	4	4	0
Project submission and oral discussion	4	0	4

Teaching And Learning Methodologies :

Interactive Lecturing
Problem solving
Experiential learning
Project

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
1 st -Mid-term	15.00	6	

2 nd -Mid-term	15.00	11	
Attendance and class participation	10.00		
Final Exam	40.00	16	
Project	10.00	14	
Quizzes	10.00		