

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	Zakaria Mostafa Abdo Salim Marouf	2
Lecturer	Ahmed Sobhi Mohamed Gad	1

Area Of Study :

- Enrich the students understanding of the design of different mechanical elements.
- Develop the students ability to apply the different design principles on power transmission system.
- Enhance the students 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 -	Explain the different types of mechanical elements such as gears, flexible mechanical elements, clutches, brakes, couplings, flywheels, springs and bearings.
2 -	Interpret the different forces associated with the different mechanical elements.
3 -	Explain the design principles for the different mechanical elements.
4 -	Illustrate the use of computer aided design programs such as solid works to draft different mechanical components.

b. Intellectual Skills: :

1 -	Analyze the forces on different mechanical elements.
2 -	Design of gear trains
3 -	Design of flexible mechanical elements
4 -	Apply the design principles on a power transmission case study.

c. Professional and Practical Skills: :

1 -	Draft mechanical elements and assemblies on CAD software such as Solid-Works.
2 -	Utilize Solid-Works software capabilities for power transmission project.

- 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
Introduction to Mechanical Engineering Design	2	2	0
Solid Works tutorials (Drafting, and assembly)	10	0	10
Gears (Spur, bevel, helical and worm gears) Fundamental, gear trains, and force analysis	12	12	0
Flexible Mechanical Elements Belts (Flat, V, timing and metal)	4	4	
Introduction to Rolling-contact bearing	2	2	0
Introduction to Journal Bearing	2	2	
Introduction to Mechanical Springs	2	2	0
Introduction to Clutches, brakes, coupling and flywheels	2	2	0
Introduction to power transmission (gearbox)	2	2	0
Project follow up and Presentation	8	2	6

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		

