

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 student's understanding of the design of different mechanical elements.
Develop the student's ability to apply the different design principles on power transmission system.
Enhance the student's 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		

