Date:	Examination No.:	Version:2022-2023	Start:1/2/2023
Module Name - Code	Mechanical Engineering Design-3135		
Module Language:	English		
Responsible:	Dr. Shirin Othman Muhammad		
Lecture (s):	Dr. Shirin Othman Muhammad		
College:	College of Engineering – Salahaddin University-Erbil		
Duration:	15 week – 1 semester		
Course outcomes:	At the end of the semester, students would be able to: 1. understand the general design procedures and principles in the design of machine elements. 2. to study different materials of construction and their properties and factors determining the selection of material for various applications. 3. To determine stresses under different loading conditions. 4. To learn the design procedure of different permanent and nonpermanent joints, shafts, couplings and gears.		
Course Content:	• Design of machine elements for simple and combined static stresses and fatigue strength. • Design shaft and couplings under static and dynamic loads. • Design of Power screws, bolted and welded joints. • Design of gears using AGMA procedure involving Lewis and Buckingham equations. • Transmission of power by Belt and Rope Drives, Transmission efficiencies, Belts – Flat and V types – Ropes - pulleys for belt and rope drives. • Apply the theoretical concepts to conduct various experiments on design of machine elements practically and analyze the data.		
Literature:	1. Shigley J.E, "Mechanical Engineering Design Budynas, R. G., & Nisbett, J. K." Mcgraw-Hill (2011) 9th edition. 2. Norton, R. L. "Machine Design: An Integrated Approach" Prentice Hall 3. Spotts, M. F., Shoup, T. E., & Hornberger, L. E. "Design of Machine Elements" Pearson /Prentice Hall 4. Hamrock, B.J. Et.Al., "Fundamentals of Machine Elements", Mcgraw Hill.		
Type of Teaching:	Two forms of teaching are generally used: power point using data-show and white board for deriving and solving problems. Students will be participated in solving problems, group discussions are allowed in lectures.		
Pre-requisites:	None		
Preparation Modules:	Students must have background about strength of materials, Fundamentals of Design and Material science.		
Frequency:	Every year		

Requirements for credit points:	For the award of credit points, it is necessary to pass the module exams. It contains: Midterm examination, Quizzes, projects and Final examination. **Student's attendance is required in all classes.** **Students with more than 10% absent records and/or student effort less than 20% are not allowed to enter the final exam.**
Credit point:	5
Grade Distribution:	The following grade system is used for the evaluation of the module exam: The module exam is based on the summation of two categories of evaluations: **First: (40%)** of the mark is based on the academic semester effort which includes - Midterm examination during the academic semester =20 %. - Assignments = (5%). - Project (15%) **Second: (60%)** of the mark is based on final examination that is comprehensive for the whole of the study materials reviewed during the academic semester.
Work load:	The workload is 135 hrs. It is the result of 60 hrs. attendance and 75 hrs. self-studies (problem solving, working on project and preparation for exam).

Week no	subjects	notes
1	introduction	
2	Material selection	
3	Failure prevention resulting from static, and dynamic loading.	
4	Design of Mechanical Elements, shaft design	
5	Design of Mechanical Elements, non-permanent joints	
6	Design of Mechanical Elements, non-permanent joints	
7	Design of Mechanical Elements, permanent joints	
8	Project 1(Discussion)	
9	Gear design (spur gear)	
10	Gear Design (bevel gear)	
11	Mid term exam	
12	Clutch brakes coupling and flywheels	
13	Project 2 Discussion	
14	Flexible mechanical elements(Belts)+ Mechanical springs	
15	Final exam	