

## Module (Course Syllabus) Catalogue 2022-2023

College/ Institute	Technology college	
Department	Automotive Technology	
Module Name	Mechanical Design I	
Module Code	MED602	
Degree	Technical Diploma <input type="checkbox"/> Bachelor <input type="checkbox"/> High Diploma <input type="checkbox"/> Master <input type="checkbox"/> PhD <input type="checkbox"/>	
Semester	Six	
Qualification		
Scientific Title		
ECTS (Credits)	3	
Module type	Prerequisite <input type="checkbox"/> Core <input type="checkbox"/> Assist. <input type="checkbox"/>	
Weekly hours		
Weekly hours (Theory)	( 2 )hr Class	( 27 )Total hrs Workload
Weekly hours (Practical)	( 2 )hr Class	( 27 )Total hrs Workload
Number of Weeks	12	
Lecturer (Theory)	Prof.Dr.Basim Mohammed Fadhil	
E-Mail & Mobile NO.	basim.fadhil@epu.edu.iq	
Lecturer (Practical)		
E-Mail & Mobile NO.		
Websites		

# Course Book

<b>Course Description</b>	This course is concerned with the study of the important mechanical elements in mechanical design, including the study of stresses as well as theories of failure. And shaft design, riveted joints, riveted joints, screwed joints,.Keys and coupling, power screws and flat belt pulleys.				
<b>Course objectives</b>	<p>The objectives of the course are to:</p> <ul style="list-style-type: none"><li>• Cover the basics of machine design, including the design process, engineering mechanics and materials, failure Prevention under static and variable loading, and characteristics of the principal types of mechanical elements.</li><li>• Offer a practical approach to the subject through a wide range of real-world applications and examples.</li><li>• Encourage students to link design and analysis.</li><li>• Encourage students to link fundamental concepts with practical component specification.</li></ul>				
<b>Student's obligation</b>	The student’s obligations are: 1-attending the lectures in the class and online, 2-doing homework, 3- doing assignments and quizzes.4- doing examinations.				
<b>Required Learning Materials</b>	Engineering mechanics, Strength of materials, Engineering drawing. Mathematics I and II.				
<b>Evaluation</b>	<b>Task</b>		<b>Weight (Marks)</b>	<b>Due Week</b>	<b>Relevant Learning Outcome</b>
	Paper Review				
	Assignments	Homework	10%	3,6	
		Class Activity	2%		
		Report	8%	6	
		Seminar	8%	9	
		Essay			
		Project			
	Quiz		8%	5,8	
	Lab.				
	Midterm Exam		24%		
	Final Exam		40%		
	Total		100%		

<b>Specific learning outcome:</b>	The student will be able to design and analyse the most important machine elements like; shaft, riveted joints, welded joints, screwed joints, keys and coupling, power screws and flat belt pulleys	
<b>Course References:</b>	1- A Textbook Of Machine Design, R.S. Khurmi, J.K. Gupta 2- Shigley's Mechanical Engineering Design,	
<b>Course topics (Theory)</b>	<b>Week</b>	<b>Learning Outcome</b>
Introduction, review of strength of materials, riveted joints: Types of Rivet Heads. Failures of a Riveted Joint, Strength of a Riveted Joint.	1,2	
Welded joints: Introduction. Advantages and Disadvantages of Welded Joints over Riveted Joints, Types of Welded Joints, Strength of Transverse Fillet Welded Joints,	3,4	
Screwed joints: Introduction. Advantages and Disadvantages of Screwed Joints. Stresses in Screwed Fastening due to Static Loading. Stresses due to External Forces. Stress due to Combined Forces.	5,6	
Keys and coupling: Introduction. 2. Types of Keys. 3. Sunk Keys. 4. Saddle Keys. 5. Tangent Keys. 6. Round Keys. 7. Splines. 8. Forces acting on a Sunk Key. 9. Strength of a Sunk Key	7,8	
Shafts: Introduction. 2. Material Used for Shafts. 3. Manufacturing of Shafts. 4. Types of Shafts. 5. Standard Sizes of Transmission Shafts. 6. Stresses in Shafts. 7. Maximum Permissible Working Stresses for Transmission Shafts. 8. Design of Shafts. 9. Shafts Subjected to Twisting Moment Only. 10. Shafts Subjected to Bending Moment Only. 11. Shafts Subjected to Combined Twisting Moment and Bending Moment.	9,10	
Flat belt pulleys: 1. Introduction. 2. Selection of a Belt Drive. 3. Types of Belt Drives. 4. Types of Belts. 5. Material used for Belts. 6. Working Stresses in Belts. 7. Density of Belt Materials. 8. Belt Speed. 9. Coefficient of Friction Between Belt and Pulley 10. Standard Belt Thicknesses and Widths. 11. Belt Joints. 12. Types of Flat Belt Drives. 13. Velocity Ratio of a Belt Drive. 14. Slip of the Belt. 15. Creep of Belt. 16. Length of an Open Belt	11,12	

Practical Topics	Week	Learning Outcome
Questions Example Design		
Extra notes:		
External Evaluator		

