Jordan University of Science and Technology

Faculty of Engineering

Aeronautical Engineering Department

AE431 Machine Elements Design - JNQF Level: 7

First Semester 2023-2024

Course Catalog
3 Credit Hours. Introduction to the machine elements design process, static failure theories, fatigue failure theories, deflection analysis using energy methods, analysis and design of machine elements including shafts, screws, and nonpermanent joints.

Text Book	
Title	Shigleys Mechanical Engineering Design
Author(s)	R.G. Budynas & J.K. Nisbett
Edition	9th Edition
Short Name	Textbook
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref #1	Mechanical Design: an integrated approach	Ansel C. Ugural	1st Edition	
Ref #2	Machine Elements in Mechanical Design	Robert L. Mott	5th Edition	
Ref #3	International Journal of Design Engineering	International Journal of Design Engineering	1st Edition	
Ref #4	Journal of Advanced Mechanical Design, Systems, and Manufacturing	Journal of Advanced Mechanical Design, Systems, and Manufacturing	1st Edition	
Ref #5	http://machinedesign.com/news/products	website	1st Edition	

Instructor

Name	**Dr. KHALED ALJANAIDEH**
Office Location	-
Office Hours	Sun : 10:00 - 11:30 Mon : 11:30 - 13:00 Tue : 10:00 - 11:30 Thu : 10:00 - 11:30
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Class Schedule & Room
Section 1: Lecture Time: Sun, Tue, Thu : 11:30 - 12:30 Room: CH2110

Prerequisites		
Line Number	**Course Name**	**Prerequisite Type**
712040	AE204 Solid Modeling	Prerequisite / Study
713320	AE332 Aircraft Structural Materials	Prerequisite / Study

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Week 1	Introduction to the machine elements design process	**Collection** From **Textbook**, **Collection** From **Ref #1**, **Collection** From **Ref #2**, **Collection** From **Ref #3**
Week 2	Review of stress analysis basics	From **Textbook**
Weeks 3, 4, 5	Static failure theories	From **Textbook**
Weeks 6, 7, 8, 9	Fatigue failure theories	From **Textbook**
Weeks 10, 11	Deflection analysis of beams	From **Textbook**
Weeks 12, 13	Design of shafts	From **Textbook**
Weeks 14, 15, 16	Analysis and design of nonpermanent joints	From **Textbook**

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	**Course Outcome Weight (Out of 100%)**	**Assessment method**
Evaluate and design of machine elements against static failures [100SO2] [100L7S2]	30%	
Evaluate and design machine elements against fatigue failures [100SO2] [100L7S2]	30%	
Perform deflection analysis using energy methods [100SO1] [100L7K1]	10%	

Evaluate and design shafts against static and fatigue failures [100SO2] [100L7S2]	10%	
Evaluate and design nonpermanent joints against static and fatigue failures [100SO2] [100L7S2]	20%	

Relationship to Program Student Outcomes (Out of 100%)						
SO1	SO2	SO3	SO4	SO5	SO6	SO7
10	90					

Relationship to NQF Outcomes (Out of 100%)	
L7K1	L7S2
10	90

Evaluation	
Assessment Tool	**Weight**
Second Exam	25%
Final Exam	40%
Homeworks and quizzes	10%
First Exam	25%

Policy	
Attendance	The student is required to attend all the registered courses. The instructor shall register student attendance or absence electronically. JUST policy requires the faculty member to assign ZERO grade (35) if a student misses 20% of the classes. If you miss a class, it is your responsibility to find out about any announcements or assignments you may have missed.
Exam/Homework	Makeup exam should not be given unless there is a valid excuse according to JUST policies. Arrangements to take an exam at a time other than the one scheduled MUST be made prior to the scheduled exam time. Cheating or copying from neighbor on exam, quiz, or homework is an illegal and unethical activity. Standard JUST policy will be applied. All assignments must be your own work (your own words) Students are responsible for all information provided in lecture. Information presented in class supersedes any information posted elsewhere.
Classroom rules	No excessive talking; no eating; no open laptops; no texting; no smart phone usage for any reason.

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