



The Hashemite University
Faculty of Engineering
Course Syllabus
Department of Mechatronics



Course Title:	Machine Design I, 2 (2,0, 0)	Course Number:	1704051312
Designation:	Compulsory	Prerequisite(s):	110402330
Instructor:	Eng. Ayat Al-Jarrah	Instructor's e-mail:	ayataljarrah@hu.edu.jo
Office Hours:	12:00 – 13:00: Sun., Tue		

Course Description (catalog): this course introduces third-year level engineering students to the concept of mechanical design. It includes various materials needed to design mechanical system elements. Initially students will be familiar with some concepts and definitions, and then they will be introduced to the considerations and procedures of mechanical elements design.

Textbook(s) and/or Other Supplementary Materials:

Mechanics of Materials; by Ferdinand, Russel, John and David, 6th Edition.

Mechanical Engineering Design; by Shigley 9th Edition.

References:

Machine design: An Integrated Approach; R. Norton; Prentice.

Machine design: An Integrated Approach; A. Ugural; Hill.

Major Topics Covered:

Topic	# Weeks	# Contact hours*
Ch 1. Introduction (and Statistical Considerations)	1	3
Ch 2. Materials	1	3
Ch 3. Load and Stress Analysis	3	9
Ch 4. Deflection and Stiffness	3	9
Ch 5. Failures Resulting from Static Loading	1	3
Ch 6. Fatigue Failure Resulting from Variable Loading	2	6
Ch 8. Screws, Fasteners, and the Design of Nonpermanent Joints	2	6
Ch 9. Welding, Bonding, and the Design of Permanent Joints	2	6
Total	15	45

*Contact hours include lectures, quizzes and exams

Specific Outcomes of Instruction (Course Learning Outcomes):

After completing the course, the student will:

CLO1. Be able to recognize the significance of material selection, statistical analysis and the reliability concept in mechanical design. (a)

CLO2. Be able to perform thorough static stress, strain, deflection, and stability analyses for different machine components. (a, e)

- CLO3.** Be able to identify and apply the various static failure theories as related to mechanical engineering design. (c, e)
- CLO4.** Be able to identify and apply basic fatigue and fracture analyses as related to mechanical engineering design. (c, e, j)
- CLO5.** Be able to apply the above techniques in the design or analysis of standard machine components, such as fasteners and weldments. (c, e)

Student Outcomes (SO) Addressed by the Course:

#	Outcome Description	Contribution
General Engineering Student Outcomes		
(a)	an ability to apply knowledge of mathematics, science, and engineering	H
(b)	an ability to design and conduct experiments, as well as to analyze and interpret data	
(c)	an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	M
(d)	an ability to function on multidisciplinary teams	
(e)	an ability to identify, formulate, and solve engineering problems	H
(f)	an understanding of professional and ethical responsibility	L
(g)	an ability to communicate effectively	
(h)	the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	
(i)	a recognition of the need for, and an ability to engage in life-long learning	
(j)	a knowledge of contemporary issues	L
(k)	an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	
H=High, M= Medium, L=Low		

Grading Plan:	1st Exam	30 Points	Sun.	24/2/2019
	2nd Exam	30 Points	Sun.	7/4/2019
	Final exam	40 Points	To be arranged by HU	

Prepared by:

Eng. Ayat Al-Jarrah

Date: 15th Jan. 2019