



**The University of Jordan**  
**School of Engineering**  
**Industrial Engineering Department**  
**Spring 2020/2021**

<b>Course name:</b>	Engineering Design		
<b>Course code:</b>	0906333		
<b>Credits hours</b>	3		
<b>Contact hours/room:</b>	10:00 – 11:00 Sun, Tue & 11:30 – 12:30 Mon		
<b>Course instructor's name, E-mail, and phone:</b>	Dr. Walid Khraisat		
	<a href="mailto:w.khraisat@ju.edu.jo">w.khraisat@ju.edu.jo</a>		
	22872		
<b>Course Coordinator:</b>	Dr. Walid Khraisat		
<b>Text book:</b>	-Shigley's Mechanical Engineering Design, R.G. Budynas, <i>J.K.Nisbett</i> , 10 <sup>th</sup> edition in SI Units, McGraw Hill, 2011		
<b>Other reference(s):</b>	1. Mechanics of Materials, R.C. Hibbeler, 4th. Ed.,2000, Prentice Hall 2. Mechanics of Materials, F.P. Beer, E.R.Johnston, and J.T. Dewolf, 3rd Edition, 2002, McGraw-Hill, Inc. 3. Mechanics of Materials, by W.F. Riley, L.D. Sturges, and D.H. Morris, 5th Edition, 1999, John Wiley and Sons, Inc 4- Mechanics of Materials, James M. Gere, 5th ed., 2001, Brooks/Cole Thomson Learning		
<b>Course Description:</b>	Types of stress and type of strain, stress strain analysis, principle stresses, Mohr's circle yield criteria, transmission mechanisms and kinematics. Joints, pulleys, and belts. Gears, gear train, cams, clutches , brakes and flywheels. Hydraulic components and circuits, bolts, shafts, keys and springs. System integration. Design project is part of the course.		
<b>Providing Department:</b>	Industrial Engineering		
<b>Prerequisite Course:</b>	0906231 + 0904131		
<b>Course type</b>	Mandatory		
<b>Assessment Methods:</b>	<b>Method</b>	<b>Weight %</b>	<b>Date</b>
	Mid-term Exam	30	
	Quizzes	5	N/A
	Creo 2 Lab assignments	15	
	Final Exam	50	TBD
<b>Course Learning Outcomes:</b>	#	<b>After successful completion of this course, the student will be able to</b>	<b>SO</b>
	<b>CLO1</b>	Students will be able to calculate the life of ball ,roller bearings and tapered bearings	<b>2</b>
	<b>CLO2</b>	Perform fatigue failure analysis both finite and infinite life distributions	<b>1</b>
	<b>CLO3</b>	Be able to use the CAD/CAM package Creo 2 as a tool to visualize and design machine elements	<b>7</b>
	<b>CLO4</b>	Students will be able to determine shaft parameters so that design conditions for performance are met	<b>1,2</b>

	<b>CLO5</b>	Be able to identify thread Standards, Power Screws, Threaded Fasteners, Fastener and member stiffness, Tension and shear connections, Setscrews, Keys and Pins	<b>2</b>
Brief list of topics	<b># of Weeks</b>	<b>Reading Material</b>	<b>Topic</b>
	1	Ch1	Introduction to Basic Mechanical Engineering Design
	1	Ch2	Materials
	1	Ch3	Load and Stress Analysis and Flywheels
	2	Ch4	Deflection and Stiffness
	2	Ch5	Failure Theories
	2	Ch6	Fatigue
	2	Ch7	shafts, keys
	2	Ch 8	Bolts, Screws, Fasteners and the design of Non permanent Joints
	2	Ch 11	Rolling-Contact Bearings
<b>This part will be covered during Creo 2 sessions</b>	2sessions	Ch10	Springs
	3sessions	Ch14	Gears+gear trains + System integration
	3sessions	Ch 16	Clutches, Brakes, Couplings,
<b>Important Notes:</b>	<ul style="list-style-type: none"> <li>• Passing grade must earn in all the components (Lectures and lab) of this class.</li> <li>• Prompt, regular attendance is necessary for the lecture, and the exams. There is no makeup for the Midterm exam, missing them will give you zero grade.</li> <li>• Any students needing assistance because of any disabilities must notify the instructor, and follow established university procedures.</li> <li>• Cheating and Honor Code</li> <li>• Any student caught cheating, or helping someone cheat, will be reported to the Dean Council Students are expected to be ready to take a quiz any time they have a class. There will be no make-up quizzes or home works.</li> <li>• Any students with disabilities who need accommodations in this course are encouraged to speak with the instructor as soon as possible to make appropriate arrangements for these accommodations.</li> </ul>		

<b><i>The B.Sc. in industrial Engineering program enables students to achieve, by the time of graduation the following program learning outcome (SOs)</i></b>			
<b>1</b>	<i>An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.</i>	<b>5</b>	<i>An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.</i>
<b>2</b>	<i>An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.</i>	<b>6</b>	<i>An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.</i>
<b>3</b>	<i>An ability to communicate effectively with a range of audiences.</i>	<b>7</b>	<i>An ability to acquire and apply new knowledge as needed, using appropriate learning strategies</i>
<b>4</b>	<i>An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.</i>		