

Number of units 6	T 3	Pr -	Th 3	Number of weekly hours	Annual System 30 weeks	Al-Esra'a University College Department: Engineering of Refrigeration and Air Conditioning Technologies
				MECHANICS		First stage
<u>Course Objective</u>						
Teaching the students, the basic principles of statics and dynamics which have crucial role in solving technical problems as well as their role in design and construction of machines, tools.						

Week	Topics	Practical subject	Notes
	Statics:		
1	Fundamentals concepts		
2-3	Vector & load analysis: Scalar-2-D & 3-D analysis , vector position, force along line, Dot product.		
4	Equilibrium of particles: 2-D & 3-d force system.		
5-6	Force moments : scalar definition, Cross product, vector definition, moment about axis.		
7	Couple: couple determination, resultant force & moments		
8-9	Equilibrium of Rigid Bodies: 2-D & 3-D equilibrium		
10-11	Dry friction		
12-13	Center of area: center of (line, area under the curve, compound area)		
14	Center of Gravity		
15	Moment of Inertia of compound area		
Half-year Break			
	Dynamics:		
16-17	Particles Motion: continuous linear motion, linear motion by curves		
18-19	General curve linear motion :rectangular motion, projectiles, normal& tangent component		
20-21	Absolute dependent motion: two particles analysis, Relative Motion analysis of two particles using Translating axes.		
22-23	Work & energy: work, principle of work & energy, principle of work & energy for system of particles.		
24	Power & efficiency .		
25-26	Conservative forces & potential energy, conservation of energy.		
27-28	Impulse and Momentum :principle of linear impulse & momentum, principle of linear impulse & momentum for a system of particles.		
29	Impact		
30	Vibration: Undamped free vibration		