

الساعات الأسبوعية			السنة الدراسي 1st.stage الأولى	اسم المادة (Mechanics Theoretical Parts)
المجموع	عملي	نظري		
5	3	2		

The aim: -Study the effects of the forces on bodies as static and dynamic (Kinetics Kinematics) bodies, and also study the stresses and strain occurs due to the Loads.

Theoretical Subjects	
Week No.	Subject Topics
1	1-Static, fundamental concepts, Force, Scalars and, Vectors, Units, Force polygon, Cartesian Components.
2	Analysis of Forces
3	Resultant of Concurrent, Coplanar Force system (2-D)
4	Moments
5	Couples, transformation of the Couple and the force
6	Resultant of non –Concurrent, Coplanar force system (3-D).
7	Equilibrium, free body diagram (F.B.D.)
8	Equilibrium Conditions (2-D)
9	Equilibrium Conditions (3-D)
10	Friction, Dry Friction
11	Center of Gravity, Centroid (length, area), Centroid of Simple area
12	Centroids of Composite areas.
13	Moment of inertia (Simple and Composite areas).

14	2-Dynamics type of motion, Linear motion with constant speed.
15	Linear motion with Constant acceleration.
16	Newton's Second Law
17	Curvilinear motion
18	Angular motion, Relative Motion.
19	Work, Energy, Power
20	3-Strength of material: Fundamental concept, Loads, Stress, Strain, Elasticity, Plasticity, Deformation.
21	Hook's Law, Stress -strain curve, type of stress.
22	Normal stress due to an axial load on 1-Uniform Cross section area 2-Variable cross section area.
23	Shear Stress
24	Torsional Stress
25	Thermal Stress
26	Beams, types of loads, types of beams.
27	Shear force (S.F.) & bending moment (B.M.) of Simple supported beam under an –axial load.
28	Shear force (S.F.) & bending moment (B.M.) of Simple supported beam under uniform distributed Load.
29	Shear force (S.F.) & bending moment (B.M.) of cantilever beam under an – axial load.
30	Shear force (S.F.) & bending moment (B.M.) of cantilever beam under uniform distributed Load.

الجانب العملي

Week No.	Practical Subject
1	Define the laboratory & the method of writing reports.
2	Problem Solving, conversion of units, product of a Scalar and vector.
3	Force resolution, Finding the resultant of (2-D) by graphical method.
4	Computing the resultant of (2-D) by Analytical method.
5	Discussion.
6	Moment's, Couples, Applications.
7	Computing the resultant of (3-D) problems.
8	Equilibrium test, types of supports condition of equilibrium.
9	Tests and Discussion.
10	Friction tests.
11&12	Finding the centroid of different shapes 1- simple 2- Composite
13	Finding the moment of inertia of different Shapes 1- Simple 2- Composite
14	Application of straight motion.
15	Application of Newton's second law.
16	Measurement of velocity & acceleration for different cases.
17	Examples of curvilinear, angular, relative motion.
18	Work, test, Evaluating the work and power.
19	Discussion

20	Torsion test
21	Compression test
22	Torsion test
23	Shear test
24	Impact test
25	Discussion
26	Hardness test by Rockwell & Brinell Methods.
27	Vickers Hardness test.
28	Bending tests.
29	Beams tests.
30	Final Practical Exam.