Sana'a University
Faculty of Engineering
Department: Basic Engineering Sciences
Title of the Program: B.Sc. of Mechanical Engineering

7. Template for Course Plan (Syllabus) of Engineering Mechanics – Statics

I. Information about Faculty Member Responsible for the Course:								
Name of Faculty Member	Prof.Dr. Mohammed Ahmed Al-Bukhaiti	**Office Hours**						
Location& Telephone No.	University of Sana'a, Faculty of Engineering, +00967 777161416	**SAT**	**SUN**	**MON**	**TUE**	**WED**	**THU**
E-mail	m.albukhati@eng-su.edu.ye m.albukhaiti@gmail.com						

Course Identification and General Information:						
1-	Course Title:	Engineering Mechanics – Statics				
2-	Course Number & Code:	BR001				
3-	Credit hours:	C.H				Total
		Th.	Seminar/Tu.	Pr	Tr.	
		2	2	-	----	3
4-	Study level/year at which this course is offered:	First Year – First Semester				
5-	Pre –requisite (if any):	----------				
6-	Co –requisite (if any):	Mathematics				
7-	Program (s) in which the course is offered	Mechanical Engineering				
8-	Language of teaching the course:	English				
9-	System of Study:	Semesters				
10-	Mode of delivery:	Lectures and Tutorials				
11-	Location of teaching the course:	Mechanical Engineering Department				

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III. Course Description:

This course provides a basic understanding of the part of mechanics which is concerned with the equilibrium of bodies under the action of forces. It lays the foundation and framework for subsequent courses, namely Dynamics, Strength of Materials, Theory of Machines, Design of Machine Elements. Topics covered includes basic concepts of mechanics and vectors; forces and force systems and their external effects on bodies, principally the condition of equilibrium of two-and three-dimensional systems; free-body diagrams and equilibrium of particles and bodies; moments; couples; structural analysis and trusses; distributed forces; center of mass; centroids; friction and application of frictional forces. The formulation and solution of mechanics problems will help the students develops the ability of logical thinking and effective communication. In each chapter, the complete theory and the method of analysis will be introduced in the beginning followed by solved examples and assignments.

IV. Intended learning outcomes (ILOs) of the course:

- Brief summary of the knowledge or skill the course is intended to develop**:**

1. Define the fundamental concepts used in engineering mechanics such as vectors, forces, moments, static equilibrium, structures, center of mass, center of gravity, and centroids.
2. Identify the appropriate tools and analytical methods in solving engineering mechanics problems.
3. Explain, describe and apply principles and components of Engineering Mechanics including vectors, forces, moments, mass and inertia in two and three dimensions, and equilibrium conditions.
4. Perform free-body diagrams of bodies, calculate forces, and do equilibrium analysis for a mechanical system in static rest.
5. Develop logical and creative thinking by defining their own methodologies for problem solution.

V. Course Content:

- Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

Order	Units/Topics List	Sub Topics List	Number of Weeks	Contact hours

1.	Introduction to Statics	- Mechanics - Basic Concepts - Scalar & vector quantities - Newton's law, system of units, laws of gravitations	1st	2
2.	Two-Dimensional Force Systems	- Force, Force classifications, Concurrent forces - Vector components - Rectangular components - Moment - Couple - Resultants	2nd ,3rd ,4th	6
3.	Three-Dimensional Force Systems	- Rectangular components - Dot product - Angle between two vectors - Moment and couple - Resultants	5th , 6th , 7th	6
4.	Mid-term exam	- The first six lectures	8th	2
5.	Equilibrium in Two Dimensions	- Mechanical system isolation and free-body diagram - Equilibrium conditions	9th , 10th	4
6.	Equilibrium in Three Dimensions	- Free-body diagrams - Equilibrium conditions - Constraints and statical determinacy	11th	2
7.	Structures	- Plane trusses, simple trusses - Internal and external redundancy - Method of joints - Special Conditions	12th	2
8.	Distributed Forces	- Centre of mass, center of gravity, and centroids	13th ,14th	4

		- Centroids of lines, areas & volumes - Composite bodies and figures		
9.	Friction	- Frictional phenomenon - Types of friction - Dry friction	15th	2
10.	Final Exam		16th	2
Number of Weeks /and Units Per Semester			**16**	**32**

B – Practical Aspect:

Order	Topics List	Week Due	Contact Hours
1.	Introduction to Statics	1	2
2.	Two-Dimensional Force Systems	2,3,4	6
3.	Three-Dimensional Force Systems	5,6,7	6
4.	Equilibrium in Two Dimensions	8,9	4
5.	Equilibrium in Three Dimensions	10	2
6.	Structures	11	2
7.	Distributed Forces	12,13	4
8.	Friction	14	2
Number of Weeks /and Units Per Semester		**14**	**28**

VI. Teaching strategies of the course:

- Active Lectures.
- Tutorials.
- Interactive class discussions.
- Self-learning from textbooks.
- Exercises and Homework.
- Small group working.
- Problem based learning.
- Presentations

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1.	Introduction to Statics. Vectors	a1, a2	1	0.5
2.	Two-Dimensional Force Systems: Force, Concurrent forces, Vector components Rectangular components.	a1, a2, b1, c1,d1	2	0.5
3.	Two-Dimensional Force Systems: Moment and couple.	a1, a2, b1, c1,d1	3	0.5
4.	Two-Dimensional Force Systems: Resultants.	a1, a2, b1, c1,d1	4	0.5
5.	Three-Dimensional Force Systems: Rectangular components, Dot product.	a1, a2, b1, c1,d1	5	0.5
6.	Three-Dimensional Force Systems: Moment and couple.	a1, a2, b1, c1,d1	6	0.5
7.	Three-Dimensional Force Systems: Resultants.	a1, a2, b1, c1,d1	7	0.5
8.	Equilibrium in Two Dimensions: Mechanical system isolation and free-body diagram.	a1, a2, b1, c1,d1	8	0.5
9.	Equilibrium in Two Dimensions: Equilibrium conditions.	a1, a2, b1, c1,d1	9	0.5

10.	Equilibrium in Three Dimensions	a1, a2, b1, c1,d1	10	0.5
11.	Structures	a1, a2, b1, c1,d1	11	0.5
12.	Distributed Forces: Centre of mass, center of gravity, and centroids, Centroids of lines, areas & volumes.	a1, a2, b1, c1,d1	12	0.5
13.	Distributed Forces: Composite bodies and figures.	a1, a2, b1, c1,d1	13	0.5
14.	Friction.	a1, a2, b1, c1,d1	14	0.5
	Total			5

VIII. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Written assignments.	1-14	7.5	5
2	Homework and project.	1-14	7.5	5
3	Written test: Mid-term exam	8	15	10
5	Written test: Final Exam	16	105	70
	Total		**150**	**100%**

IX. Learning Resources:

- *Written in the following order: (Author – Year of publication – Title – Edition – Place of publication – Publisher).*

1- Required Textbook(s) (maximum two).

1. J. L. Meriam, L. G. Kraige, 2014, Engineering Mechanics, Statics, 8th Edition, John Wiley Publisher.

2- Essential References.

1. R. C. Hibbeler, Kai Beng Yap, 2013, Engineering Mechanics, Statics, 13th Edition, Pearson Education South Asia Ltd.

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3- Electronic Materials and Web Sites *etc*.
SOLID WORK

X. Course Policies:

1.	**Class Attendance:** -A student should attend not less than 75 % of total hours of the subject; otherwise he will not be able to take the exam and will be considered as exam failure. If the student is absent due to illness, he/she should bring an approved statement from university Clinic
2.	**Tardy:** - For late in attending the class, the student will be initially notified. If he repeated lateness in attending class he will be considered as absent.
3.	**Exam Attendance/Punctuality:** - A student should attend the exam on time. He is Permitted to attend an exam half one hour from exam beginning, after that he/she will not be permitted to take the exam and he/she will be considered as absent in exam.
4.	**Assignments & Projects:** - The assignment is given to the students after each chapter; the student has to submit all the assignments for checking on time.
5.	**Cheating**: - For cheating in exam, a student will be considered as failure. In case the cheating is repeated three times during his/her study the student will be disengaged from the Faculty.
6.	**Plagiarism**: Plagiarism is the attending of a student the exam of a course instead of another student. If the examination committee proved a plagiarism of a student, he will be disengaged from the Faculty. The final disengagement of the student from the Faculty should be confirmed from the Student Council Affair of the university.
7.	**Other policies:** - Mobile phones are not allowed to use during a class lecture. It must be closed, otherwise the student will be asked to leave the lecture room - Mobile phones are not allowed in class during the examination. Lecture notes and assignments my given directly to students using soft or hard copy

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