اعتماد
NCAAA

T4

2020

Course Specifications

Course Title:	**Mechanics**
Course Code:	**2022203-4**
Program:	**Bachelor in Mathematics.**
Department:	**Department of Mathematics and Statistics**
College:	**Faculty of science**
Institution:	**Taif university**

Table of Contents

A. Course Identification

1. Credit hours: (4) Hours	

2. Course type

a. University ☐ College ☐ Department ☑ Others ☐

b. Required ☑ Elective ☐

3. Level/year at which this course is offered: 6th level, 2nd year

4. Pre-requisites for this course (if any)**:** Calculus II (2022104-4)

5. Co-requisites for this course (if any)**:**

None

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	**5Hr /Week**	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	**50**
2	**Laboratory/Studio**	
3	**Tutorial**	
4	**Others** (specify)	
	Total	**50**

B. Course Objectives and Learning Outcomes

1. Course Description

This course introduces vectors algebra. Force- Forces Resolved in Plane-Resultant of several coplanar forces – Equilibrium of a particle (body) acted upon two forces – Application.Equilibrium of a particle (body) acted upon three (several) forces-. Study center of gravity. Provide an understanding of friction, forces distribution, and momentum in the plane. Dynamics of the physical point "movement in a straight line", Newton's laws are also included. Study and derive the motion of projectiles in the plane, polar coordinates, Components of the velocity and the acceleration in polar coordinates-Applications circular motion, and the movement in resistive medium. From which emerge an understanding of the simple harmonic motion.

2. Course Main Objective

The student will be taught as follows:

1. Introducing the fundamental concepts in mechanics.
2. Examining mechanical system and deriving all forces, couples, moments and its applications.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding:**	
1.1	Recognize the motion for various systems.	K2
1.2	Describe Newton's laws and equations of equilibrium.	K2
2	**Skills:**	
2.1	Explain the simple projectiles motion and their applications.	S4
2.2	Evaluate a mechanical system.	S4
2.3	Demonstrate all forces, couples and momentums of the mechanical system.	S4
3	**Values:**	
3.3	Show the responsibility for their own learning and continuing personal and professional development.	V2

C. Course Content

No	List of Topics	Contact Hours
1	Vector Algebra (Addition, subtraction and multiplication) (Scalar and vector product double and triple)	5
2	Force- Forces Resolved in a Plane-Resultant of several coplanar forces – Equilibrium of a particle (body) acted upon two forces – Applications,	5
3	Equilibrium of a particle (body) acted upon three (several) forces- Applications,	5
4	Momentum: Moment of a force- principle of moments - Applications,	5
5	Friction – Forces distribution	5
6	**Midterm exam,** Centre of gravity, Dynamics of the physical point "movement in a straight line"	5
7	Newton's Laws, Projectiles in the plan,	5
8	Polar coordinates – Components of the velocity and the acceleration in polar coordinates-Applications	5
9	Circular motion, Movement in resistive medium	5
10	Simple harmonic motion	5
Total		**50**

D. Teaching and Assessment
1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding:**		
1.1	Recognize the motion for various systems.	• Lectures • Group discussions	• Quizzes
1.2	Describe Newton's laws and equations of equilibrium.	• Lectures • Self-learning through the website	• Exams

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
2.0	**Skills:**		
2.1	Explain the simple harmonic, projectiles motion and their applications.	• Lectures • Interactive classes	• Exams
2.2	Evaluate a mechanical system.	• Self-learning through the website • Problem based learning •	Quizzes
2.3	Demonstrate all forces, couples and momentums of the mechanical system.	• Group discussions • Self-learning through the website • Problem based learning	• Exams
3.0	**Values**		
3.1	Show the responsibility for their own learning and continuing personal and professional development.	• projects	Oral exams

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	**Quizzes + Home works**	**Continues**	**10 %**
2	**Midterm exam**	**5th-6th**	**30 %**
3	**Class Work (Homework- report- class test....)**	**8th**	**10 %**
4	**Final exam**	**11th**	**50 %**

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:

6 hours per week (as defined in the teaching schedule of the faculty member) for academic advice and consultations.
Teaching staff is also available using Blackboard web site and Taif University "Edugate" System.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	Gupta, Kumar and Sharma,Classical Mechanics, India (2003). https://www.amazon.in/Classical-Mechanics-Gupta/dp/9350067137
Essential References Materials	Hannah, J. & Hillier, M., Applied Mechanics (3e), Pearson United Kingdom, 1995
Electronic Materials	http://farside.ph.utexas.edu/teaching/301/lectures/node3.html

Other Learning Materials	https://en.wikipedia.org/wiki/mechanics

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	**Classrooms, which can accommodate up to 50 students and equipped with e-podiums, and internet access.**
Technology Resources (AV, data show, Smart Board, software, etc.)	**Laptop, smart board, and projector.**
Other Resources (Specify, e.g., if specific laboratory equipment is required, list requirements or attach a list)	**Wi-Fi internet connections**

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment	Students	Indirect
Quality of learning resources	Peer Reviewer Students	Direct Indirect
Extent of achieving the course learning outcomes	Peer Reviewer Students	Direct Indirect

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	Department of Mathematics and Statistics
Reference No.	11
Date	12-7-1443 H

قسم الرياضيات والإحصاء
Mathematics and Statistics
Department

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جامعة الطائف
TAIF UNIVERSITY