



# Course Specifications

<b>Course Title:</b>	Dynamics
<b>Course Code:</b>	352 Math-3
<b>Program:</b>	B.Sc. Mathematics
<b>Department:</b>	Mathematics
<b>College:</b>	Arts and Sciences
<b>Institution:</b>	Najran University

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## A. Course Identification

1. Credit hours:			
2. Course type			
a.	University <input type="checkbox"/>	College <input type="checkbox"/>	Department <input checked="" type="checkbox"/>
b.	Required <input checked="" type="checkbox"/>	Elective <input type="checkbox"/>	Others <input type="checkbox"/>
3. Level/year at which this course is offered: 6 / 8			
4. Pre-requisites for this course (if any): 151 Math-3			
5. Co-requisites for this course (if any): Non			

## 6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	3	100%
2	Blended	---	---
3	E-learning	---	---
4	Correspondence	---	---
5	Other	---	---

## 7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
<b>Contact Hours</b>		
1	Lecture	45
2	Laboratory/Studio	---
3	Tutorial	---
4	Others (Exams)	3
	<b>Total</b>	48
<b>Other Learning Hours*</b>		
1	Study	35
2	Assignments	10
3	Library	10
4	Projects/Research Essays/Theses	---
5	Office hours	15
	<b>Total</b>	118

\* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

## B. Course Objectives and Learning Outcomes

## 1. Course Description

This course will cover the foundations of the particle motion in one, two and three dimension in cartesian and polar coordinate, Simple harmonic motion, Projectiles motion, Pulleys and the Orbital motion.



**2. Course Main Objective**

The main objective of this course is the study of parameters of motion of particle.

**3. Course Learning Outcomes**

CLOs		Aligned PLOs
1	<b>Knowledge:</b>	
1.1	Define the basis parameters of motion of particle (the distance, velocity and acceleration, .....).	L1
1.2	State famous elementary results of dynamics.	L2
2	<b>Skills :</b>	
2.1	Ability to convert the problems of body movement to mathematical equations and solve them to determine the parameters of motion.	L4
2.2	Ability to solve mathematical equations of body movement to determine the parameters of movement.	L5
3	<b>Competence:</b>	
3.1	Work as part of a team and independently	L6
3.2	Present the main concepts of the dynamic to others, both in oral and written form confidently.	L7

**C. Course Content**

No	List of Topics	Contact Hours
1	Particle motion in one dimension.	3
2	The movement of the particle in plane and space.	6
3	Moment of inertia.	3
4	Newton's laws of motion, work and energy.	6
5	Simple harmonic motion.	6
6	Projectiles motion.	6
7	The orbital motion.	6
8	Push and collision.	6
9	Pulleys.	3
<b>Total</b>		<b>45</b>

**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	<b>Knowledge</b>		
1.1	Define the basis terminology of dynamics	At the beginning of each lecture, some examples	Quiz Homework



Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.2	State famous elementary results of dynamics.	will be presented and discussed with students to encourage them to discover related concepts and provide definitions.	Quiz Homework
2.0	<b>Skills</b>		
2.1	Derive different equations of particle motion.	Discussion and exercises during lecture time	Written Exam Homework
2.2	Give different examples of motion types.	Discussion and exercises during lecture time	Quiz Homework
2.3	Solve various problems in dynamics.	Discussion and exercises during lecture time	Quiz Written Exam
2.4	Prove elementary theorems in dynamics.	Discussion and exercises during lecture time	Written Exam Homework
3.0	<b>Competence</b>		
3.1	Work as part of a team and independently	Group problems solving during tutorial	Oral Exam Rubrics
3.2	Present the main concepts of dynamics to others, both in oral and written form confidently	Homework and discussions in the classes	Oral Exam Rubrics

## 2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Exercises, Homework & Assignments	Open	10%
2	Written Test(1)	7 <sup>th</sup> Week	20%
3	Written Test(2)	13 <sup>th</sup> Week	20%
4	Final Exam	End of Semester	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 :**

- Introducing the course syllabus, grading scale and the distribution of marks for the course in the first lecture of the course.
- The office hours for this course are 3 hours/ week.

## F. Learning Resources and Facilities

### 1. Learning Resources

Required Textbooks	<ul style="list-style-type: none"> <li>Jan 1984 by Ian McDonagh, Mechanical Science for Technicians: Volume 1 Paperback – 1</li> <li>الميكانيكا العامة، الجزء الثاني ديناميكا الجزيء د. فؤاد زين العرب، دار الرايب الجامعية - لبنان (١٩٩١)</li> </ul>
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<b>Essential References Materials</b>	<ul style="list-style-type: none"> <li>Ferdinand P. Beer &amp; E. Russell Johnston Jr. Vector Mechanics for Engineers ( Dynamics ) McGraw-Hill Book Company Inc. 1977</li> </ul>
<b>Electronic Materials</b>	<ul style="list-style-type: none"> <li>Lectures on the Department of Mathematics YouTube Channel.</li> <li>Other electronic materials available on the internet</li> </ul>
<b>Other Learning Materials</b>	- Non

## 2. Facilities Required

Item	Resources
<b>Accommodation</b> (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom with suitable seats
<b>Technology Resources</b> (AV, data show, Smart Board, software, etc.)	<ul style="list-style-type: none"> <li>Data show</li> <li>Smart Board</li> <li>Wi Fi</li> </ul>
<b>Other Resources</b> (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	<ul style="list-style-type: none"> <li>None</li> </ul>

## G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Student course evaluation survey at the end of semester.	Students	Questionnaire (Indirect)
Effectiveness of teaching and assessment	Peer Reviewer	Rubrics (Indirect)
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**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

<b>Council / Committee</b>	
<b>Reference No.</b>	
<b>Date</b>	