2023
TP-153

Course Specification
(Bachelor)

Course Title:	Dynamics
Course Code:	205-GEC-3
Program:	Bachelor of Science in Engineering
Department:	College of Engineering
College:	College of Engineering
Institution:	Najran University
Version:	1.0
Last Revision Date:	02/27/2024

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours:3					
2. Course type					
A.	☐University	☒ College	☐Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: Second Year \ Level 4					
4. Course general Description:					
Basic considerations (Vector operations, Newtonian mechanics), Engineering applications of virtual work, Kinematics of particles, Newton's law, Kinematics of plane rigid bodies, Equations of motion, Work and energy, the principle of impulse and momentum, and vibrations.					
5. Pre-requirements for this course (if any)**:**					
101-GEC-3 (Statics)					
6. Co-requisites for this course (if any)**:**					
NIL					
7. Course Main Objective(s):					
1. To Recognize Position, velocity, and acceleration of particles and rigid bodies in relation to space and time. 2. To understand Kinematics of a particle, including rectilinear and curvilinear. 3. Be familiar with Projectile motion principle and its application. 4. To understand the principles of Newton's Second Law and its applications. 5. To analyze the kinetic of a particle using work and energy method. 6. To apply the principle of linear Impulse and Momentum for a particle. 7. To understand Planar Kinematics of a rigid body.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100%
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		

No	Mode of Instruction	Contact Hours	Percentage
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	15
2.	**Laboratory/Studio**	NIL
3.	**Field**	NIL
4.	**Tutorial**	45
5.	**Others (specify)**	NIL
Total		60

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	**Know the law of motion in one, two and three-dimensional kinematics, law of principle of work and energy, Newton's laws, the types of impact and apply conservation of linear momentum.**	**1**	**Knowledge and understanding TS:1-Interactive lectures using PowerPoint slides with more examples in the class. TS:2- Engaging the students in problem-based learning through examples. TS:3-Recall the topics discussed in the last lecture by asking questions to the students.**	**Test performance evaluation -Evaluation through individual assignments**

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			TS: 4 – Associating the topics in each chapter with the CLO. TS:5 –Discussion with the students in the class hours	
1.2	Test performance evaluation -Evaluation through individual assignments	7	TS:1-Interactive lectures using PowerPoint slides with more examples in the class. TS:2- Engaging the students in problem-based learning through examples. TS:3-Recall the topics discussed in the last lecture by asking questions to the students. TS: 4 – Associating the topics in each chapter with the CLO. TS:5 – Discussion with the students in the class hours	Test performance evaluation -Evaluation through individual assignments
...				
2.0	**Skills**			
2.1	Thinking through problems solving, reasoning for each problem solved, Remembering equations and principles.	2	TS:1-Interactive lectures using PowerPoint slides with more examples in the class.	•Locally Developed Exams such as Mid & Final Exams with scoring rubrics

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			TS:2- Engaging the students in problem-based learning through examples. TS:3-Recall the topics discussed in the last lecture by asking questions to the students. TS: 4 – Associating the topics in each chapter with the CLO. TS:5 –Discussion with the students in the class hours	•Assignments involving critical and logical thinking questions
2.2	Use the computer for analyzing and processing the examples.	6	TS:1-Interactive lectures using PowerPoint slides with more examples in the class. TS:2- Engaging the students in problem-based learning through examples. TS:3-Recall the topics discussed in the last lecture by asking questions to the students. TS: 4 – Associating the topics in each chapter with the CLO. TS:5 –Discussion with the students in the class hours	• Locally Developed Exams such as Mid & Final Exams with scoring rubrics •Assignments involving critical and logical thinking questions

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
...				
3.0	Values, autonomy, and responsibility			

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction and statics review	
2.	Kinematics of Particles: rectilinear, curvilinear and projectile motion	6
3.	Kinetics of a particle: Force and acceleration	10
4.	Kinetics of Particles: Principle of Work and Energy	10
5.	Kinetics of Particles Impulse and Momentum	8
6.	Impact	8
7.	Planar Kinematics of a rigid body	10
8.		8
Total		60

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Assignments	1-12	10%
2.	Quizzes	3 & 9	10%
3.	Mid-term	6 & 12	30%
4.	Final exam	15	50%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Engineering Mechanics: Dynamics - 13th Edition - R. C. Hibbeler - Pearson Prentice Hall – 2012- ISBN 13: 978-0132911276
Supportive References	Vector Mechanics for Engineers: Dynamics -10th Edition - F. P. Beer et al. - Mc-Graw Hill - 2013
Electronic Materials	N http://lib.nu.edu.sa/SDL.aspx A
Other Learning Materials	MS Excel, Word and Power point, MatLab,

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**Classrooms**
Technology equipment (projector, smart board, software)	**Smart Projector**
Other equipment (depending on the nature of the specialty)	

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Program Leaders and Peer Reviewer	Direct, Indirect
Effectiveness of Students assessment	Students & Faculty	Direct and Indirect
Quality of learning resources	Students & Faculty	Direct and Indirect
The extent to which CLOs have been achieved	Students & Faculty	Direct and Indirect
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**DEPARTMENT OF MECHANICAL ENGINEERING**
REFERENCE NO.	
DATE	**02/27/2024**