

Ministry of Higher Education and Scientific research



Department of General Science

College of Basic Education

Salahaddin University-Erbil

Subject: Classical Mechanics

Course Book – *First Year-First Semester*

Lecturer: Dr. Wala Dizayee

Academic Year: 2023/2024

Course Book

1. Course name	Mechanics
2. Lecturer in charge	Wala Dizayee
3. Department/ College	General Science/Basic Education
4. Contact	e-mail: wala.dizayee@su.edu.krd Tel: 0750 4666128
5. Time (in hours) per week	Theory: 2 hours /week Practical: 3 hours/week
6. Office hours	Monday
7. Course code	
8. Teacher's academic profile	https://academics.su.edu.krd/wala.dizayee
9. Keywords	
<p>Mechanical Physics is a fundamental branch of the science of Physics. Mechanical Physics gives basic science to the students and researchers from all aspects, especially on Classical Physics, Vectors and Scalar quantities, Kinematic motion and newton's laws of Physics. Mechanical Physics collects all the laws and ideas together concerned with the Mechanics and regular motions.</p> <p>Mechanical Physics is an old branch of Physics ended at the 19th century (before 1897).</p> <p>Dear Students;</p> <p>This coursebook outlines very short notes on Mechanical Physics for first year undergraduate students of the Department of general Science, College of Basic Education, Salahaddin University-Erbil, Kurdistan Region - Iraq. It is only a guideline to more comprehensive knowledge of the Classical physics. It is highly recommended that the student must read more from the textbooks mentioned in the references below, together with other sources in the internet.</p> <p>I wish you a good luck and success.</p>	
<p>11. Course objective: Classical mechanics</p> <p>To Study the concepts of Vector.</p> <p>To Study the basic & concepts of Forces.</p> <p>To Study the concepts of Motion and the Laws of Motion.</p> <p>To Study the concepts of Energy, Work & Power, ...</p> <p>To Study the Rotation of a Rigid Objects, ...</p> <p>To Study the concepts of Universal Gravitation.</p> <p>To Study the Motion in a Circle.</p> <p>To Study the concepts of Momentum and Collisions,</p> <p>To study the basics of Elasticity and its importance.</p> <p>To study the concepts of bending of beams and its applications.</p> <p>To study the Fluid, Viscosity and Surface tension.</p> <p>To study the Oscillations, Mechanical Waves & Sound.</p>	

12. Student's obligation

The students shall participate in discussion of the topics and solving practical examples related to the subjects. The exercises will be given to the students as home works. The students will also be asked to prepare reports on selected topics.

- Students should attend in all lectures.
- Participation in classroom discussions and solving practical examples related to the subjects.
- Home works and quiz.
- The students are required to do two mid-term exams and a final exam.

13. Forms of teaching

- White board.
- Data Show power point presentation.
- Homework and problem solving in the class.

14. Assessment scheme

Breakdown of overall assessment and examination

- Two mid-term exams (two examinations in a year, each 20%) and a final exam.
- Daily Activity.
- Attendance of students.
- Homework.

15. Student learning outcome:

This subject is concerned with the basic science of Modern physics. All the theories and laws of modern physics will be outlined during teaching of this subject.

- The student will be familiar with the basic ideas to understand several concepts about general physics, for example, units, vectors, motion and,....., etc.
- To gain experience about how to think scientifically and critically in seeking for new knowledge.

16. Course Reading List and References:

References:

- 1- Classical Mechanics PLUS, John R. Taylor, ISBN: 9781891389221.
- 2- Introduction to Classical Mechanics with Problems and Solutions. David Morin. Harvard University, USA.
- 3- 1000 Solved Problems in Classical Physics. An Exercise Book, Ahmad A. Kamal
- 4- Solved Problems in Classical mechanics.O.L.Delange & J.Pierrus. Oxford Press.
- 5- Lecture Notes on Classical mechanics. By Sunil Golwala 2007
- 6- See also the internet
- 7- Introduction to physic, 3rd ed ,F.L .Pedrotti, L.S Pedro(2007) .
- 8- Schaums outline series theory and problems of college physiscs.7-edition. Freckerick J.Bueche. (1989).
- 9- Fundamental University Physics", Alonso/Finn.
- 10- Physical Science", Bill W. Tillery.
- 11- The Physical Universe", Konrad B. Krauskopf and Arthur Beiser.
- 12- Magazines and review (internet): Using internet to get more information about the subjects.

17. The Topics:

Lecturer's name

Classical Mechanics

Chapter 1: Vectors

- 1.0 Definition of vectors and scalars, examples
 - 1.1 Scalars, addition, subtraction, multiplication and division. Examples
 - 1.2 Vector addition and subtraction. Examples
 - 1.3 Vector multiplication. Examples
 - 1.4 Vector division. Examples
 - 1.5 Dot product of vectors. Examples
 - 1.6 Cross product of vectors. Examples
 - 1.7 Solved problems.

Chapter 2: Newtons law of Motion

- 2.0 Introduction
 - 2.1 First law
 - 2.2 Second law
 - 2.3 Third law
 - 2.4 Gravitational law
 - 2.5 Newton's law of cooling
 - 2.6 Solved problems

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<p>Chapter 3: Motions</p> <p>3.0 Uniform motion</p> <p> 3.1 Speed. Examples</p> <p> 3.2 Velocity. Examples</p> <p> 3.3 Acceleration. Examples</p> <p> 3.4 Average speed and average velocity. Examples</p> <p> 3.5 Motions on a straight line with constant acceleration</p> <p> 3.6 Equations of motion. Examples</p> <p> 3.7 Solved problems</p> <p>Chapter 4: Projectile Motion</p> <p>4.0 Introduction</p> <p> 4.1 Horizontal & vertical components of velocity. Examples</p> <p> 4.2 Solved problems</p> <p>Chapter 5: Momentum & Angular Momentum</p> <p>5.0 Introduction</p> <p> 5.1 Linear momentum. Examples</p> <p> 5.2 Angular momentum. Examples</p> <p> 5.3 Solved problems</p>	
<p>18. Practical Topics (If there is any)</p>	
<p>No Practice and Experiments. It is a theoretical subject.</p>	
<p>19. Examinations:</p> <p>1. <i>Compositional:</i> In this type of exam the questions usually starts with Explain how, What are the reasons for...?, Why...?, How....? With their typical answers Examples should be provided</p> <p>2. <i>True or false type of exams:</i></p> <p>In this type of exam a short sentence about a specific subject will be provided, and then students will comment on the trueness or falseness of this particular sentence. Examples should be provided</p> <p>3. <i>Multiple choices:</i></p> <p>In this type of exam there will be a number of phrases next or below a statement, students will match the correct phrase. Examples should be provided.</p>	

20. Extra notes:

Here the lecturer shall write any note or comment that is not covered in this template and he/she wishes to enrich the course book with his/her valuable remarks.

21. Peer review:

All done

Dr.Wala Dizayee

01.10.2023