Physics I | Faculty of Engineering

Course Code:

PHYS 101

Course Period:

Autumn

Course Type:

Core

Credits:

4

Theoric:

3

Practice:

0

Laboratory Hour:

2

ECTS:

6

Course Language:

English

Course Objectives:

The aim of this course is to teach concepts of mechanics.

Course Content:

Measurement and Unit, Vectors, Motion in one and two dimensions, Newton’s Laws of Motion, Work, Power, Energy, Momentum and Collisions, Rotational Motion, Torque and Angular Momentum, Universal Gravitational Law.

Course Methodology:

1: Lecture, 2: Question-Answer, 3: Discussion,

Course Evaluation Methods:

A: Testing, B: Final, I:Lab

Learning Outcomes	Teaching Methods	Assessment Methods
1) Relates units and their conversion	1,2,3	A,B,I
2) Calculates the operations with vectors	1,2,3	A,B,I
3) Analysis the translational motion	1,2,3	A,B,I
4) Writes down the equations of motion for the systems with and without friction	1,2,3	A,B,I
5) Applies the work-energy rpinciple	1,2,3	A,B,I
6) Applies the momentum and center of mass information to various cases	1,2,3	A,B,I
7) Analaysis the cases about rotation and angular momentum.	1,2,3	A,B,I
8) Knows the universal gravitational law	1,2,3	A,B,I

Week	Topics	Study Materials
1	Measurement	Units
2	Motion in one dimension	Kinematic equations
3	Motion in two dimensions and vectors	Operations with vectors
4	Dynamics: Newton’s Laws of Motion	Laws of dynamics
5	Dynamics: Newton’s Laws of Motion	Newton’s Laws
6	Further Applications of Newton’s Laws of Motion	Newton’s Laws
7	Work, Power, Energy – Midterm I	Revision
8	Conservation of Energy	What is energy?
9	Linear Momentum and Collisions	Linear Momentum and vectors
10	Linear Momentum and Collisions	Linear Momentum and vectors

11	Rotational Motion	Circular motion
12	Rotational Motion – Midterm II	Rotational kinematics
13	Conservation of Angular Momentum	Angular momentum
14	Universal Gravitational Law	What is the gravitational field?

Textbook	Douglas C. GIANCOLI, Physics for Scientists & Engineers , 4th Edition, Pearson
Additional Resources	Halliday, Resnick, Walker: Fundamentals of Physics, 6th Edition- Serway, Jewett, Physics for Scientists and Engineers with Modern Physics, 8th Edition

Documents	Mechanics Lab Experiments Handouts
Assignments	
Exams	

IN-TERM STUDIES	**NUMBER**	**PERCENTAGE**
Mid-terms	2	50
Lab	12	20
Final	1	30
Total		**100**
CONTRIBUTION OF FINAL EXAMINATION TO OVERALL GRADE		30
CONTRIBUTION OF IN-TERM STUDIES TO OVERALL GRADE		70
Total		**100**

No	**Program Learning Outcomes**	**Contribution**				
		1	**2**	**3**	**4**	**5**
1	gains the ability to apply the knowledge in physics and mathematics					**X**
2	gains the ability to construct an experimental setup, perform the experiment, analyze and interpret the results					**X**

3	is supposed to have the education required for the measurements in scientific and technological areas			**X**		
4	is able to work in an interdisciplinary team				**X**	
5	is able to identify, formulate and solve physics problems					**X**
6	is conscious for the professional and ethical responsibility	**X**				
7	is able to communicate actively and effectively			**X**		
8	is supposed to have the required education for the industrial applications and the social contributions of physics	**X**				
9	is conscious about the necessity of lifelong education and can implement it			**X**		
10	is supposed to be aware of the current investigations and developments in the field			**X**		
11	makes use of the techniques and the modern equipment required for physical applications			**X**		

Activities	Quantity	Duration (Hour)	Total Workload (Hour)
Course Duration (Including the exam week: 14x Total course hours)	14	3	42
Hours for off-the-classroom study (Pre-study, practice)	14	5	70
Mid-terms	2	2	4
Lab	12	2	24
Final examination	1	3	3
Total Work Load			143
Total Work Load / 25 (h)			5.7
ECTS Credit of the Course			6