Course Specifications

Valid as from the academic year 2015-2016

Physics 1: Mechanics (O000079)

Course size *(nominal values; actual values may depend on programme)*

Credits 5.0	**Study time 150 h**	**Contact hrs**	60.0 h

Course offerings and teaching methods in academic year 2016-2017

A (semester 1)	guided self-study	10.0 h
	lecture: plenary exercises	10.0 h
	lecture	20.0 h
	seminar: coached exercises	20.0 h

Lecturers in academic year 2016-2017

Varzakas, Theo	KR01	lecturer-in-charge

Offered in the following programmes in 2016-2017	crdts	offering
Bachelor of Science in Food Technology	5	A
Joint Section Bachelor of Science in Environmental Technology, Food Technology and Molecular Biotechnology	5	A
Bachelor of Science in Environmental Technology	5	A
Bachelor of Science in Molecular Biotechnology	5	A

Teaching languages

English

Keywords

Basic physics, Mechanics, Newton’s laws

Position of the course

Give the students a thorough training in basic physics, with a focus on both basic principles and practical applications. The purpose of the course is to
i) make the students familiar with the numerous practical applications of mechanics in everyday life,
ii) teach them about scientific experiments and measurement methods,
iii) teach them how to report their findings, and
iv) lay the foundations that will allow students to succesfully participate in Physics 2.

Contents

1. Introduction, measurement and estimation
2. Describing motion: Kinematics in one dimension
3. Kinematics in two and three dimensions; vectors
4. Dynamics: Newton's laws of motion
5. Newton’s laws: friction, circular motion
6. Gravity and Newton’s synthesis
7. Work and energy
8. Conservation of energy
9. Linear momentum
10. Rotational motion
11. Angular momentum; General rotation

Week 1: Introduction to the course
Week 2: Chapter 1 Introduction, measurement and estimation
Week 3: Chapter 2 Describing motion: Kinematics in one dimension
Week 4: Chapter 3 Kinematics in two and three dimensions; vectors
Week 5: Chapter 4 Dynamics: Newton's laws of motion
Week 6: Chapter 5 Newton’s laws: friction, circular motion
Week 7: Chapter 6 Gravity and Newton’s synthesis

Week 8: Chapter 7 Work and energy
Week 9: Chapter 8 Conservation of energy
Week 10: Chapter 9 Linear momentum
Week 11: Chapter 10 Rotational motion
Week 12: Chapter 11 Angular momentum; General rotation

Initial competences

Secondary school knowledge of physics and mathematics.

Final competences

The student must have acquired the ability (i) to recognise and analyse forces in simple mechanical systems, (ii) to apply Newton's laws for linear and rotational motions, (iii) to define the basic concepts of Newtonian mechanics. The student must be able to recognise physical misconceptions in the popular media and to understand the set up and conduct a simple physical experiment. The student should have acquired insight in orders of magnitude of physical quantities and measurement errors.

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Guided self-study, lecture, lecture: plenary exercises, seminar: coached exercises

Learning materials and price

D. C. Giancoli (2009), Physics for scientists & engineers with modern physics, Chapters 1-11, Pearson-Prentice Hall.

References

D. C. Giancoli (2009), Physics for scientists & engineers with modern physics, Chapters 1-11, Pearson-Prentice Hall.

Course content-related study coaching

Evaluation methods

end-of-term evaluation and continuous assessment

Examination methods in case of periodic evaluation during the first examination period

Written examination with open questions, written examination with multiple choice questions

Examination methods in case of periodic evaluation during the second examination period

Examination methods in case of permanent evaluation

Participation

Possibilities of retake in case of permanent evaluation

examination during the second examination period is possible in modified form

Calculation of the examination mark

Final written exam with open questions and with multiple choice questions: 80%
Seminar Participation: 20%