

# Physique 1

## Lecturers

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## Course mnemonic

PHYS-F104

## Language(s) of instruction

French

## Course period

See programme details

## Course content

1st semester:-----Vectors, derivatives, elementary integrals.Kinematics.Dynamics (Newton's laws; linear momentum; circular motion; friction).Gravitation (Newton's law; Kepler's laws).Statics (moment of a force; laws of equilibrium).Rotation (kinematics, dynamics, conservation angular momentum).Work - power- energy(kinetic and potential energy; harmonic oscillator; conservation of mechanical energy).Elasticity.Statics and dynamics of fluids.2nd semester:-----Electrostatics force, electric field, electric potentialWaves, sound waves, light waves, geometrical opticsModern physics

## Objectives (and/or specific learning outcomes)

After having followed the lectures and the exercise sessions, the students should be capable of:-understanding basic principles of several areas of physics such as mechanics, waves, optics and electricity-applying elementary mathematical techniques to the solution of concrete problems

## Pre-requisites and co-requisites

### Courses having this one as pre-requisit

BIOL-F321 | Spécificités du développement végétal | 5 crédits , BIOL-F324 | Physique bioinspirée | 5 crédits, ELEC-H201 | Electricité et électronique | 5 crédits, GEOL-F309 | Géophysique et tectonophysique | 5 crédits, MATH-F3141 | Analyse numérique pour les équations aux dérivées partielles | 5 crédits, MECA-H301 | Systèmes énergétiques : principes de bases et technologies durables | 5 crédits and PHYS-F205 | Physique 2 | 5 crédits

## Teaching method and learning activities

Lectures: 72 hours. Exercises: 18 sets of 2 hours. Private work: - mastering elementary notions from high school (« Objectif Réussite ») - 8 sets of 8 additional exercises to be solved - Visit of the Physics Experimentarium

## Contribution to the teaching profile

> B1-BIOL - Bachelor in biology - Bloc 1 (10 credits, compulsory)- B1-GEOG -Bachelor in geography - Bloc 1 (10 credits, compulsory)- B1-GEOL - Bachelor in geology - Bloc 1 (10 credits, compulsory)- B1-PHAR - Bachelor pharmacy - Bloc 1 (10 credits, compulsory)Understanding of the scientific method in a universal context (modelisation of a problem, quantitative description through equations, resolution through elementary algebraic techniques)Solving elementary physics problems using simple laws and critical analysisBeing able to provide exact results

## References, bibliography and recommended reading

Joseph Kane et Morton Sternheim. Physique (Cours, QCM, exemples et 1900 exercices corrigés) Dunod, Paris 2004 (3e édition)

## Other information

### Contact(s)

Barbara Clerbaux, bclerbau@ulb.ac.beStephane Detournay, sdetourn@ulb.ac.beGlenn Barnich, gbarnich@ulb.ac.be

## Evaluation method(s)

Other

### Evaluation method(s) (additional information)

The course PHYS F 104 covers both semesters. The exams session in January concerns only the material covered in the first semester, the others sessions cover both semesters. There is a written exam in each session. For the exam, an A4 sheet filled with useful formulae on both sides is permitted, together with a pocket calculator. Exchanging or lending out the calculator is not allowed during the exam. An additional test will be organized in the beginning of November.

## Determination of the mark (including the weighting of partial marks)

The material covered during the first semester makes up two thirds of the final mark and the material of the second semester the remaining one third. To validate the course, the final mark (after taking the weights into account) needs to be higher or equal

than 10/20. The parts that have been successfully completed do not have to be passed again. The exam contains 2 questions that are direct illustrations of the theoretical course (40% of the mark), 2 questions similar to those covered in the exercise sessions (30% of the mark), as well as 2 questions that are slightly more difficult than the basic examples covered in the exercise sessions (30% of the mark). The November test will not contribute to the mark during the academic year 2019/2020. In 2020/2021, a successful test may contribute through bonus points. Details will appear on the website of the course (UV).

### Main language(s) of evaluation

French

## Programmes

### Programmes proposing this course at the faculty of Sciences

BA-BIOL | Bachelor in Biology | option Bruxelles/unit 1, BA-GEOG | Bachelor in Geography : General | unit 1 and BA-GEOL | Bachelor in Geology | unit 1

### Programmes proposing this course at the faculty of Pharmacy

BA-PHAR | Bachelor in Pharmacy | unit 1