

# Mécanique

**Lecturer**

Mélanie BERTELSON (Coordinator)

**Course mnemonic**

MATH-F215

**ECTS credits**

5 credits

**Language(s) of instruction**

French

**Course period**

Second term

**Campus**

Plaine

## Course content

Mechanics of a particle: equations of motion, conservation theorems, central forces.

Mechanics of a system of particles: equations of motion, center of mass, conservation theorems, two body problem.

Lagrangian formulation: systems with constraints, virtual displacements method, Lagrange equations.

Small oscillations: equilibrium positions, frequencies, normal modes, resonance.

Mechanics of the rigid body: moving frames, inertia tensor, Euler angles, equations of motion.

## Objectives (and/or specific learning outcomes)

Study of mechanical systems with several particles, holonomic constraints and rigid bodies.

## Pre-requisites and co-requisites

### Pre-requisites courses

MATH-F112 | Mathématiques 1 | 10 crédits and MATH-F115 | Compléments d'analyse et algèbre linéaire | 5 crédits

### Co-requisites courses

PHYS-H101 | Connaissances fondamentales et éléments de physique | 10 crédits

### Course having this one as co-requisit

MATH-H302 | Introduction à l'analyse complexe et au calcul numérique | 5 crédits

## Teaching method and learning activities

Theory (24hrs), exercises (24hrs)

## References, bibliography and recommended reading

- <sup>1</sup> H. Goldstein, 1980. *Classical Mechanics*. Second edition. Addison-Wesley Series in Physics.
- <sup>2</sup> L. D. Landau, E. M. Lifschitz, 1960. *Mechanics*. Pergamon Press, Addison-Wesley Publishing Co.

## Course notes

Syllabus

## Other information

### Place(s) of teaching

Plaine

### Contact(s)

Mélanie Bertelson (2.07.111) - Melanie.Bertelson@ulb.be - 02 650 58 28

## Evaluation method(s)

written examination

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

Grade based on the written exam.

### Main language(s) of evaluation

French

## Programmes

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

BA-IRBI | Bachelor in Bioengineering | unit 2

### Programmes proposing this course at the Brussels School of Engineering

BA-IRBI | Bachelor in Bioengineering | unit 2

