

Mécanique analytique

Lecturers

Frank FERRARI (Coordinator) and Glenn BARNICH

Course mnemonic

MATH-F204

ECTS credits

10 credits

Language(s) of instruction

French

Course period

First and second terms

Campus

Plaine

Course content

First semester: Calculus, elements of vector analysis; kinematics, kinetics and dynamics of systems of point particles and applications (two-body problem, central force, ...); kinematics of rigid bodies, application to non-inertial frames; kinetics and dynamics of rigid bodies.

Second semester: Lagrangian and Hamiltonian formulations of mechanics; motion of charged particles in an electromagnetic field.

Objectives (and/or specific learning outcomes)

Introduction to vector analysis. Teaching of the foundations and methods of mechanics (Newtonian mechanics and analytical mechanics in the Lagrangian and Hamiltonian formalisms), the mathematical theory of the motion of material bodies and, more generally, of the temporal evolution of dynamical systems.

Pre-requisites and co-requisites

Pre-requisites courses

MATH-F101 | Calcul différentiel et intégral I | 15 crédits

Teaching method and learning activities

Q1: Lectures given online and exercices

Contribution to the teaching profile

Learn basic skills in a related domain: physics. Understand the role played by mathematics in this context.

References, bibliography and recommended reading

second semester: lecture notes available on the web site "L'Université Virtuelle"

Course notes

Université virtuelle

Other information

Place(s) of teaching

Plaine

Contact(s)

Frank Ferrari (frank.ferrari@ulb.ac.be)

Glenn Barnich (gbarnich@ulb.ac.be)

Evaluation method(s)

Other

Evaluation method(s) (additional information)

Written tests on both theory and exercices

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

For students following both semesters, the final mark is obtained by adding the marks of the first and second semesters with an equal weight. Partial notes higher than 10 are transferred between sessions.

Main language(s) of evaluation

French

Programmes

Programmes proposing this course at the faculty of Sciences

BA-MATH | Bachelor in Mathematics | unit 2 and BA-PHYS | Bachelor in Physics | unit 2