Mécaniques classique et quantique

Lecturers
Nathalie VAECK (Coordinator) and Lieven CLARISSE

Course mnemonic
CHIM-F206

ECTS credits
10 credits

Language(s) of instruction
French

Course period
First and second terms

Campuses
Solbosch and Plaine

Course content

Part 1: Classical mechanics: periodic systems, variationnel principles, equation of Euler-Lagrange, Hamilton dynamics, waves

Part 2: Quantum mechanics: Origin, formalism, systems in one dimension, theory of time independent perturbations, systems in multiple dimensions, angular moments, atoms of one electron, variational method

Objectives (and/or specific learning outcomes)

To understand the basics of analytical mechanics and quantum mechanics

Pre-requisits and co-requisits

Pre-requisites courses

MATH-F112 | Mathématiques 1 | 10 crédits, PHYS-F110 | Physique générale I et II | 15 crédits and PHYS-F110 | Physique générale I et II | 20 crédits

Courses having this one as co-requisit

CHIM-F304 | Structures et symétries moléculaires | 5 crédits and CHIM-F325 | Spectroscopies moléculaires | 5 crédits

Teaching method and learning activities

Lectures and exercises

References, bibliography and recommended reading

Classical Dynamics - S. T. Thornton and J. B. Marion - Brooks Cole; 5th ed (2003)

Quantum Mechanics - B. H. Bransden and C.J. Joachain - Pearson Education (2000)

Chimie Physique - D. McQuarrie et J. Simon - Dunond (2000)

Other information

Place(s) of teaching

Solbosch and Plaine

Contact(s)

lclariss@ulb.ac.be, nvaeck@ulb.ac.be, nam.nguyen@ulb.ac.be

Evaluation method(s)

Other

Evaluation method(s) (additional information)

Written test ("dispensatoire") in January on the classical mechanics part. Exam in June on the material of the second term (quantum mechanics) as well as the material of the first term (classical mechanics) in case the result of the test in January was < 10/20.

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

The total mark equals the weighted average of the two marks obtained in both parts. The weights are 40% for Classical Mechanics and 60% for Quantum Mechanics respectively.

Main language(s) of evaluation

French

Programmes

Programmes proposing this course at the faculty of Sciences

BA-CHIM | Bachelor in Chemistry | unit 2