INSTITUT NATIONAL DES SCIENCES APPLIQUÉES LYON

Physics

Physics 2

IDENTIFICATION

CODE : PC-S2-PH-H
ECTS : 4.0

HOURS

Lectures : 11.0 h
Seminars : 28.5 h
Laboratory : 16.5 h
Project : 0.0 h
Teacher-student contact : 56.0 h
Personal work : 105.0 h
Total : 161.0 h

ASSESSMENT METHOD

Continuous assessment all along the school semester to check acquired knowledge and skills by tests and practical exams.
A final exam will be held at the end of the school semester to evaluate the ability to analyze and solve a problem using the knowledge and skills acquired during the whole year.

TEACHING AIDS

Textbooks with lecture notes, exercises and problems for tutorials and practicals wordings.
Multiple-choice questionnaire for autonomous training and self-assessment are available (French only).

TEACHING LANGUAGE

French

CONTACT

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AIMS

To gain an understanding and to master a lasting knowledge in Mechanics thanks to reflection and to critical mind. This comprehensive knowledge is essential to take the 2nd year courses and to an engineer education.
To develop a scientific approach to solve theoretical and experimental problems, by implementing a multiple stage approach (observation, questioning, analysis of the problem, experimentation, modelling, interpretation, critical analysis...).
The main skills aimed by this teaching are:
C11 - To split up a problem or a system into its component parts in interaction; C12 - To reduce a system or a problem by assumptions (hypothesis); C13 - To model a system or a problem by convenient dimensions or objects in relation; C14 - To build a scheme of the system or the problem; C16 - To build a proof; C21 - To compute by graphical resolution an exact or approximate solution; C24 - To implement strategies to verify results coming from modelization; C32 - To acquire experimental data by identifying and evaluating acquisition limits; C51 - To select and implement well-adapted tools to represent and analyze data; C54 - To interpret data in the context of a model

CONTENT

-Mechanics: statics; dynamics (forces, moment of a force, Newton's laws, pendulum); introduction to fluid statics; kinematics (link between the position, the path, the velocity and the acceleration of the studied object); energetic aspects (work and power, kinetic and potential energy, conservation of the total energy); introduction to solid dynamics (moments, translation and rotation about a fixed axis).

BIBLIOGRAPHY

All physics books written for first undergraduate cycle.

PRE-REQUISITE

Notions learnt during secondary education: calculus, plane geometry, and trigonometric functions, calculation skills (derivatives, anti-derivatives, complex numbers, quadratic equations, systems of linear equations, trigonometry, vectors¿), statistics (average and standard deviation), data and functions plots.
This teaching will also use the mathematical tools and skills that will be learnt all along the school year.