

Analytical Mechanics

Analytical Dynamics

IDENTIFICATION

CODE : GMCIP-3-S1-EC-DYN
ECTS : 4.0

HOURS

Lectures : 21.0 h
Seminars : 35.0 h
Laboratory : 0.0 h
Project : 0.0 h
Teacher-student
contact : 56.0 h
Personal work : 64.0 h
Total : 120.0 h

ASSESSMENT METHOD

Evaluation of continuous check
Final examination
Presentation of project proposals

TEACHING AIDS

TEACHING LANGUAGE

French

CONTACT

M. AHMAD Daniel
@
MME SANDIER Celine
celine.sandier@insa-lyon.fr

AIMS

The first part of this course concerns the classification of a dynamical problem and a quasi-static problem. In the case of a dynamical problem the goal is to establish its model in order to obtain a set of analytical equations using energy methods and optimize these equations for complex cases.

For the projet, the objective is to know how to simulate complex dynamical problems with industrial software to qualify and quantify the movement and / or its dynamical

CONTENT

Energy and kinetic energy theorem
Stresses and generalized coordinates
Virtual power principle
Lagrange equations and other energy theorems Dynamic behavior simulation of mechanical systems

BIBLIOGRAPHY

Bone J.C., Morel J., Boucher M., Mécanique générale : cours et applications, Ed. Dunod Université, 1994, 507 p. Lassia R., Bard C., Dynamique : Cours et exercices corrigés, Ed. Ellipse, 2002, 344 p.

Gignoux C., Silvestre-Brac B., Problèmes corrigés de mécanique et résumés de cours - De Lagrange à Hamilton, Edp Sciences, 2004, 413 p.

PRE-REQUISITE

Kinematics, mass geometry, kinetics, dynamics, Newtonian mechanics