

Analytical Mechanics

Stability and Kinematics

IDENTIFICATION

CODE : GMCIP-4-S1-EC-
MGMEC
ECTS : 2.0

HOURS

Lectures : 15.0 h
Seminars : 17.0 h
Laboratory : 0.0 h
Project : 0.0 h
Teacher-student
contact : 32.0 h
Personal work : 28.0 h
Total : 60.0 h

ASSESSMENT METHOD

"1 written evaluation, 75 minutes
[Stability]
1 written evaluation, 120 minutes
[Kinematics]"

TEACHING AIDS

"Lecture notes.
Exercises."

TEACHING LANGUAGE

French

CONTACT

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AIMS

"Linearize the dynamical movement equations of a multibody system.
Be able to analyse and define multibody in order to obtain given kinematics or mechanical
feedback control.
Design the kinematics of particular mechanisms : trajectory, position or function generator."

CONTENT

"1. Dynamics : equilibrium, stability, linearization of the dynamical model.
2. Kinematics
2a. 3D et 2D definitions : instantaneous rotation axes and centers, axoid surfaces, primitive
curves in 2D-motion. Reminder : slip velocity, rolling and swiveling.
2b. Conjugate curves.
2c. Curvatures study with the Euler-Savary method.
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PRE-REQUISITE

"1. Basical kinematics of multibody systems [velocities determination]
2. Dynamics of multibody systems [theorems of newtonian mechanics, Lagrange's
equations]."