SYSTÈMES MÉCANIQUES POLYARTICULÉS

MULTI-BODY MECHANICAL SYSTEMS

Lecturers: **Emmanuel RIGAUD, Bertrand HOUX**

| Lecturers : 12.0 | TC : 12.0 | PW : 14 | Autonomy : 10 | Study : 0.0 | Project : 0.0 | Language : FR

Objectives

Multibody mechanical systems represent a wide spectrum of practical applications from industrial robots to many mechanisms (connecting rod-crank, automotive suspension, wiper, catenary, etc.).
The course presents and implement the general methods of description, modelling and analysis of multibody mechanical systems, as well as the the tools for the design and synthesis of these systems.
During the design office activities, the behavior of an industrial robot and an automotive wiper system are fully simulated and visualised.

Keywords : Robots, mechanisms, geometric model, kinematic model, dynamic model

Programme	- Architecture of an multibody mechanical systems and techological elements - Modeling of the multibody mechanical sydtem for open-loop kinematic chains: case of robotics (geometric, kinematic and dynamic models). - Closed-loop kinematic chains: case of mechanisms. - Robot design office + motor vehicle wiper design office.
Learning outcomes	• Know the technological elements and the rules for design of mechanical systems. • Master the geometric and kinematic modeling methods fof multibody mechanical systems. • Dynamic model: apply energcal methods to evaluate the forces required to activate multibody mechanical systems. • Implement numerical tools that allow simulation and visualization of the multibody mechanical systems behavior.
Independent study	Objectifs : Implement numerical tools that allow simulation and visualization of the multibody mechanical systems behavior. Méhodes : Exploitation of models in the dedicated digital environment in order to evaluate and summarize the performance of the mechanical systems modeled in the form of an illustrated report.
Core texts	KHALIL W., DOMBRE E., *MODÉLISATION, IDENTIFICATION ET COMMANDE DES ROBOTS* ., Hermès, 1999
Assessment	Final mark = 50% Knowledge + 50% Know-how Knowledge = 100% final exam Know-how = 100% continuous assessment