



## Faculty of Applied Sciences

### MECA2830 Aerospace dynamics.

[30h+30h exercises] 5 credits

This course is taught in the 1st semester

**Teacher(s):** David Johnson  
**Language:** French  
**Level:** Second cycle

#### Aims

Introduce students to the specific issues of aircraft dynamics, launcher systems and dynamics, and satellite dynamics.

#### Main themes

- Universal gravitation and applications.
- Aircraft dynamics : equilibrium, stability and control.
- Launchers.
- Satellite orbits and attitude stability.

#### Content and teaching methods

- Summary of rigid body mechanics.
- Aircraft dynamics : aerodynamic loads, translational and rotational dynamics, steady state motion, propulsion, stability, controls.
- Launcher dynamics and staging optimisation.
- Satellite dynamics : orbits, transfers, rendezvous, attitude stability.

#### Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

Prerequisites :

Analytical mechanics, applied mathematics.

References :

- B. ETKIN Dynamics of Flight - Stability and Control.
- L. GEORGE, J-F VERNET, J-C WANNER La mécanique du vol.
- J.W. CORNELISSE, H.F.R. SCHÖYER, K.F. WAKKER Rocket Propulsion and Spaceflight.

#### Other credits in programs

<b>ELME23/M</b>	Troisième année du programme conduisant au grade d'ingénieur civil électro-mécanicien (mécatronique)	(5 credits)
<b>INFO23</b>	Troisième année du programme conduisant au grade d'ingénieur civil informaticien	(5 credits)
<b>MAP22</b>	Deuxième année du programme conduisant au grade d'ingénieur civil en mathématiques appliquées	(5 credits)
<b>MECA22</b>	Deuxième année du programme conduisant au grade d'ingénieur civil mécanicien	(5 credits)
<b>MECA23</b>	Troisième année du programme conduisant au grade d'ingénieur civil mécanicien	(5 credits)