Title: Analysis of mechanisms and mechanical systems

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Indicative period: 28 February – 27 March 2024

ABSTRACT.

The role of engineers is rapidly changing in the new industry 4.0 framework and requires cross-functional and multidisciplinary knowledge and skills. Mechanisms are used to transmit forces and torques and to move objects. In this scenario, mechanisms have been and continue to be essential components of mechanical systems for industrial applications. Since the knowledge of kinematics is crucial for the design and control of kinematic chains, the course aims at presenting kinematics of mechanisms introducing students to a proper design of mechanisms.

PROGRAM

Rigid body mechanisms. Recalls on mechanisms: joints, architectures and topologies, analysis and synthesis.

Recalls on position analysis: generalities and examples of planar serial and parallel mechanisms.

Constraint analysis: joints, spatial serial chains and examples, planar single loop chains.

Velocity analysis: joints, spatial serial chains and examples, planar single loop chains.

Compliant mechanisms.

3D Modelling of mechanisms, movement analysis. Exercise with dedicated software.

Example project.