

Title: Analysis of mechanisms and mechanical systems

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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 and dynamics of mechanisms using example problems.

PROGRAM:

Basics of kinematics.

Degrees of Freedom and Motion Kinematics.

Fundamental properties of closed and open kinematic chains, problems of motion, degrees of freedom, joints, kinematic pairs, chains, and mechanisms. Kinematic Analysis of mechanisms: Position Analysis, Velocity and Acceleration Analysis, Dynamic Force Analysis.

Analysis and simulation methods to solve kinematic and dynamic problems of mechanical systems. Case studies.