Multi Body Dynamics and Robotics

Programme course

6 credits

Flerkroppsmekanik och robotik

TMMS30

Valid from: 2017 Spring semester

Determined by
Board of Studies for Mechanical Engineering and Design

Date determined
2017-01-25

Main field of study
Mechanical Engineering

Course level
Second cycle

Advancement level
A1X

Course offered for
- Mechanical Engineering, M Sc in Engineering
- Applied Physics and Electrical Engineering, M Sc in Engineering
- Mechanical Engineering, Master's programme
- Applied Physics and Electrical Engineering - International, M Sc in Engineering

Entry requirements
Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

Prerequisites
Basic courses in calculus, algebra and mechanics.

Intended learning outcomes
The course aims at giving the student knowledge of computer-aided methods for mechanical analysis of multibody systems, with robot arms as an important special case. After the course the should be able to:

- Model mechanisms using generalized, relative, absolute and natural coordinates.
- Perform kinematic and kinetic analyses of mechanisms.
- Implement smaller parts of solution algorithms in MATLAB.

Course content
Kinematics: Overview of different types of coordinates, kinematical constraints, analysis of position, velocity and acceleration. Kinetics: Euler's method. Robotics: Serial robots, the Denavit-Hartenberg notation, kinematic analysis.

Teaching and working methods
Teaching is in the form of lectures, classes and computer exercises.

Examination

UPG3	Assignments	6 credits	U, 3, 4, 5

Grades
Four-grade scale, LiU, U, 3, 4, 5

Department
Institutionen för ekonomisk och industriell utveckling

Director of Studies or equivalent
Peter Schmidt

Examiner
Peter Christensen

Course website and other links

Education components
Preliminary scheduled hours: 56 h
Recommended self-study hours: 104 h

Course literature
P. Christensen, Computational rigid body mechanics

Common rules

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at http://styrdokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.