

# 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 student 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://stydokument.liu.se/Regelsamling/Innehall/Utbildning\\_pa\\_grund-\\_och\\_avancerad\\_niva](http://stydokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva).