Computations with MATLAB

Programme course

4 credits

Matematiska beräkningar med MATLAB

TAIU07

Valid from: 2017 Spring semester

Determined by
Board of Studies for Mechanical
Engineering and Design

Date determined
2017-01-25

Main field of study

Mathematics, Applied Mathematics

Course level

First cycle

Advancement level

G1X

Course offered for

- Mechanical Engineering, B 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.

Intended learning outcomes

The course aims to give

- basic skills in using mathematical software for future courses where MATLAB is used
- an increased understanding of linear algebra and geometry

After finishing the course the student should be able to

- use built in MATLAB commands for mathematical computations and visualising computed results
- divide complex computational problems into subproblems, and formulate and implement computer algorithms for solving these problems

Course content

1. The basics
   MATLABs interface, variables, matrices, assignment, indexing with scalars
   and vectors, colon notation, static and dynamic memory allocation, basic
   arithmetics, elementwise operations and matrix operations, comformality,
   transpose, solving linear systems of equations
2. Visualisation and data processing
   Visualising curves, surfaces and time dependent objects, printing and
   exporting graphics, commands for generating vectors and matrices,
   mathematical constants and functions, curve fitting, complex numbers,
   random numbers
3. Algorithms and programming
   Dividing computational problems into subproblems, formulating
   algorithms, iteration and selection, programming in MATLAB, relational
   operators, boolean algebra, input and output, commenting programming
   code

Teaching and working methods

Lectures, exercises, assignments, tutorials and seminars.

Examination

UPG1	Hand-in assignments	2 credits	U, G
DAT1	Written examination	2 credits	U, 3, 4, 5

Grades

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

Department

Matematiska institutionen

Director of Studies or equivalent

Ingegerd Skoglund

Examiner

Fredrik Berntsson

Course website and other links

http://courses.mai.liu.se/GU/TAIU07

Education components

Preliminary scheduled hours: 42 h
Recommended self-study hours: 65 h

Course literature

P Jönsson, MATLAB beräkningar inom teknik och naturvetenskap, tredje upplagan, Studentlitteratur, 2010.

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.