

Schedule and Reading Instructions

Modelica Course at Linköping University

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Schedule

Day1: Wednesday, Oct 13, 9.15-17.00 (hint: Spend evening reading the course book)

Day2: Thursday, Oct 14, 10.15-17.00 (hint: Spend morning reading the course book)

Day3: Wednesday, October 20, 9.15-17

Day4: Wednesday, October 27, 9.15-17

Day5: Monday, Nov 8, 9.15-17

Approximately 28 hours including hands-on exercises.

Day1:

Lecture: Introduction to Modeling and Simulation with Modelica and OpenModelica

- OpenModelica OMNotebook usage

Introduction to textual modeling

Demo+Exercise: OMNotebook and DrModelica

Demo+short exercise: Graphic modeling with simForge

Lecture+Exercises: classes and inheritance

Exercise01-classes-simple-textual.onb

Lecture+Exercises: Component connectors and connections, graphical modeling

Exercise02-graphical-modeling.onb

Day2:

Lecture:Equations

Exercise03-classes-textual-circuit.onb

Lecture: Algorithms and functions

Exercise04-equations-algorithms-functions.onb

Lecture: Modelica Packages

Lecture: Modelica Libraries

Day3:

Lecture: Hybrid Systems

Exercise05-hybrid-discreteevent.onb

Lecture:Simple biological models

Exercise06-pop-dynamics-and-model-design.onb

Lecture:Model Design

Exercise06-pop-dynamics-and-model-design.onb

Lecture: Romeo and Julia

Day4:

Lecture+Exercises: Building a simple Modelica library.

A whole day will be devoted to designing and building a simple modelica library from scratch, primarily using the graphical user interface.

Day5:

Lecture+Exercises:

- Introduction to the OpenModelica Eclipse plugin
- Simple simulation exercise using the Eclipse plugin.

Lecture+Exercises:

Introduction to MetaModelica

- Functional programming in MetaModelica
- Model transformations and symbolic programming
- Simple model transformation exercise in MetaModelica.

Lectures:

Introduction to the OpenModelica compiler

- Structure, information about modules, etc
- The model manipulation and information retrieval API.
- Corba connection to OMC

Advanced OpenModelica compiler development topics

- How to adapt code generator to specific needs,
- How to access the flat Modelica intermediate form,
- Programming AST transformations in the compiler
- How to add simple functionality to the compiler

Reading Instructions

The following are reading instructions for the course book Principles of Object Oriented Modeling and Simulation with Modelica 2.1.

You need to read this well enough to be able to sign a paper where you promise that you have read all the included at a level to understand approximately 95% of the included material.

There will be some sampled oral examinations to check this.

Included in the course:

Chapter 1, whole chapter.

Chapter 2, whole chapter.

Chapter 3: Sec 3.1 - 3.13.1, 3.13.3 - 3.14.7

Chapter 4, whole chapter.

Chapter 5: 5.1 - 5.4.0; 5.4.3 - 5.7.2; 5.8

Chapter 6: 6.1 - 6.8.0;

Chapter 7: 7.1 - 7.2.2

Chapter 8: 8.1 - 8.4.1.3

Chapter 9: 9.1 - 9.3.2.6

Chapter 10: whole chapter.

Chapter 11: not included.

Chapter 12: whole chapter.

Chapter 13: 13.1 - 13.2.5.5; 13.2.5.7 - 13.2.6.5; 13.3.0 - 13.3.4; 13.4.1; 13.5

Chapter 15: 15.1.0; 15.4.1; 15.5; 15.6.0-15.6.2; 15.7; 15.10.2-15.10.3

Chapter 17: 17.1.0, 17.1.4, 17.1.5, 17.1.6,

Chapter 18.1, 18.2.0, 18.2.1, 18.2.1.1

The following are reading instructions for included parts of the “Modelica Meta-Programming and Symbolic Transformations - MetaModelica programming guide”:

Chapter 1: whole chapter.

Chapter 2: Sec 2.0, 2.1, 2.2

Chapter 3: Sec 3.0, 3.1.5, 3.3

(We will have selected exercises, partly from the Appendix of the MetaModelica programming guide)