INTRODUCTION TO THE VEHICLE DYNAMICS LIBRARY

Course overview

DAY 1

Vehicle Dynamics Library Introduction

- Lecture 1   Overview of VDL and its contents
  - Workshop 1

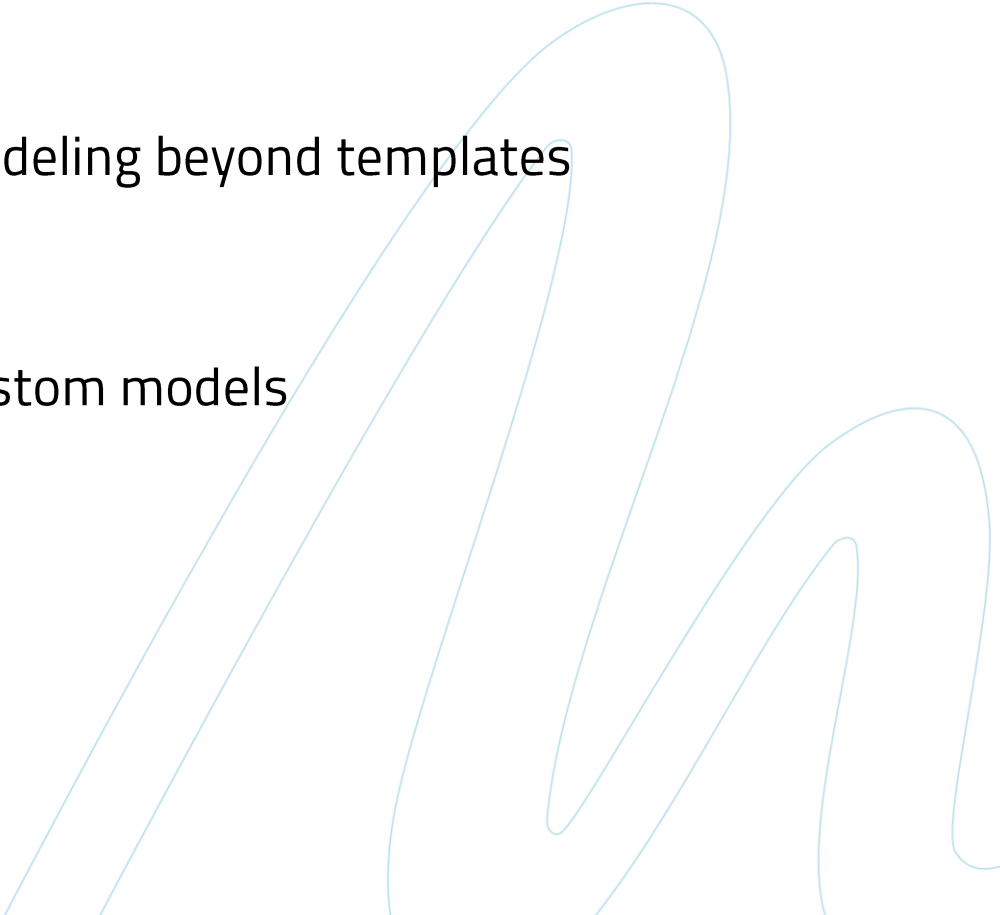- Lecture 2   Setting up full vehicle experiments
  - Workshop 2

- Lecture 3   Constrained testing and export
  - Workshop 3

DAY 2

Vehicle Dynamics Library Introduction

- Lecture 4   Configuring template-based models
  - Workshop 4

- Lecture 5   Modeling beyond templates
  - Workshop 5

- Lecture 6   Custom models
  - Workshop 6

Overview of VDL and its contents

Lecture 1

Overview

- What is VDL?
- Overview of the library contents
  - Vehicle, and vehicle subsystems
  - Chassis and chassis components
  - Geometric and tabular suspensions
  - Steering systems, wheels and tires
  - Engine, transmission and brake subsystems
  - Drivelines and hybrid powertrains
  - Driver and environment
- The VDL options

*Modelon_*

Setting up full vehicle experiments

Lecture 2

Overview

- Configuring a full vehicle experiment
- Creating 3D roads
- Configuring driver models
- Open and closed loop testing
- Active systems, sensor, actuators

Constrained testing and export

Lecture 3

Overview

- Constrained and subsystem testing
  - Suspension tests, K&C analysis
  - Tire tests
  - Steady state analysis
- Interfacing with Simulink
- Real-time simulation

Configuring template-based models

Lecture 4

Overview

- Configuring vehicles
- Configuring subsystems
  - Chassis
  - Suspension
  - Driveline
  - Powertrain
- Constructing user-defined templates

Modeling beyond templates

Lecture 5

Overview

- The use of base classes
- Defining own component models based on drag and drop
- Incorporating user defined components in existing templates
- Managing signal flow using the signalBus

Custom models

Lecture 6

Overview

- Modifying tire models
- Incorporating custom tire models
- Custom road and ground definitions
- Custom experiments