Lecture schedule 2017

TTK4130 Modeling and Simulation

April 23, 2017

Week	Date	Theme	Literature
2	10.01	Introduction to Modelica	F: 1, 2
	12.01	More introduction. State-space models, transfer functions.	E: 1.1-1.3, 2.1-2.2
		Modeling software, network models.	(E:1.4-1.5)
3	17.01	Energy functions, passivity	E: 2.3-2.4
	19.01	More passivity	E: 2.4
4	24.01	Modeling of complex systems. Simulation: Order, test system	F: 3, 4, E: 14.1-14.2
	26.01	Explicit Runge-Kutta methods	E: 14.3-14.4
5	31.01	Electrical motors	E: 3.1-3.4
	02.02	Implicit Runge-Kutta methods	E: 14.5
6	07.02	Stability, Padé approximations	E: 14.6
	09.02	Stability, frequency properties, automatic step size adjustment	E: 14.6-14.7
		Implementation, BDF and differential-algebraic systems	E: 14.8, 14.11, 14.12
7	14.02	Hydraulic motors, transmission lines	E: 4.1-4.6
	16.02	Friction	E: 5
8	21.02	Vectors, dyadics, rotation matrices	E: 6.1-6.4
	23.02	Euler angles, angle axis	E: 6.5-6.6
9	28.02	Euler parameters, angular velocities	E: 6.7-6.8
	02.03	Kinematic differential equations	E: 6.9
10	07.03	Kinematics of a rigid body , Newton-Euler equations of motion	E: 6.12-6.13, 7.3
	09.03	Newton-Euler equations of motion, Modelica.Multibody	E: 7.3
11	14.03	Lagrange equations of motion	E: 7.7, 8.1-8.2
	16.03	Lagrange equations of motion, recap, examples	
12	21.03	Process modelling and balance laws, I	E: 10.4, 11.1-4 (+ slides)
	23.03	Process modelling and balance laws, II	E: 10.4, 11.1-4 (+ slides)
13	28.03	Guest lecture: Erlend Kristiansen, Comsol Multiphysics	
	30.03	No lecture (excursion)	
14	04.04	No lecture (excursion)	
	06.04	No lecture (excursion)	
15	11.04	No lecture (Easter)	
	13.04	No lecture (Easter)	
16	18.04	No lecture (Easter)	
	20.04	Process modelling and balance laws (differential balance)	E: 10.4, 11.1-4
17	25.04	Process modelling and balance laws (closure relations)	E: 10.4, 11.1-4
	27.04	No lecture (TTK4135 lab.rapport)	
18	02.05	Discussion: Exam 2016 (+Review)	
	04.05	No lecture	

E: "Modeling and Simulation for Automatic Control" by O. Egeland and J.T. Gravdahl

F: "Introduction to Modeling and Simulation of Technical and Physical Systems with Modelica" by P. Fritzon