Course Plan

Course name	***Simulation Summit***
Course code	Ene-58.5181
Status of course	For study plan for doctoral degree or HVAC master major
Responsible teacher	Prof. Risto Kosonen
Other teacher	Mika Vuolle, Sven Moosberger
Teaching period(s)	
Starting (year)	2018
Varying contents	No
Credits (cr)	2 cr
Workload	Contact hours (32 h): • Lectures 16 h • Exercises 16 h Independent work (24 h): • Exercises 8 h • Group exercise report 16 h Total 56 h
Learning outcomes	- has an extraordinary deep understanding of building simulation models for indoor climate and energy - knows methods for optimization towards arbitrary goal functions - understands the dynamic behavior of a building coupled with its HVAC and control system
Content and teaching methods	Contact teaching lectures and exercise: - Plant modelling - Complex controls - Sensitivty and certainty analysis - The mathematical model of a building Group exercise: - Modelling and optimizing a coupled system of a building with its plant and control system
Core content analysis	Must know: • How to model a plant with mass flow driven circuits in an equation based simulation environment • Can create user defined control that behave as intended • Can estimate what the most relevant inputs of a building simulation model are

	Should to know: • What it means to create a plant model that is numerically complete • How controls can be numerically optimized and stabilized • Create meaningful goal functions use them for building optimization
Assessment method and criteria	• Calculation exercises 50 % • Individual report of what was done in the group exercise 50 % Scale 0-5; ~50 % of the maximum points are required for grade 1
Literature	Lecture notes, guides, exercises Background material: General: Models for Building Indoor Climate and Energy Simulation Lecture 1: Local heating and cooling units Lecture 2: Plants and its components Lecture 3: Air Handling Units and its components Lecture 4: Controls Lecture 5: Parametric run
Replaces (if applicable)	
Prerequisites (if applicable)	
Grading	-
Language of instruction	English
Additional info (if applicable)	