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Lappeenranta University of Technology

Course	**Simulation Modelling in Industrial Management, 3 ECTS credits**
Year and period	M.Sc. 1-2, 7-11.8.2017
Teacher(s)	Post-Doctoral Researcher Samuli Kortelainen, LUT
Person(s) in Charge	Post-Doctoral Researcher Samuli Kortelainen, LUT
Additional information	The number of course attendants is limited to 20. The course teacher selects 20 students after the course registration is over.
Aims	Learning outcomes: The amount of data available for decision makers is constantly increasing. The increase of data enables new opportunities for managers, but also creates a demand to develop systems that can generate this data into usable intelligence. Simulation techniques offer interesting option for managers to better understand and develop firm's business processes. The key simulation skills that the student has to possess after successful completion of the course: - Understanding on what system and complexity theories mean, and what are their business implications - Capability and design simulations model with a systematic process - Understand the possibilities, but also restrictions, of simulation modelling as an analysis tool - Practical simulations skills with the three most common simulation methods o System dynamics o Discrete event simulation o Agent based modelling - Skill to use simulation models to conduct tests on system performance
Content	This course is designated to explore two critical aspects of simulation modelling to business management: - The analysis and development of already existing processes - The analysis and testing of new proposed process First, the natural way to use simulation modelling is to model the firm's current operations. The goal in this kind of simulation is to understand and then develop firm's processes to perform better. As such, simulation offers an opportunity to support management of

	firm's operational processes. During the course, this methodology is used to simulate firm's manufacture processes, but also more abstract service processes. The second way to utilize simulation is to model future processes. This enables testing the effect of a new innovation to a given process. This allows analysis on the true value of an innovation and thus supports management of innovations. This application area is the focus of later part of the course.
Modes of Study	The teaching is dominantly interactive workshop in small groups supported by in-class lectures. In addition there is a pre-course essay for the course, which has 3 questions. Expected length is 20 pages. - In-class teaching 6 hours - Workshop + learning diary at the end of each lecture day 24 hours - Pre-course work 48 hours Total workload 78 hours **Maximum course attendants is 20 persons. Final student selection is made by the teacher after the registration is over.**
Evaluation	Final grade 0-5. Evaluation: - essay 60 % - learning diary 40 %
Study Materials	Course slides to be distributed during the course.
Prerequisites	- Previous studies in management are strongly suggested - Skills that assist learning o Basic Excel and coding skills o Good skills in logical thinking o Basic math skills o Positive attitude