

MEC-E7001 Production systems modelling

Contents (Oodi):

The following methods are studied: simulation¹, queuing models, optimization, regression analysis, and neural networks.

Application of the methods to production systems planning and control: hierarchical production planning, cost functions, Little's law, scheduling, lot sizes and set-ups, capacity planning, aggregate planning, facility location. The basics of the methods and software are learned in guided tutorials (computer classes) and exercises (assignments).

¹ On course MEC-E1080 Production engineering

General arrangements

- Lectures are given in Teams on Tuesdays 8.15 - 9.45 and Thursdays 14.15 - 15.45 during period III
- Computer classes take place in Teams 14:15-16:00 on Fridays 22.1., 29.1. and 12.2.
- Four project assignments are done in groups of 2 students. Group formation is free.
- Computer classes and assignments deal with the following topics:
 1. Optimisation with Excel/Solver and/or OpenSolver
 2. Linear regression and neural networks (Excel, Matlab)
 3. Optimisation with CPLEX
- Grading
 - Assignments max. $4 \times 10 = 40$ points
 - Examination max $4 \times 5 = 20$ points

Assignments

1. Factory and production allocation optimisation using Excel Solver and/or OpenSolver - 22.1.2021
 2. Data fitting using Excel and Matlab Neural Network toolbox - 29.1.2021
 3. Flow shop optimisation using CPLEX - 12.2.2021
 4. Aggregate planning using CPLEX
- The first three assignments will be introduced during computer classes
 - A report is written and submitted in MyCourse before dead line, which is about two weeks from the date of the computer class
 - Grades: 1 – experiments done and reported, 6 – good report and analysis, 10 – good report and analysis and given additional study done

Assignments

