MEC-E7001 Production systems modelling

Contents (SISU):

The following methods are studied: simulation[1], 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

esko.niemi@aalto.fi

General arrangements

- Lectures are given in U351 on Tuesdays 8.15 - 9.45 and in K1/215 on Thursdays 14.15 - 15.45 during period III
- Computer classes take place in Maari-C 14:15-16:00 on Fridays 19.1., 26.1. and 2.2.
- Four project assignments are done in groups of 3 students. Group formation is free.
- Computer classes and assignments deal with the following methods and tools:
    1. Optimisation with Excel/Solver and/or OpenSolver
    2. Linear regression and neural networks (Excel, Matlab)
    3. Optimisation with CPLEX
- Grading
    - Assignments max. 4 x 10 = 40 points
    - Examination max 4 x 5 = 20 points

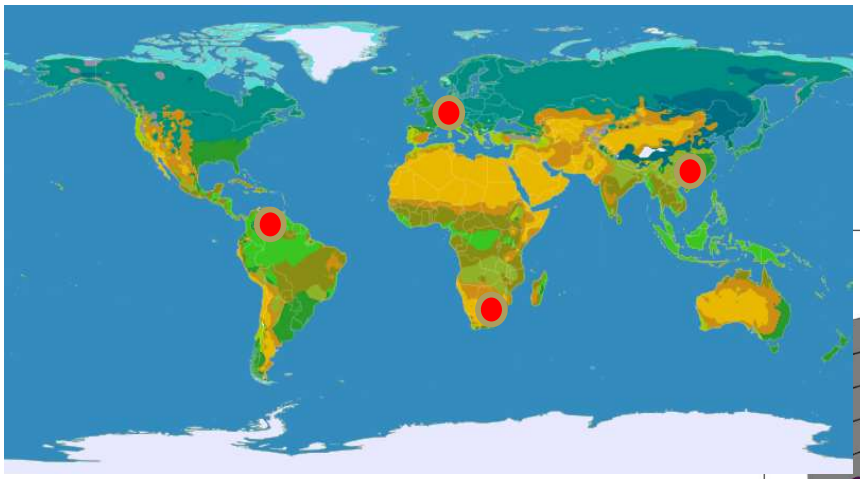
esko.niemi@aalto.fi

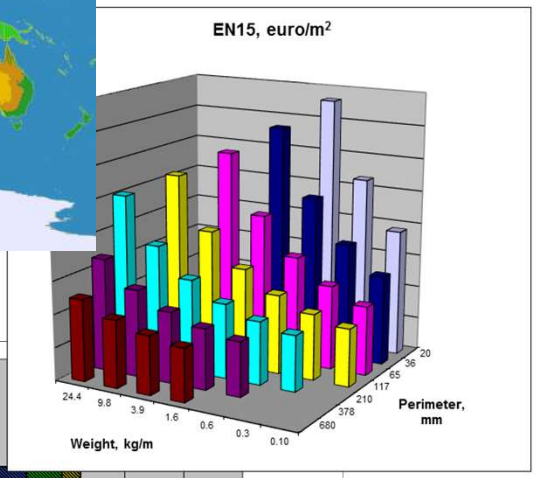
Assignments – intro in computer classes

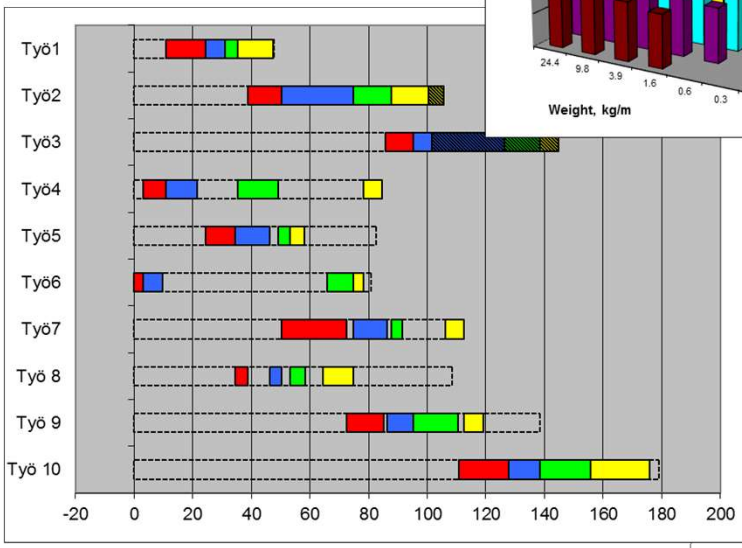
1. Factory and production allocation optimisation using Excel Solver and/or OpenSolver - 19.1.
2. Data fitting using Excel and Matlab Neural Network toolbox - 26.1.
3. Flow shop optimisation using CPLEX - 2.2.
4. Aggregate planning using CPLEX – Lecture on 15.2.

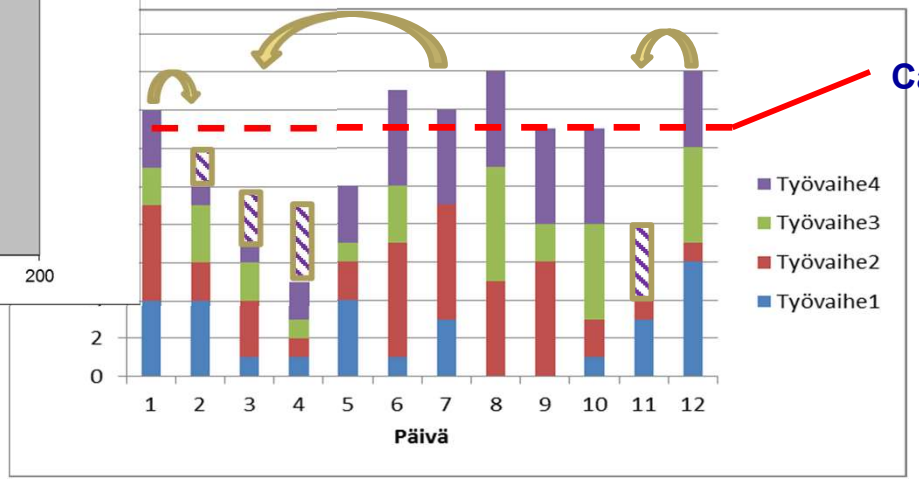
- The first three assignments will be introduced during computer classes
- A report is written and submitted in MyCourses before deadline, which is about two weeks from the date of the computer class
- Grading 1 – 10. See MyCourses for evaluation criteria.

Assignments









esko.niemi@aalto.fi