



## COURSE SYLLABUS

# Production Development II, Methods and Tools, 7.5 credits

*Produktionsutveckling II, metoder och verktyg, 7,5 högskolepoäng*

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<b>Course Code:</b> T2PS27	<b>Education Cycle:</b> Second-cycle level
<b>Confirmed by:</b> Dean Feb 1, 2017	<b>Disciplinary domain:</b> Technology (95%) and social sciences (5%)
<b>Valid From:</b> Aug 1, 2017	<b>Subject group:</b> MT1
<b>Version:</b> 1	<b>Specialised in:</b> A1F
<b>Reg number:</b> JTH 2017/443-313	<b>Main field of study:</b> Production Systems

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### Intended Learning Outcomes (ILO)

After a successful course, the student shall

Knowledge and understanding

- display knowledge of the concept of productivity and its underlying factors
- demonstrate comprehension of how production systems are realized and deployed
- demonstrate comprehension of methods and tools for system modelling, design and analysis

Skills and abilities

- demonstrate skills of applying different methods and tools for the design of production systems
- demonstrate skills of applying basic multi-objective optimization for production system development
- demonstrate the ability to identify and calculate critical factors for enhancing productivity

Judgement and approach

- demonstrate the ability to evaluate various technological and layout choices' impact on the production system
- demonstrate the ability to compare the pros and cons of various tools for production systems development

### Contents

The course is a natural follow up to Production Development I. It deals with methods and tools for production system modelling, design and analysis. The course further deals with productivity as a concept and its various components are highlighted. The aim is to increase productivity and efficiency through a better design of production systems and during its operational phase. The course also provides insight into how to use simulation and optimization techniques for experimenting, analyzing and verifying production system performance and improvements in a virtual environment. System view and different perspectives are essential starting points. An important part of the course is an industrial project, where the students new gained understanding and methodological approaches are expected to become manifested.

The course includes the following elements:

- Analysis of production strategies
- Implementation of production strategies
- Design of production systems including systems and process perspective, sustainability, production philosophies, layout, workplace design and organizational solutions
- Flow simulation and other tools for system design
- Time studies, balancing and flow optimization
- Various tools for process and capacity analysis
- Various technological choices' impact on the production system
- Evaluation of production systems

### **Type of instruction**

Lectures, exercises and project work.

The teaching is conducted in English.

### **Prerequisites**

Passed courses at least 90 credits within the major subject in Mechanical Engineering, Industrial Engineering and Management or Civil Engineering, and 15 credits Mathematics, and completed course Production Development I, Strategy and System, 7,5 credits. Proof of English proficiency is required (or the equivalent).

### **Examination and grades**

The course is graded 5,4,3 or Fail.

The final grade is weighted from the results of the written examination and the project. The final grade will only be issued after satisfactory completion of all assessments.

Registration of examination:

Name of the Test	Value	Grading
Examination	2 credits	5/4/3/U
Project	4 credits	5/4/3/U
Exercise	1.5 credits	U/G

### **Course literature**

The literature list for the course will be provided one month before the course starts.

Title: Production Development - design and operation of production systems

Author: Bellgran, M., Säfsten, K.

Publisher: Springer-Verlag, London.

ISBN: 978-1-84882-494-2