



Syllabus for

P42 – Advanced Production Systems

Credits 7.5

Examiner Christina Windmark

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Target group PhD students and other academic researchers and industrial employees with a general interest in the development and analysis of production systems and manufacturing costs.

Prerequisites Insights and knowledge on manufacturing processes.

Aim

The aim of the course is to increase participants understanding of production systems and to be able to make knowledgeable decisions within the area. The participants will also learn how to make production analyses including disturbances tracking, production cost estimations and link manufacturing costs to technology issues.

About the teachers



Christina Windmark is a Researcher in Manufacturing economics and production systems at the Division of Production and Materials Engineering, Lund University. She did her doctoral degree in economical decision support from the manufacturing industry in 2018. Currently she is the coordinator for the master Program in Production and Materials Engineering and works as a teacher in courses of manufacturing systems where technology and economy intersect. She is also working as project leader in a project aiming to increase the knowledge and skills at SME in manufacturing of parts for infrastructures as ESS, MAX IV and CERN.



Jan-Eric Ståhl is a Professor in Production Technology and Production Systems at the Division of Production and Materials Engineering, Lund University. His research has been within production processes material behaviours and manufacturing systems. He is the project leader of the Horizon2020 project Flintstone that aims to replace Critical Raw Materials in cutting tools. He has published several books within metal cutting and production systems. He took the initiative and was one of the founders to the Swedish Production Academy.



Fredrik Schultheiss is an Assistant Professor in Production Technology and Production Systems at the Division of Production and Materials Engineering, Lund University. He is also the Program Director for Mechanical Engineering at Lund University. His research has been within production processes with a doctoral thesis on the machinability of ductile and strain hardening materials. He is the project leader for EvoChip, funded by Mistra Innovation, a project aimed at developing an efficient recycling method for brass chips.

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Fee for industrial members

7 000 SEK

Learning outcomes

After completion of the course, the participants will be able to:

Knowledge and understanding

- Master and apply basic economic theory for creation of production development strategies.
- Master the calculation principles for the manufacturing cost in one production section where all essential factors are considered and have knowledge of various key figures that describe the performance of a production system.
- Master the management and adaptation of collected production data for economic models.
- Be able to describe tools and principles for continuous production development including those based on Lean Production and Next Step.
- Understand the requirements for a sustainable manufacturing system.
- Have insight and understanding of how to evaluate various manufacturing systems, including the relation to the field of industrial purchasing.

Competence and skills

For an approved course the student must

- Be able to analyse economically and propose ways for different production development scenarios.
- Practically be able to plan, setup and implement a systematic production analysis.
- Be able to assess different types of production systems from technical and economical perspective as well as in regards to sustainability.

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Contents

This course includes:

- History and introduction to production systems
- Layouts and configurations of production systems
- Manufacturing costs and KPIs
- Systematic production analysis
- Production development theories
- Cost for material handling and production systems
- Efficient production
- Sustainable production development
- Integrated product industrialization

Organisation

The course is divided into 3 course sessions

Literature

Course material will be provided, in pre-print copies of the book "Viable Production Systems – Global industrial economy and technology" Jan-Eric Ståhl and Christina Windmark

Examination

Individual written examination and three individual mandatory assignments.

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