Applied Planning and Control in Operations Management

Tillämpad planering och styrning av produktionsverksamhet
6 credits

Programme course

TPPE83

Valid from: 2022 Spring semester

Determined by	**Main field of study**	
Board of Studies for Industrial Engineering and Logistics	Industrial Engineering and Management	
Date determined	**Course level**	**Progressive specialisation**
2021-09-01	Second cycle	A1X
Revised by	**Disciplinary domain**	
	Social sciences	
Revision date	**Subject group**	
	Industrial Engineering and Management	
Offered first time	**Offered for the last time**	
Autumn semester 2022		
Department	**Replaced by**	
Institutionen för ekonomisk och industriell utveckling		

Course offered for

- Master's Programme in Industrial Engineering and Management

Prerequisites

Calculus, Mathematical statistics, Basic course in Manufacturing Planning and Control

Intended learning outcomes

After taking this course, the student should be able to:

- make a theoretical correct choice of advanced methods and techniques in planning and control in different industrial environments.
- apply advanced methods and techniques in planning and control in different industrial environments.
- analyze and evaluate methods and techniques in planning and control different industrial environments.
- relate advanced methods and techniques in planning and control to other functions of the industrial enterprise.
- be able to use commercial ERP system applications and explain the main functionality.
- explain and exemplify basic knowledge about the latest development in digitalization and how digitalization can be efficiently used in different industrial environments.
- explain and exemplify basic knowledge about sustainability in different industrial environments.

Course content

Manufacturing Planning and Control is the backbone of the operations in any service or manufacturing company. In today's global competition and digital environment, new methods and techniques for planning and controlling manufacturing has emerged. Traditional methods and techniques in planning and control are however still dominating the industry. This course is therefore structured in line with the four existing management paradigms, where two are classified as owner driven and financials based, and two as customer driven and value based.

1. The first paradigm covers efficiency-based management, with e.g. Manufacturing Resource Planning (MRPII) including Material Requirements Planning (MRP). This paradigm contains customer order handling in Master Production Scheduling (MPS) and capacity planning at all levels in MRPII.
2. The second paradigm cover constraints-based management with e.g. Theory of Constraints (TOC) and Drum-Buffer-Rope (DBR). This paradigm contains on hands planning in DBR.
3. The third paradigm covers lean-based management with e.g. rate based scheduling and contains the use of Mixed-Model-Scheduling in the Final Assembly Scheduling.
4. The last and fourth part covers agility-based management.

Each paradigm incorporates advanced level methods and techniques, but also the latest developments in digitalization and sustainability. How to use Artificial Intelligence and Enterprise Resource Planning systems in each management paradigm is discussed together with the impact on sustainability.

Finally, so called hybrid systems are covered where methods from the different management paradigms are combined to fulfill more complex requirements from an operations strategy perspective.

Teaching and working methods

The course is divided into three parts. Part 1 is theoretical and lecture based, creating advanced level knowledge of the four management paradigms. This part is tested with a written examination (TEN1) and graded (U, 3, 4, 5).

Part 2 includes a teaching case that runs throughout the whole course, incorporating each of the management paradigms. Students test the advanced knowledge in the theoretical part of the course in a practical case to clearly see the usefulness in an industrial setting. This part is examined with a written report, answering the questions raised by the case. The report examined as (UPG1) and graded (U, 3, 4, 5).

The third part is a set of laboratory exercises in a commercial ERP system used in cooperation with industry. This part is examined with mandatory laboratory sessions. The laboratory sessions are examined as (LAB1) and graded (U, G).

Examination

TEN1	Written examination	2 credits	U, 3, 4, 5
UPG1	Case report	2 credits	U, 3, 4, 5
LAB1	Laboratory work	2 credits	U, G

The final grade is an average of TEN1 and UPG1 where the grade is rounded off down to the nearest integer.

Grades

Four-grade scale, LiU, U, 3, 4, 5

Other information

About teaching and examination language

The teaching language is presented in the Overview tab for each course. The examination language relates to the teaching language as follows:

- If teaching language is “Swedish”, the course as a whole could be given in Swedish, or partly in English. Examination language is Swedish, but parts of the examination can be in English.
- If teaching language is “English”, the course as a whole is taught in English. Examination language is English.
- If teaching language is “Swedish/English”, the course as a whole will be taught in English if students without prior knowledge of the Swedish language participate. Examination language is Swedish or English depending on teaching language.

Other

The course is conducted in a manner where both men's and women's experience and knowledge are made visible and developed.

The planning and implementation of a course should correspond to the course syllabus. The course evaluation should therefore be conducted with the course syllabus as a starting point.

If special circumstances prevail, the vice-chancellor may in a special decision specify the preconditions for temporary deviations from this course syllabus, and delegate the right to take such decisions.