



## Syllabus for



# P04 – Cloud-Based Cyber-Physical Systems in Manufacturing

<b>Credits</b>	6 credits
<b>Examiner</b>	Xi Vincent Wang, Royal Institute of Technology
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<b>Target group</b>	Professionals and doctoral students who want to learn more about Cloud, Cyber-Physical Systems in Production.
<b>Prerequisites</b>	The participants need to have basic knowledge and experience with Production Systems.
<b>Aim</b>	The course aims to provide knowledge about modern technologies in production systems. Different technologies are introduced from the production's perspective with real-life examples and case studies.

**Teachers/tutors** Xi Vincent Wang; Lihui Wang; Abdullah Alhusin Alkhdur

**Learning outcomes**

Upon successful completion of the course, participants should be able to:

- Apply and explain, with increased awareness, on how relations are important for modern ICT technologies for production systems.
- Describe how a cyber-physical system is established and utilized in the production environment, via monitoring, even-driven control, and predictive maintenance.
- Explain how the ICT technologies can support sustainable manufacturing in terms of energy efficiency, human safety, cyber security, and human-robot collaboration.
- Describe a cyber-physical system's architecture, standards and utilisation from the Internet of Manufacturing Things' perspective
- Understand and reason about, with increased awareness on, how to position the individual research area in a wider context of sustainable production

**Contents**

The course consists of 4 important parts:

- Part 1: Literature Survey and Trends
- Part 2: Cloud-Based Monitoring, Planning and Control in CPS
- Part 3: Sustainable Robotic Assembly in CPS Settings
- Part 4: CPS Systems Design and Lifecycle Analysis.

**Organisation**

The course is organized around 4 meetings at the same locations in Sweden, each meeting lasting 1 days.

**Literature**

Wang L, Wang XV (2018) Cloud-Based Cyber-Physical Systems in Manufacturing. doi: 10.1007/978-3-319-67693-7

Additional literature will be the latest journal papers and also highly rated journals as a baseline.

**Examination**

3 short essays, 2 individual and 1 group.

With support from:



The image shows four logos in a row. From left to right: VINNOVA (green and white), Swedish Energy Agency (red and black), formas (blue and white), and STRATEGIC INNOVATION PROGRAMMES (blue and white).