Course syllabus for

P04: Cloud-Based Cyber-Physical Systems in Manufacturing

Syllabus adopted 2018-06-21 by Professor Bengt-Göran Rosén, Produktion2030 Head of Education

Credits	6 hec
Grading scale	Satisfactory/not satisfactory
Education cycle	Third-cycle
Examiner	Assistant Professor Xi Vincent Wang, KTH Royal Institute of Technology
Eligibility	A Master's degree in production engineering or equivalent
Prerequisites	The participants need to have basic knowledge and experience with Production Systems.
Aim	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.
Intended learning outcomes	After completion of the course the course participant 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

Course content	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.
Course organisation	The course is organized around 4 meetings at the same locations in Sweden, each meeting lasting 1 days.
Examination	A successful completion of this course will be judged on 3 short essays, 2 individual and 1 group.
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.