Industrial process development, autumn 2016

Study guide

Welcome to the course PPU413, Industrial Process Development. This study guide is intended to inform and guide you on what to expect and how to approach the course. I hope the guidance provided in this document will be helpful in achieving the study goals you have for this course. I recommend that you read this guide as soon as possible so that you see what to expect, and plan your studies in a sufficient way. Further I recommend that you search and download each paper/article in due time so you can read them before the relating lecture. If you, for some reason not can participate on the course start on November 8th, you have to notify me in advance. Otherwise you risk loosing your registration on this course. I am looking forward to see you on November 8th.

Antti Salonen
Ph.D, Senior lecturer

Course code: PPU413

Course responsibility: Antti Salonen

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Examiner: Antti Salonen

Literature (Preliminary):

Chen, J., Li, Y. & Shady, B., (2010), "From value stream mapping toward a lean/sigma continuous improvement proves: an industrial case study", International Journal of Production Research, Vol. 48, No 4 , pp. 1069-1086

Bengtsson, M. & Osterman, C., (2014), "Improvements in vain – The 9th waste", The 6th International Swedish Production Symposium 2014, Göteborg, Sweden, Editor(s): Stahre, J., Johansson, B., and Björkman, M.

Susilawat, A., Tan, J., Bell, D., and Sarwar, M., (2013) "Develop a Framework of Performance Measurement and Improvement System for Lean Manufacturing Activity", International Journal of Lean Thinking, Vol. 4, Issue 1, pp. 51-64.

Bellgran, M.; Yamamoto, Y., (2010), "Fundamental mindset that drives improvements towards lean production", Assembly Automation, Vol. 30, No. 2 , pp. 124-130

Bengtsson, M. & Salonen, A. (2016). "Requirements and Needs – A foundation to reducing maintenance-related waste", Published at 10th World Congress on Engineering Asset Management (WCEAM 2015), Tampere, Finland.

The last two articles are not available through open data bases, but will be provided through the course web page.

The PowerPoint presentations from each lecture will be available in PDF format as additional teaching material. Also, files with study questions, SQ, will be provided for your convenience. Various additional documents may be included in the course.

Webpage: http://zoomin.idt.mdh.se/course/ppu413 Will be set up soon!

Learning objectives:

Student shall show ability to:

- applying modern tools and methods to improve the efficiency of manual and mechanical processes in production and logistics systems
- analyze and evaluate problems in production / logistics system processes, and develop action and improvement plans
- demonstrate the ability to be able to map a process, identify and quantify their loss, find the root causes of the loss, as well as provide suggestions for improvement with a simplified investment analysis

Examination:

- Project (Pro2): 5 credits: An applied industrial project
- Written exam (Ten1): 2.5 credits

Lecture plan (Preliminary)

2016-11-08: Lecture 1 – Introduction

- Guest lecture: Time studies (Associate professor Peter Almström, Chalmers)
- Setting up project groups

2016-11-11: Lecture 2 – Introduction

- Main lecturer: Antti Salonen, Mdh
- Startup of group assignments

2016-11-15: Lecture 2 – Industrial Process Development

- Main lecturer: Antti Salonen, Mdh
- Literature seminar: *Chen, et.al. 2010*

2016-11-18: Lecture 4a – PULSE-meeting 1

- Project specification

Lecture 4b – Quality development

- Main lecturer: Antti Salonen, Mdh
- Literature seminar: *Bengtsson & Osterman, 2014*

2016-11-22: Lecture 5 – Performance measures

- Main lecturer: Antti Salonen, Mdh
- Literature seminar: *Susilawati, et.al., 2013*

2016-11-25: Lecture 6 – Change management

- Guest lecturer: Lina Stålberg, Volvo CE
- Literature seminar: *Bellgran & Yamamoto, 2010*

2016-11-29: Lecture 7a – PULSE-meeting 2

- Definition of the studied process

Lecture 7b – Ergonomics

- Main lecturer: Antti Salonen

2016-12-02: Lecture 8 – Production system development

- Main lecturer: Associate professor Jessica Bruch, Mdh
- Guest lecture: Computer simulation of production systems, Erik Flores Volvo CE

2016-12-06: Lecture 9 – Maintenance development

- Main lecturer: Antti Salonen, Mdh
- Guest lecturer: Marcus Bengtsson, Volvo CE
- Literature seminar: *Bengtsson & Salonen, 2016*

2016-12-09: Lecture 10a – PULSE-meeting 3

- Current status of the process

Lecture 10b – Root Cause Analysis

- Main lecturer: Antti Salonen

2016-12-13: Lecture 11 – 6 sigma based improvements

- Guest lecturer: Shibly Ahmed, Volvo CE

2016-12-16: Lecture 12a – PULSE-meeting 4

- Root Cause Analysis

Lecture 12b – Investment assessment

- Main lecturer: Antti Salonen, Mdh

2016-12-20: Lecture 13 – Project presentations

- Final presentations
- Course evaluation

Applied industrial project

A major part of this course is the applied industrial project. During the course period you will perform a pre-study in an industrial setting. The aim of your pre-studies is to identify and quantify waste, and further to identify root causes of these problems and give suggestions on how to eliminate them.

Example of projects:

- Low capacity/utilization in a production cell.
- Low capacity/utilization in an assembly line.
- Poor quality from a production unit.
- Low availability of a machine/cell.

The pre-study shall be documented in a technical report and presented at a mandatory seminar on December 20th.