Reg No: HNT 2014/83:15

Faculty of Health, Science and Technology
Mechanical and Materials Engineering

Syllabus

Course Approval
The syllabus was approved by the Faculty Board of Health, Science and Technology on 22 October 2014 , and is valid from the Spring semester of 2015 at Karlstad University.

Course Code: MSGB39
Manufacturing System I, M, 7.5 ECTS Credits
(Produktionssystem I, M, 7.5 Swedish credit points)
Degree Level: Bachelor
Progressive Specialisation: G2F (First cycle, has at least 60 credits in first-cycle course/s as entry requirements)

Language of Instruction
Swedish

Prerequisites
Mechanical Engineering 45 ECTS cr including mechanics, solid mechanics, materials engineering, design engineering and manufacturing engineering, or equivalent.

Major Field of Study
MTA (Mechanical Engineering)

Learning Outcomes

Upon completion of the course, students should be able to:
production system, generally
- give an account of how production can be regarded in a systems perspective
- give an account of industrial basic ideas of the sustainability of a technical and production system in terms of environmental, social and economic perspectives.

The control and organisation of the production system
- give an account of the most common forms of manufacturing company's organisation
- give an account of the various forms of workshop layouts and flow of materials
- describe the production preparation process in a manufacturing company
- give an account of central concepts in production logistics and stock control
- perform simple production simulation
- give an account of the concepts lean production and TPS (Toyota Production System) and the most common lean tools.

The economy of the production system
- give an account of concepts such as fixed and variable cost and direct and indirect cost
- give an account of calculation models and perform investment and product calculation
- calculate capital binding and the value of work in progress (WIP)
- give an account of different key performance indicators and their calculation.

The quality and development of the production system
- outline the central concepts in Total Quality Management
- give an account of the basic aspects of process and quality management and quality planning
- give an account of the methods and tools for improvement and control
- apply the seven QC-tools (improvement tools)
- give an account of the concept of process capability and calculate process capability.

Content and Form of Instruction

The course is a basic course in the area of production. It links the following subareas into a system: Sustainability, organisation, layout and flow, production logistics, lean production, production preparation, production economy, quality assurance methods and tools. The aim of the course is that students acquire knowledge of the various components to get a holistic perspective on the processes of the production system.

The course starts with a unit on the role of industrial companies in society and how production is organised in an historical perspective. The influence of industry production on the environment is treated and environmental management systems such as ISO 14000 are treated. In the unit The control and organisation of the production system, the production processes and layout design are treated with a special emphasis on materials flows and the principle of flow.The logistics area includes stock inventory, batch sizing and materials planning. The basics of lean production are studied on the basis of Toyota's production system and so are the most common lean tools. In a production game (lean game) the theory earlier discussed is tested along with computer sessions in production simulation linked to different flow principles. The economy of the production system are treated in terms of models to describe the company in economic terms. In particular, product and investment calculation are dealt with. Capital binding is discussed in connection with layout, flow and planning principles. Improvement strategies such as TQM and Sex sigma are treated. Systematic management is a feature of quality assurance and quality planning. Special attention is paid to the 7 QC tools and process efficiency. Instruction is in the form of lectures and exercises.

Reading List

See separate document.

Examination

Assessment is based on written exams, mandatory laboratory sessions and hand-in assignments.

Grades

One of the grades Fail (U), 3 (Pass), 4 (Pass with Some Distinction) or 5 (Pass withDistinction) is awarded in the examination of the course.

Quality Assurance

Follow-up relating to learning conditions and goal-fulfilment takes place both during and upon completion of the course in order to ensure continuous improvement. Course assessment is based on student views and experiences as reported in written course evaluations and/or group discussions. Students will be informed of the result of the evaluation and of the measures to be taken.

Course Certificate

A course certificate will be provided upon request.

Additional Information

Students who enrolled before 1 July 2007 will complete their studies in accordance with the requirements of the earlier admission. Upon completion students may request degree and course certificates to be issued under the current ordinance if they meet its requirements.

The local regulations for studies at the Bachelor's and Master's levels at Karlstad University stipulate the obligations and rights of students and staff.

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