Syllabus for

Academic year 2011/2012 >

MTT030 - Manufacturing engineering

Syllabus adopted 2011-02-22 by Head of Programme (or corresponding)
Owner: TKDES
7,5 Credits
Grading: TH - Five, Four, Three, Not passed
Education cycle: First-cycle
Major subject: Mechanical Engineering, Industrial Design Engineering
Department: 43 - MATERIALS AND MANUFACTURING TECHNOLOGY

Teaching language: Swedish

Credit distribution

Course module	Sp1	Sp2	Sp3	Sp4	Summer course	No Sp	Examination dates
0106 Examination 7,5 c Grading: TH		7,5 c					Fri 16/12-2011 pm M, Fri 13/04-2012 am M, Thu 23/08-2012 am M

In programs
TKDES INDUSTRIAL DESIGN ENGINEERING, Year 3 (compulsory)
TKIEK INDUSTRIAL ENGINEERING AND MANAGEMENT - Production engineering, Year 3 (elective)

Examiner:
Professor Anders Kinnander

Eligibility:
For single subject courses within Chalmers programmes the same eligibility requirements apply, as to the programme(s) that the course is part of.

Aim
The aim of this course is to provide a comprehensive picture of the manufacturing of discrete products in todays industry with emphasis in short series production. A future Technical Design Engineer will have to have knowledge of the important connection between product design and manufacturing costs with regard to material, choice of process and geometry/shape. The course also means to provide knowledge of the most common and important manufacturing methods for metals and polymers.

Learning outcomes *(after completion of the course the student should be able to)*
- have basic knowledge in manufacturing processes in use today.
- select manufacturing process with respect to costs and quality aspects.
- perform calculations in order to design tools and choose feasible machine tools.
- use 3-axis CAM to prepare a part program for an NC-machine tool. The program is verified virtually.

Content
The course is introduced with a survey of the manufacuring department in todays industry. The role of the production engineering is enlightened and thereafter the different manufacturing methods, mostly for metal, are systematically classified and discussed with regard to energy consumption, production methodology, tools and machines, material properties and information transfer and also the results of manufacturing, tolerances and surface quality, that increases the product value. Special attention is directet towards "Concurrent Engineering", which defines methods and work flow for early production adaptation in the product life cycle; design for manufacturing and Assembly.

Topics
-Casting and design aspects
-Basic plasticity theory
-Metal forming: Rolling, extrusion, forging etc
-Powder Metallurgy
-Basic metal cutting theory
-Basic Joining methods; Welding, brazing and soldering
-Basic polymer manufacturing techniques e g injection moulding
-Process selection and early cost analysis

-Adaption to manufacturing: DFA, Design for Assembly and DFM, Design for Manufacturing
-Rapid Prototyping, for example SLS & SLA; lasersintering for test prototypes
-Introduction to Numerically Controlled Machines
-CAM - Computer Aided Manufacturing

Course Laboratory work: Experimental analysis, Exercises in CAM and laboratory work with Rapid prototyping and with NC Machine tool (turning centre).

Organisation

Examiner: Anders Kinnander 031- 772 58 28

Assistant Ulf Honsberg 031- 772 27 23

Secretary Margareta Machowska 031-772 12 65

Literature

Not decided.

Distributed material is to be found at the homepage.

Examination

Written exam.