



LUNDS UNIVERSITET
Lunds Tekniska Högskola

Course syllabus

Verkstadsteknik

Workshop Practice

MMTF15, 7,5 credits, G2 (First Cycle)

Valid for: 2023/24

Faculty: Faculty of Engineering, LTH

Decided by: PLED M

Date of Decision: 2023-04-11

General Information

Elective for: M4-prr, MD4, MPRR2

Language of instruction: The course will be given in English on demand

Aim

To provide the student with knowledge and skills to handle and operate various machines and manufacturing processes and to combine this with theoretical knowledge and work. After examination, the student should be able to practice their knowledge in other courses at Lund University.

Learning outcomes

Knowledge and understanding

For a passing grade the student must

Have knowledge and understanding of safety regulations for workshop practice.

Understand and be able to interpret information on a machine drawing in order to carry out a complete process planning of a drawn part.

Be able to assess and describe factors important for product quality and productivity, related to the actual processes in the course.

Be able to create a NC program for a numerical lathe and for a numerical milling machine, on basis of a technical drawing and to be able to simulate the NC code and to perform error correction.

Be able to explain the effects of different heat treatment operations and based on prepared material samples and material models, in group and in writing and orally, be able to analyse the results of the practical exercises.

Competences and skills

For a passing grade the student must

Be able to safely operate machining equipment, including choosing the correct cutting data and to rig the right tool setups.

Be able to operate different welding machines and processes, including different welding positions.

Be able to program a numerical machine and to perform a simulation and error correction at the machine panel.

Be able to perform heat treatment of materials and to be able to evaluate the effect of the heat treatment based on sample testing and analysis.

Contents

The course comprises a number of practical tasks where different types of machines and workshop processes are introduced, followed by individual exercises in order to promote the practical skills of the student. Related to each practical task, theoretical aspects are illustrated and examined, e.g. in the applied materials section. The main part of the course is carried out in the student workshop facility and the machine equipment installed constitutes the focus of the course tasks. Being examined from the course, each student will receive a workshop license which allows for utilizing the workshop in other LTH courses and in the thesis work. The course comprises education in machining of materials (turning, milling, drilling etc), sheet metal processing, welding (MAG, TIG, MMA), NC machining, tool technology and a comprehensive part including materials technology and heat treatment. The heat treatment part comprises material structures in different material groups, the heat treatments to achieve certain properties and sample preparation in order to analyse structures and properties. Theoretical models are used in order to understand achieved results.

Examination details

Grading scale: UG - (U,G) - (Fail, Pass)

Assessment: Practical exercises and tests for every characteristic machine or group of machine, in the form of a real part to be manufactured after machine drawings, alternatively practical exercises related to processes demanding training of personal skills, e.g. welding. Individual written reports, complementary to the practical exercises, where different aspects of process planning and process outcome should be analysed. In groups, written reports on heat treatment and applied materials technology, together with oral presentation.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Admission

Assumed prior knowledge: MMT012/MMTF20 Production and Manufacturing Methods, FKM015/FKMA01 Materials technology

The number of participants is limited to: 20

Selection: Completed university credits within the programme. Priority is given to students enrolled on programmes that include the course in their curriculum.

Reading list

- B. Zakharov: Heat Treatment of Metals. University Press of the Pacific, ISBN: 10: 1410203050.
- Written material compiled at the department.

Contact and other information

Course coordinator: Mats Andersson, mats.andersson@iprod.lth.se

Further information: The number of available positions in the course is limited to 20 persons. A selection process will take part ca one month before the course starts. Confirmation will be sent out via the email address used by each in the application portal. A confirmation from each student is needed in order to be accepted. Compulsory attendance at the first lecture.