

Tárgytematika / Course Description Theory and practice of metal forming

AJNM_ATT013

Tárgyfelelős neve /

Teacher's name: dr. Tancsics Ferenc

Félév / Semester: 2025/26/2

Beszámolási forma /

Assesment: Vizsga

Tárgy heti óraszám /

Teaching hours(week): 2/1/0

Tárgy féléves óraszám /

Teaching hours(sem.):

OKTATÁS CÉLJA / AIM OF THE COURSE

Summary of the requirements and instructions required to complete the *Theory and practice of plastic forming* course.

TANTÁRGY TARTALMA / DESCRIPTION

Curriculum:

WEEK 1

Description of the requirements, presentation of the subject.

Module 1 / Lesson 1:

Basic concepts, Metal crystal structures, Microstructural plasticity, Dislocation mechanism, Effects hindering dislocation movement, Macro-structural plasticity.

WEEK 2

Module 2 / Lesson 2:

Geometric equations, Strain state theory, Stress state theory, Material-equations, Plasticity conditions, Deformation work.

WEEK 3

Module 3 / Lesson 3:

Heating characteristics of steels, Boundary layer friction, Boundary layer lubrication, Tool wear characteristics, Effect of cold forming, Screw production, Cold forming, Temperatures of cold and hot forming

WEEK 4

Module 4 / Lesson 4:

[Open die forging](#), Basic operations, Assistant operations, Weight of forging piece, Forging machines for open die forging, [Closed / Impression die forging](#), Forging machines for closed die forging, Applications and methods, Closed / Impression die forging technology, Forging tool design viewpoints

WEEK 5

Module 4 / Lesson 5:

[Rolling](#), Rolling mill, Basics of rolling technology, Typical rolling processes, [Extrusion](#), Extrusion equipment, Extrusion dies, Basics of extrusion technology, Optimization of extrusion parameters

WEEK 6

Module 4 / Lesson 6:

[Pipe manufacturing](#), Seamless pipes manufacturing, Cross-roll piercing processes, Elongation rolling processes, Operations of pipe rolling finishing, Elongation by cold Pilger, Comparison of pipe production methods, [Metal drawing](#), Bar, tube and wire draw machines, Metal draw dies, Basics of metal drawing technology

WEEK 7

Issuance of task: completing of a forging drawing of a crown wheel using an arbitrary CAD system

WEEK 14

Submission of task: completed forging drawing in PDF format

SZÁMONKÉRÉSI ÉS ÉRTÉKELÉSI RENDSZERE / ASSESSMENT'S METHOD

Condition to fulfil signature

The student can get a signature if he/she submits his assignment qualifying their semester's work in an appropriate form and with an elaborate content by the end of the course (week 14).

category

appropriate form and content: 10 points

Condition to fulfil exam grade

The student can apply for the exam if he/she has a signature for the semester. The exam has to be taken in writing, by writing an exam test based on the curriculum of the semester. Exam dates and venues are announced in the NEPTUN system.

Grades that can be obtained based on the evaluation of the exam test: 60%-69% 2

70%-79% 3

80%-89% 4

90%-100% 5

Condition to fulfil an offered exam grade:

An offered exam grade can be obtained as a result of outstanding mid-year work by fulfilling one of the conditions below.

Student can receive an offered exam grade if he/she fulfils the requirements for obtaining a signature and submits his/her assignment with excellent or good evaluation.

categories

good: above 15 points (signature 10 points + task 5 points)

excellent: above 20 points (signature 10 points + task 10 points)

Student can receive an offered exam grade if he/she fulfils the requirements for obtaining a signature and completes the optional tasks available at the end of the lectures, submits them for evaluation, and the cumulated evaluation ends with a good or excellent result.

Categories:

good: above 15 points (signature 10 points + optional tasks 5 points)

excellent: above 20 points (signature 10 points + optional tasks 10 points)

Laboratory practice

Laboratory practice occasions following the lectures are used for consultation and solving practical tasks.

Communication

Exchange of messages and electronic consultations take place via NEPTUN's mail system or the provided e-mail address. E-mail address: tancsics@sze.hu.

Intellectual Property Management

The written works, data collection and presentations, drawing documentation and models created by the students are the intellectual property of AHJK-ATT and may be freely used for educational purposes in the future.

Plagiarism: a student commits plagiarism who partially or fully presents another's intellectual creation as his/her own. Plagiarism - especially in the case of written assignments - conflicts with the regulations of

KÖTELEZŐ IRODALOM / OBLIGATORY MATERIAL

Required and recommended literature

Educational aid available at: szelearning.sze.hu. To complete the course, it is sufficient to acquire the content of the lessons. This is the .

AJÁNLOTT IRODALOM / RECOMMENDED MATERIAL