COURSE DESCRIPTION CARD - SYLLABUS

Course name
Heat treatment [S1ETI2>OC]

Course

Field of study
Education in Technology and Informatics

Year/Semester
2/3

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
elective

Number of hours

Lecture
15

Laboratory classes
15

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

2,00

Coordinators

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Lecturers

Prerequisites

Basic knowledge of materials science and metal science.

Course objective

Students become familiar with theoretical and practical issues related to heat treatment and thermo - chemical treatment.

Course-related learning outcomes

Knowledge:
The student knows the basic terminology of heat treatment.
The student is able to characterize basic heat treatment processes.
The student has knowledge of basic heat treatment processes applied to ferrous alloys and non-ferrous alloys.

Skills:
The student is able to apply basic heat treatment procedures to specific groups of materials.
The student is able to select the technology of heat treatment with equipment for production

processes.
The student is able to distinguish typical disadvantages of heat treatment processes.
The student has the basic practical skills for the work related to the implementation of heat treatment processes.

Social competences:
The student can independently expand knowledge and skills in heat treatment.
The student is able to communicate with employees of the production department in the field of heat treatment.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: Written test at the end of the semester consisting of: open questions and/or test questions. Grading scale: <51% 2.0; 51% -64% 3.0; 65% -74% 3.5; 75% -84% 4.0; 85% -94% 4.5; > 95% 5.0
Laboratory: pass on the basis of an oral and/or written test and/or on an e-learning platform in the field of the content of each laboratory exercise, report of each laboratory exercise as instructed by laboratory instructors. In order to pass the exercises, all of oral or/and written tests and all reports must be counted as positive.

Programme content

Basic terminology and definitions applicable to heat treatment.
Technological processes of heat treatment.
Technological processes of thermo-chemical treatment.

Course topics

Lecture:
1. Basic terminology and definitions applicable to heat treatment.
2. Classification of heat treatment processes.
3. Annealing processes applied to ferrous alloys.
4. Hardening.
5. Hardenability of steel and its importance in heat treatment. Methods of evaluating the hardenability of steel.
6. Tempering.
7. Heat treatment of non-ferrous alloys.
8. Technological processes of thermo-chemical processing.

Laboratory:
1. Introduction to basic terminology used in heat treatment.
2. Basic heat treatment processes applied to ferrous alloys.
3. Hardenability of steel and methods of determining it.
4. Heat treatment of non-ferrous alloys.
5. Thermo-chemical treatment.

Teaching methods

Lecture: multimedia presentation.
Laboratory: practical exercises, discussion, problem solving.

Bibliography

Basic:
1. Burakowski T., Wierzchoń T., Inżynieria powierzchni metali, WNT, Warszawa 1995.
2. Skrzypek S.J., Przybyłowicz K., Inżynieria metali i technologie materiałowe, PWN, 2019.
3. Assonow A. D., Obróbka cieplna części maszyn, WNT, 1972.
4. Luty, W., Poradnik inżyniera : obróbka cieplna stopów żelaza WNT, 1977.

Additional:
1. Kula P., Inżynieria warstwy wierzchniej, Wyd. Poltechniki Łódzkiej, 2000.
2. Moszczyński A., Sobusiak T., Atmosfery ochronne do obróbki cieplnej, WNT, W-wa 1971

Breakdown of average student's workload

	Hours	ECTS
Total workload	55	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	25	1,00