



SVEUČILIŠTE U ZAGREBU
METALURŠKI FAKULTET

UNIVERSITY OF ZAGREB
FACULTY OF METALLURGY

UNDERGRADUATE UNIVERSITY
VOCATIONAL PART-TIME
STUDY PROGRAMME IN
FOUNDING



SVEUČILIŠTE U ZAGREBU
METALURŠKI FAKULTET

UNIVERSITY OF ZAGREB
FACULTY OF METALLURGY

Designation	LEARNING OUTCOMES AT THE PROGRAM LEVEL
IU1	Explain and understand the casting process and solidification of metal castings in expendable and permanent moulds.
IU2	Relate microstructure and properties of castings.
IU3	Relate the chemical composition, metallurgical quality of melt and conditions during solidification with the obtained microstructure and properties of castings.
IU4	Distinguish microstructural constituents in ferrous and non-ferrous alloys.
IU5	Use phase diagrams.
IU6	Explain the mechanism of eutectic, peritectic and eutectoid reaction.
IU7	Explain phase transformation in ferrous and non-ferrous casting alloys.
IU8	Describe ferrous and non-ferrous casting alloys according to their properties.
IU9	Relate the properties of casting alloys with their structures.
IU10	Select adequate casting alloy depending on the conditions of the castings application.
IU11	Define the elements of the elaboration of the technological process of expendable and permanent moulds making.
IU12	Construct and calculate the horizontal and vertical gating system for the casting of ferrous and non-ferrous alloys.
IU13	Construct and calculate feeding system for ferrous and non-ferrous casting alloys.
IU14	Select the appropriate process and technology for expendable core and mold making depending on the casting requirements that are being produced.
IU15	Explain heat transfer during melting and heating in foundry aggregates.
IU16	Explain the principle of operation of cupola, induction, electric arc and reverberatory furnace.
IU17	Analyse melting aggregate performance and optimize the melting process.
IU18	Select charge materials for melting aggregate according to the type of casting alloy that would be produced and the prescribed properties of castings.
IU19	Define the melting technology in cupola, induction, electric arc and reverberatory furnaces.
IU20	Distinguish types of refractory materials.
IU21	Use refractory materials depending on their properties.
IU22	Examine the chemical composition and metallurgical quality of the melt.
IU23	Determine the melt processing conditions based on the analysis of chemical composition and metallurgical quality of the melt.
IU24	Select the appropriate inoculant and treatment alloy.
IU25	Apply thermal analysis in melt quality control system.

IU26	Define the parameters of the technology of high-pressure die casting and gravity casting of aluminium alloys.
IU27	Explain the process of direct chill and continuous casting of aluminium alloys.
IU28	Explain semisolid casting processes.
IU29	Recognize type of casting defect.
IU30	Explain the mechanism of defect formation on the casting and propose methods to avoid the formation of defects on the castings.
IU31	Analyse the results of the examination of the mechanical properties of metallic materials.
IU32	Analyse the results of non-destructive methods of testing metallic materials.
IU33	Prepare samples for metallographic analysis.
IU34	Use equipment for metallographic analysis and interpret the results of analysis.
IU35	Determine the temperature and oxygen activity in the melt.
IU36	Determine the chemical composition of casting alloys by analytical techniques.
IU37	Define the parameters of heat treatment of ferrous and aluminium casting alloys.
IU38	Select the appropriate method of protecting castings from corrosion.
IU39	Select the appropriate coating process or modification of the casting surface depending on the conditions of use of the casting.
IU40	Describe the modern concepts of production of castings.
IU41	Apply software for optimization of casting construction.
IU42	Apply casting processes simulation software and interpret results.
IU43	Compare the success of mathematical models of solidification of castings with concrete results from practice.
IU44	Apply basic quality assurance tools.
IU45	Recognize sources of environmental contamination in the foundry.
IU46	Recognize environmentally harmful substances in foundries.
IU47	Describe the procedures for disposal of hazardous and non-hazardous foundry waste.
IU48	Developing the ability to perform logical conclusion and precision in research.
IU49	Recognize the possibilities of recovery of certain types of foundry waste.
IU50	Select the appropriate procedure and parameters of repair welding depending on the type of defect and type of material to be welded.
IU51	Analyse the chemical reactions that take place during melting and casting.
IU52	Explain the properties of chemical elements based on their position in the periodic system.
IU53	Make a technical drawing of casting.
IU54	Explain the working principle and function of the basic elements of machines in the foundry.
IU55	Analyse company business results.
IU56	Knowledge of the physical basis of phenomena in nature and ability to identify physical quantities involved in the process under consideration.
IU57	Knowledge of general and professional English.

