17. Casting

GENERAL INFORMATION ABOUT THE COURSE		
Course coordinator	Daniel Novoselović, PhD, associate professor	
Course name	**Casting**	
Study program	**Mechanical Engineering**	
Course status	Compulsory / Elective	
Year	1	
Semester	1	
Number of credits and teaching methods	ECTS student load coefficient	5
	Number of hours (lectures + seminars + exercises)	30+15+15

1. DESCRIPTION OF COURSE
1.1. Course objectives
Becoming familiar with casting technologies and casting in general as a branch of industry.
1.2. *Course enrolment prerequisites (if applicable)*
None.
1.3. Expected course learning outcomes
After successfully completing the course, the student will be able to: 1. Describe the technological process in a foundry 2. Explain the preparation and transport of mould mixtures 3. Compare different types of moulds 4. Compare different types of mould lines 5. Identify mistakes occurring on casts 6. Perform gating system calculations

1.4. Course content
2.4.1. Familiarising students with casting technologies and casting as a branch of industry. 2.4.2. Schematic diagram of the technological process in a foundry. 2.4.3. Storing and transporting moulding sand. Sand storage tanks. 2.4.4. Preparing mould mixtures, types of mixers for preparing mould and core mixtures. 2.4.5. Transporting and storing mould mixtures. 2.4.6. Cooling and regeneration of mould mixtures.

2.4.7. Fundamental principles of moulding and different types moulding machines.
2.4.8. Overview of mould lines for production of single-use moulds.
2.4.9. Mechanised and automated mould lines. Moulding machine.
2.4.10. Overview of melting furnaces.
2.4.11. Transporting and pouring molten metals into moulds.
2.4.12. Overview of machines (casting machine) for pouring molten metals into moulds.
2.4.13. Cooling and cleaning a cast, machines for cleaning casts.
2.4.14. Quality control of casts
2.4.15. Detection and analysing defects on casts.

a. Types of teaching	☒ Lectures ☒ Seminars and workshops ☒ Exercises ☒ Distance learning ☐ Fieldwork	☒ Individual assignments ☒ Multimedia and network ☐ Laboratory ☒ Mentorship ☐ Other types
1.7. Comments		

1.8. Student obligations (attendance at classes, lectures, tutorials, seminars)

- Active participation and attendance at lectures and exercises.
- Active participation in online activities via Loomen.
- Researching scientific and professional literature (books, thematic articles, etc.)
- Preparing and presenting a seminar paper.
- Edit, supplement and correct the seminar paper according to reviews.

1.9. Tracking student work (proportion of individual activities in terms of ECTS credits based on the total number of ECTS credits)

Class attendance	2.0	Class participation		Seminar paper	0.5	Experimental work	
Written exam	1.5	Oral exam		Essay		Research	
Project		Continual assessment of knowledge		Written seminar paper		Practical work	
Online activity							

1.10. Grading and assessment of student work during the semester and for the final exam *(interim exam, written exam, oral exam)*

Each student activity is assessed with a certain number of scores:

1. Attendance at lectures and exercises: 0-5 points
2. Submission and oral defence of seminar paper: 0-10 points
3. Written exam: 40-70 points
4. Oral exam: 10-15 points

Successful completion of the course requires a minimum score of 60/100 points.

1.11. **Mandatory literature** (relevant at the time of submitting the proposed study program)

- Ivan Budić: Osnove tehnologije kalupljenja, Jednokratni kalupi I dio, II izmijenjeno i dopunjeno izdanje, Strojarski fakultet, Slavonski Brod, 2010.

- Ivan Budić, Zoran Bonačić-Mandinić: Osnove tehnologije kalupljenja, Jednokratni kalupi II dio, Strojarski fakultet, Slavonski Brod, 2004.
- Ivan Budić: Posebni ljevački postupci, I dio, Strojarski fakultet, Slavonski Brod, 2006.
- Ivan Budić: Posebni ljevački postupci, II dio, Strojarski fakultet, Slavonski Brod, 2009.

1.12. Supplementary literature (relevant at the time of submitting the proposed study program)

- Ljevački priručnik, Savez ljevača Hrvatske, Zagreb, 1985.
- Tehnička enciklopedija, Mehanizacija ljevaonica, LZMH, Zagreb, 1986.

1.13. Manner of tracking quality to ensure the acquisition of exit knowledge, skills and competences

2. COMBINING THE LEARNING OUTCOMES, TEACHING METHODS AND ASSESSMENT OF THE LEARNING OUTCOMES

2.1. Class participation	*2.2. Student participation*	*2.3. Learning outcome*	*2.4. Assessment method*
Class attendance	Actively following lectures, participating in discussions, presenting one’s own opinion	1-6	Record
Seminar paper	Preparing a seminar paper during the exercises and autonomously	6	Submission and oral defence of seminar paper
Written evaluation of knowledge	Preparation for the oral exam	1-6	Written exam
Final exam	Reviewing the course content	1-6	Oral exam

Lectures – Week 1

Name of course unit:	Introduction
Learning outcome covered in the course unit	

1	
Description of topic treated in the course unit: • Familiarising students with casting technologies • Casting as a branch of industry	
Note *(if applicable)*	