

COURSE GUIDE – short form

Academic year 2017/2018

Course name ¹	Ferrous alloys					Course code		3SM07	
Course type ²	DS	Category ³	DI	Year of study	III	Semester	II	Number of credit points	6

Faculty	Materials Science and Engineering				Number of teaching and learning hours ⁴					
Field	Materials Engineering				Total	L	T	LB	P	IS
Specialization	Materials Engineering				84	42	-	14	28	-

Pre-requisites from the curriculum ⁵	Compulsory	Not applicable
	Recommended	Not applicable

General objective ⁶	Characterization of ferrous alloys, obtained by manufacture, as metallographic structure and properties and influence of the manufacture on features of these ones for performances obtaining
Specific objectives ⁷	Primary and secondary structures analysis for irons and steels, main metallurgical factors that influence irons and steel features (cooling rate, chemical composition, impurities, deoxidation, boiling, melting rate, superheating degree in liquid state, inoculation, grafitization treatment, alloying, vacuum treatment, using of plasma devices, gases, vibration, heredity etc, for ferrous alloys improvement.

Course description ⁸	<ol style="list-style-type: none"> 1. Iron and steel history 2. Features of irons structure formation <ol style="list-style-type: none"> 2.1. Iron definition. Iron classification. 2.2. Primary structure of unalloyed iron. 2.3. Secondary structure of unalloyed iron. 3. Influence of the certain manufacture conditions on iron features <ol style="list-style-type: none"> 3.1. Chemical composition 3.2. Impurities 3.3. Gases 3.4. Non-metallic inclusions 3.5. Metallurgical heredity 3.6. Superheating and maintaining in liquid state 3.7. Inoculation 3.8. Cooling rate 3.9. Treatment by vibrations 3.10. Anomalies of structures 4. Iron characterization and manufacture influence on these ones <ol style="list-style-type: none"> 4.1. Gray cast iron 4.2. Compacted graphite cast iron 4.3. Coral like graphite cast iron; 4.4. Cast iron whose metallic matrix is austenite 4.5. Malleable cast iron 4.6. White cast iron 4.7. Alloyed cast iron 5. Manufacture features in different furnace and interference with obtained iron features <ol style="list-style-type: none"> 5.1. Cupola 5.2. Induction furnace 5.3. Electric arc furnace 6. Features of steel structure formation <ol style="list-style-type: none"> 6.1. Steel definition. Steel classification 6.2. Primary structure of unalloyed steels 6.3. Secondary structure of unalloyed atees 7. Steels characterization <ol style="list-style-type: none"> 7.1. Unalloyed steels 7.2. Alloyed steels <p>There are 7 laboratory works – the last one is for finale evaluation and retrieving. There are 14 stages for project works.</p>
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Assessment		Schedule ⁹	Percentage of the final grade (minimum grade) ¹⁰
Continuous assessment	Class tests along the semester	W5, 10 and 14	At least 5 mark, each, 10 %
	Activity during laboratory works	w1-w14	20% (at least 5 mark)
	Activity during project works	w1-w14	20% (at least 5 mark)
	Homework	W. 12	10% (at least 5 mark)
Final assessment	Final assessment form ¹¹	Exam	Ses.
	Examination procedures and conditions: Oral exam, exam tickets. A ticket contains three exam subjects - two treating iron and one, steel. The mark obtained for the subject that deals with steel shall be at least 5 and mark obtained for one of the subjects that treats iron misalignment must be at least 5. Examination takes place if the lab, home work and each of the three tests have a promotion mark of at least 5, only.		40% (at least 5 mark)

Course organizer	Vasile Cojocaru Filipiuc, dr., eng., prof.	
Teaching assistants	Vasile Cojocaru Filipiuc, dr., eng., prof.	

¹Course name from the curriculum

² DF – fundamental, DID – in the field, DS – specialty, DC – complementary (from the curriculum)

³ DI – imposed, DO –optional, DL – facultative (from the curriculum)

⁴ Points 3.8, 3.5, 3.6a,b,c, 3.7 from the Course guide – extended form (L-lecture, T-tutorial, LB-laboratory works, P-project, IS-individual study)

⁵ According to 4.1 – Pre-requisites - from the Course guide – extended form

⁶ According to 7.1 from the Course guide – extended form

⁷ According to 7.2 from the Course guide – extended form

⁸ Short description of the course, according to point 8 from the Course guide – extended form

⁹ For continuous assessment: weeks 1 – 14, for final assessment – colloquium: week 14, for final assessment-exam: exam period

¹⁰ A minimum grade might be imposed for some assessment stages

¹¹ Exam or colloquium

20.09.2017