

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Metallurgy and Foundry		Code 1010604221010240012
Field of study Mechanical Engineering	Profile of study (general academic, practical) general academic	Year /Semester 1 / 2
Elective path/specialty -	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) part-time	
No. of hours Lecture: 18 Classes: 18 Laboratory: - Project/seminars: -		No. of credits 4
Status of the course in the study program (Basic, major, other) major		(university-wide, from another field) university-wide
Education areas and fields of science and art technical sciences		ECTS distribution (number and %) 4 100%
Responsible for subject / lecturer: PhD. Eng. Jakub Hajkowski email: jakub.hajkowski@put.poznan.pl tel. 61-665-2771 Faculty of Mechanical Engineering and Management 3 Piotrowo street, 60-965 Poznan		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Basic in the field of chemistry and physics of solid, liquid and gas state, metallurgy and foundry and metallurgy.
2	Skills	Logical thinking. Use of information sources (library, Internet).
3	Social competencies	Understanding the need to learn and acquire new knowledge.
Assumptions and objectives of the course: Understanding the methods of classical casting technology and the basics of the simulation process of casting technology.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Has basic, ordered knowledge about metal materials used in the construction of machines, such as iron, aluminum, copper etc. used in machine construction, in particular about their structure, properties, manufacturing methods, heat and thermochemical treatment and the impact of plastic forming on their strength - [M1_W09]		
2. as basic knowledge of manufacturing techniques used in the machine industry, such as casting, plastic working, loss and incremental machining, welding and other techniques of joining materials, cutting, coating and surface treatments - [M1_W14]		
Skills:		
1. Is able to search in catalogs and on manufacturers' websites ready machine components for use in own projects - [M1_U02]		
2. ble to draw a schematic and a simple machine element in accordance with the principles of technical drawing - [M1_U22]		
Social competencies:		
1. Is ready to critically evaluate own knowledge and content - [M1_K01]		
Assessment methods of study outcomes		
Current control and final test of knowledge. Written exam.		
Course description		

<p>Lecture:</p> <ol style="list-style-type: none"> 1. Main and auxiliary molding materials. 2. Test methods for molding sand properties. 3. Methods of making castings in sand and permanent molds. 4. Introduction to the design of castings. 5. Technological properties of selected foundry alloys. 6. Crystal structure of casting alloys. 7. Methods of destructive and non-destructive testing of castings. 8. Methods of controlling the properties of castings. <p>Classes:</p> <ol style="list-style-type: none"> 1. Test on selected properties of molding / core sand. 2. Manufacturing of castings using the manual forming method. 3. Design of cast products. Basics. 4. Die casting. 5. Production of shell sand molds. 6. Investment casting technology. The method of wax models. 7. Computer simulation of selected foundry processes. 8. Identification and evaluation of casting characteristics obtained with different methods. 		
<p>Basic bibliography:</p> <ol style="list-style-type: none"> 1. Campbell J., Complete Casting Handbook, Metal Casting Processes, Metallurgy, Techniques and Design, 2nd Edition, Butterworth-Heinemann, 2015. 2. Praca zbiorowa red. J.Sobczak, Poradnik Odlewnika. Odlewnictwo współczesne. Tom I Materiały, Wyd. STOP, 2013 3. Braszczyński J., Teoria procesów odlewniczych, PWN Warszawa 1989 4. Górny Z., Odlewnicze stopy metali nieżelaznych, Przygotowanie ciekłego metalu, struktura i właściwości, WNT Warszawa 1992 5. Ignaszak Z., Bazy danych i walidacja, Wyd. Politechniki Poznańskiej, Poznań 2002 6. Ashby M. i in., Materiały inżynierskie tom I i II, WNT, 1996 		
<p>Additional bibliography:</p> <ol style="list-style-type: none"> 1. Praca zbiorowa red. J.Sobczak, Poradnik Odlewnika. Odlewnictwo współczesne. Tom I Materiały, Wyd. STOP, 2013 2. Braszczyński J., Teoria procesów odlewniczych, PWN Warszawa 1989 3. Górny Z., Odlewnicze stopy metali nieżelaznych, Przygotowanie ciekłego metalu, struktura i właściwości, WNT Warszawa 1992 4. Ignaszak Z., Bazy danych i walidacja, Wyd. Politechniki Poznańskiej, Poznań 2002 		
<p>Result of average student's workload</p>		
<p>Activity</p>		<p>Time (working hours)</p>
1. lecture		18
2. exercises		18
3. consultation		15
4. pass		5
5. student		20
<p>Student's workload</p>		
<p>Source of workload</p>	<p>hours</p>	<p>ECTS</p>
Total workload	76	4
Contact hours	27	2
Practical activities	12	2