

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Material Binding		Code 1010601141010230428
Field of study Mechanical Engineering	Profile of study (general academic, practical) (brak)	Year /Semester 2 / 4
Elective path/specialty -	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 1 Classes: 1 Laboratory: - Project/seminars: -		No. of credits 2
Status of the course in the study program (Basic, major, other) (brak)		(university-wide, from another field) (brak)
Education areas and fields of science and art technical sciences		ECTS distribution (number and %) 2 100%
Responsible for subject / lecturer: Artur Wypych email: artur.wypych@put.poznan.pl tel. 616653598 WBMiZ ul. Piotrowo 3		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Basic knowledge from technical physics, chemistry and materials sciences
2	Skills	logically thinking, using an internet and library materials to wide the rage of knowledge
3	Social competencies	understand the learn necessity and new knowledge achieve
Assumptions and objectives of the course: - methods of bonding materials by welding, - basic heat source welding presentation, - metallurgical knowledge in homonominal and heteronominal materials bonding - bonding by welding processes application		
Study outcomes and reference to the educational results for a field of study		
Knowledge: 1. characterization of different heat sources of welding and kinds of addition materials with base materials bonding - [T1A_W01 T1A_W02 T1A_W03 T1A_W04] 2. variation of welding processes selection - [T1A_W03 T1A_W04 T1A_W05] 3. fusion welds construction definition - [T1A_W03 T1A_W04 T1A_W05]		
Skills: 1. knowledge and understand of meaning the basic welding machinery elements - [T1A_U01 T1A_U03 T1A_U04 T1A_U07 T1A_U15] 2. initial conditions choice of welding processes - [T1A_U09 T1A_U11] 3. planning for welding processes and simulation - [T1A_U09 T1A_U01 T1A_U11]		
Social competencies: 1. group cooperation technique - [T1A_K01 T1A_K03 T1A_K04] 2. consciousness of welding processes for modern management and for society - [T1A_K04 T1A_K05]		
Assessment methods of study outcomes		

<p>Lecture: final written examination consist of 5 overall question (minimum correct answers for 3 questions: <3 ? ndst, 3 ? dst, 3,5 ? dst+, 4 ? db, 4,5 ? db+, 5 ? bdb) realize on the end of semester</p> <p>Exercise: written examination consist of 3 problems, acceptable of own calculators and notes</p>		
Course description		
<p>Lecture: construction of welding machinery, external characteristics of source current of welding, characterization of bonding methods (welding: gas, MMA, TIG, GMA, SAW, PAW and spot, seam, flash, upset and friction welding), thermal spraying (flame, arc, plasma), bonding of heteronominal materials, characterization and classification of additional welding materials</p> <p>Exercise: counting calculation in the aspect of welding gases using, heat balance, heat input, HAZ range, current and speed of welding as a function a variation of welding process, balance of forces on the drop in arc, welds geometry, basics in calculation on construction welds</p>		
<p>Basic bibliography:</p> <ol style="list-style-type: none"> 1. Spawanie zgrzewanie i cięcie metali, Klimpel A., WNT, Warszawa, 1999 2. Spawalnictwo, Ferenc K., WNT, Warszawa, 2007 		
<p>Additional bibliography:</p> <ol style="list-style-type: none"> 1. Poradnik Inżyniera Spawalnictwo cz.1, Pilarczyk J., WNT, Warszawa, 2001 		
Result of average student's workload		
Activity	Time (working hours)	
1. get ready to pass an lecture examination	3	
2. pass an examination	2	
3. get ready to pass an exercise examination	1	
4. pass an exercise examination	2	
Student's workload		
Source of workload	hours	ECTS
Total workload	30	2
Contact hours	30	2
Practical activities	0	0