

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Plastic Forming</b>		Code <b>1010604131010200185</b>
Field of study <b>Mechanical Engineering</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>2 / 3</b>
Elective path/specialty <b>-</b>	Subject offered in: <b>Polish</b>	Course (compulsory, elective) <b>obligatory</b>
Cycle of study: <b>First-cycle studies</b>	Form of study (full-time, part-time) <b>part-time</b>	
No. of hours Lecture: <b>10</b> Classes: <b>8</b> Laboratory: <b>-</b> Project/seminars: <b>-</b>		No. of credits <b>2</b>
Status of the course in the study program (Basic, major, other) <b>(brak)</b>		(university-wide, from another field) <b>(brak)</b>
Education areas and fields of science and art <b>technical sciences</b>		ECTS distribution (number and %) <b>2 100%</b>
<b>Responsible for subject / lecturer:</b>  dr inż. Waldemar Matysiak email: waldemar.matysiak@put.poznan.pl tel. +4861 665-2681 Budowy Maszyn i Zarządzania ul. Piotrowo 3, 60-965 Poznań		
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	Basic knowledge of mathematics, physics
2	<b>Skills</b>	Logical reasoning skills and knowledge acquired during mating education according to the curriculum, the ability to review and selection of literature.
3	<b>Social competencies</b>	Understanding and perception of the Reed for learning and acquiring New knowledge and its continuous deepening.
<b>Assumptions and objectives of the course:</b> Knowledge of metalworking methods as applied to the manufacture of parts and exploitation of machines and the introduction of machinery and tooling for metal forming.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. Has a basic knowledge of manufacturing techniques used in engineering, such as cutting materials, forging, stamping, bending - [K1A_W15]		
2. Has a basic knowledge of metal forming methods as applied to the manufacture of parts and exploitation of machines - [K1A_W09]		
3. Has a basic knowledge of the operation of machines for metal forming. - [K1A_W09]		
<b>Skills:</b>		
1. Is able to how to identify technical problems in the field of plastic forming processes, the exploitation of machinery and tooling - [K1A_U24]		
2. Has the ability perform elementary calculations forming processes - [K1A_U17]		
3. Has ability how to choose appropriate technologies to shape metal plastic products with the required properties - [K1A_U18]		
4. Has ability how to choose machines for metal plastic working, depending on the required assumptions - [K1A_U25]		
5. Has ability how design the technology of simple machine component - [K1A_U18]		
<b>Social competencies:</b>		
1. Understands the need and knows the possibilities of continuous training - [K1A_K01]		
2. Can provide information about metal forming in a commonly understood - [K1A_K02]		
3. Knows how to interact and work in a group taking on different roles - [K1A_K03]		

<b>Assessment methods of study outcomes</b>		
<p><b>Lectures:</b>                      Written examination conducted at the end of semester (credit in the case of a minimum 50.1% of correct answers). &lt;50.1% - 2.0; 50.1%+60% - 3.0; 60.1%+70% - 3+; 70.1%+80% - 4.0; 80.1%+90% - 4+; &gt;90.1% - 5.0.</p> <p><b>Classes:</b>                      Credit on the basis of the written reply from the scope of the content of the material covered during the classes (credit in the case of a minimum 50.1% of correct answers). &lt;50.1% - 2.0; 50.1%+60% - 3.0; 60.1%+70% - 3+; 70.1%+80% - 4.0; 80.1%+90% - 4+; &gt;90.1% - 5.0.</p>		
<b>Course description</b>		
<p><b>Lectures:</b></p> <ol style="list-style-type: none"> <li>1. Basic theoretical knowledge of plastic forming of metals and their alloys (plasticity conditions, the mechanism of plastic deformation).</li> <li>2. technological operations forming of sheet metal products (cutting, bending, stamping) or rods (forging, rolling, extrusion, wire drawing).</li> <li>3. Materials prone to forming.</li> <li>4. Change the properties of materials during the forming of plastic products processing methods.</li> <li>5. General information about the materials, tools and lubricants technology.</li> <li>6. Defects in products and possibilities to prevent their occurrence.</li> <li>7. Examples of technological Processes.</li> </ol> <p><b>Classes:</b></p> <ol style="list-style-type: none"> <li>1. Calculation the strain components and replacement, plasticity conditions.</li> <li>2. Calculation of sheet metal cutting process using guillotine shears.</li> <li>3. Calculation of sheet metal cutting process using press and cutting devices.</li> <li>4. Calculation of technological process of cylindrical die stamping processes of single intervention.</li> <li>5. Calculation of technological process of cylindrical die stamping processes of multi intervention.</li> <li>6. Calculation of a rectangular die stamping process.</li> <li>7. Calculation of the volume forming processes (forging, extrusion, rolling).</li> </ol>		
<p><b>Basic bibliography:</b></p> <ol style="list-style-type: none"> <li>1. Erbel S., Kuczyński K., Marciniak Z.:Obróbka plastyczna. Warszawa: PWN 1986</li> <li>2. Morawiecki M., Sadok L., Wosiek E.: Teoretyczne podstawy technologicznych procesów przeróbki plastycznej, Wyd. Śląsk, 1986</li> <li>3. Marciniak Z.: KONSTRUKCJA TŁOCZNIKÓW, Ośrodek Techniczny A. Marciniak, Warszawa, 2002</li> </ol>		
<p><b>Additional bibliography:</b></p> <ol style="list-style-type: none"> <li>1. Erbel S.,Golatowski T.,Kuczyński K., Marciniak Z. i inni: Technologia obróbki plastycznej na zimno. Warszawa: SIMP-ODK 1983.</li> <li>2. Muster A.: KUCIE MATRYCOWE Projektowanie procesów technologicznych, Oficyna Wydawnicza Politechniki Poznańskiej, Warszawa 2002.</li> <li>3. Zalecenia do obróbki plastycznej metali. Instytut Obróbki Plastycznej - Poznań.</li> <li>4. M. Ustasiak, P. Kochmański: OBRÓBKA PLASTYCZNA Materiały pomocnicze do projektowania, Politechnika Szczecińska, Szczecin, 2004.</li> </ol>		
<b>Result of average student's workload</b>		
Activity	Time (working hours)	
1. Lecture	15	
2. Classes	15	
3. Consultation	5	
4. Exam	5	
5. Student's own work	20	
<b>Student's workload</b>		
Source of workload	hours	ECTS
Total workload	60	2
Contact hours	40	1

Practical activities	15	0
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