

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Technology of production</b>		Code <b>1011101331010246777</b>
Field of study <b>Logistics - Full-time studies - First-cycle studies</b>	Profile of study (general academic, practical) <b>general academic</b>	Year /Semester <b>2 / 3</b>
Elective path/specialty <b>-</b>	Subject offered in: <b>Polish</b>	Course (compulsory, elective) <b>elective</b>
Cycle of study: <b>First-cycle studies</b>	Form of study (full-time, part-time) <b>full-time</b>	
No. of hours Lecture: <b>30</b> Classes: <b>-</b> Laboratory: <b>45</b> Project/seminars: <b>-</b>		No. of credits <b>3</b>
Status of the course in the study program (Basic, major, other) <b>other</b>		(university-wide, from another field) <b>university-wide</b>
Education areas and fields of science and art <b>technical sciences</b> <b>Technical sciences</b>		ECTS distribution (number and %) <b>3 100%</b> <b>3 100%</b>
<b>Responsible for subject / lecturer:</b> dr inż. Magdalena Suchora-Kozakiewicz email: magdalena.suchora@put.poznan.pl tel. 616652403 Wydział 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>	Has basic knowledge in the fields of study related to the studied field of study.
2	<b>Skills</b>	Has basic knowledge in the fields of study related to the studied field of study.
3	<b>Social competencies</b>	Understands the need to learn throughout life; can inspire and organize the learning process of other people and can interact and work in a group, taking on different roles.
<b>Assumptions and objectives of the course:</b> Understanding the theoretical basis and the course of manufacturing processes of plastic products, shaped by plastic forming and casting		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. Has basic knowledge of: engineering graphics; construction and technology as well as construction and operation of machines, necessary for the implementation of tasks in the field of manufacturing technology. - [[K1A_W05]]		
2. Has basic knowledge in the field of: mechanics and machine construction as well as strength of materials, necessary for the implementation of tasks in the field of manufacturing technology. - [[K1A_W07]]		
<b>Skills:</b>		
1. Is able to independently develop a given problem in the field of manufacturing technology. - [[K1A_U05]]		
2. Is able to formulate and solve a design task in the field of manufacturing technology using analytical methods. - [[K1A_U09]]		
<b>Social competencies:</b>		
1. Understands the need to learn throughout life; can inspire and organize the learning process of other people. - [[K1A_K01]]		
2. He can interact and work in a group, taking on different roles. - [[K1A_K03]]		
<b>Assessment methods of study outcomes</b>		

Lectures: forming evaluation - activity cards, summary evaluation - written exam. And part of the selection test assessed 1 point. for a good answer from 15 questions asked and 4 problem questions evaluated after 5 points. for every good answer. Problem questions are rated on a scale (0-5 points). In total, you can get 35 points for an error-free test solution. A positive assessment is obtained after obtaining 21 points.

Laboratories: forming evaluation - presence on all classes; positive answers to the teacher's written or oral questions, summary assessment - the average of the marks obtained from oral or written answers and the adoption by the operator of the final report.

**Course description**

**Lecture:**

Fundamentals of metallurgical processes. Preservation of basic metals from ores. The process of smelting pig iron in a blast furnace. Smelting of steel and cast steel. Smelting of cast iron and non-ferrous alloys. Technological process of casting in the form. Typical casting equipment. Phenomena occurring during solidification of the cast in the casting mold. Casting into sand molds and methods of mechanical compaction of molds. Designing pouring and casting systems. Special casting methods: casting into ceramic molds (one-time use) and metal molds (permanent molds). The process of cleaning up castings and separating the fill and headgear systems. Casting defects.

Plastics. Division. Special additives for plastics. Plastic processing. Basic techniques of manufacturing plastic products: injection technology, laminating technology, extrusion technology, vacuum forming technology. Techniques for joining plastic products. Applying plastic coatings. Rotational casting. Methods of elastomer processing

Basic theoretical information about the plastic shaping of metals and their alloys (plasticity conditions, plastic deformation mechanism). Technological operations of shaping sheet metal products (cutting, bending, stamping) and rods (forging, rolling, extrusion, drawing). Materials susceptible to plastic forming. Change of material properties during shaped products by plastic forming methods. General information about tool materials and technological lubricants. Examples of technological processes

**Lab:**

Research on selected properties of molding / core sand. Making casts using the manual forming method. Special casting methods: shell casting, die casting, casting into shell molds, casting using the model of melting. Computer simulation of technological processes, Classification of casting defects and analysis of their occurrence.

Acquainting with the basic technologies of plastics processing: injection, laminating, extrusion, vacuum forming. Connecting plastics. Applying plastic coatings.

Cutting of sheets using guillotine and roller shears. Bending with a bending machine and press brake. Punching cylindrical and rectangular pressings using a hydraulic press. Free upset with a drop hammer.

Drop forging using a screw press and extrusion using a hydraulic press. Longitudinal and transverse rolling with the help of laboratory mills.

**Teaching methods:**

Lecture - informative and conversational lecture.

Laboratories - laboratory method.

**Basic bibliography:**

**Additional bibliography:**

**Result of average student's workload**

Activity	Time (working hours)
1. Lectures	30
2. Laboratory	45
3. Consultation	5
4. Preparation for classes	10

**Student's workload**

<b>Source of workload</b>	<b>hours</b>	<b>ECTS</b>
Total workload	90	3
Contact hours	80	3
Practical activities	45	1