

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Mechanics and Strength of Materials		Code 1011101311010210975
Field of study Logistics - Full-time studies - First-cycle studies	Profile of study (general academic, practical) general academic	Year /Semester 1 / 1
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: 30 Classes: 30 Laboratory: 15 Project/seminars: -		No. of credits 5
Status of the course in the study program (Basic, major, other) other		(university-wide, from another field) university-wide
Education areas and fields of science and art technical sciences Technical sciences		ECTS distribution (number and %) 5 100% 5 100%
Responsible for subject / lecturer: dr inż. Piotr Kędzia email: piotr.kedzia@put.poznan.pl tel. 616652069 Wydział Budowy Maszyn i Zarządzania ul. Piotrowo 3, 60-965 Poznań		Responsible for subject / lecturer: dr inż. Zygmunt Sekulski email: zygmunt.sekulski@put.poznan.pl tel. 616652325 Wydział Budowy Maszyn i Zarządzania ul. Piotrowo 3, 60-965 Poznań
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Basic in mathematics and physics, knowledge and understanding of mathematics (study of functions, algebraic transformations)
2	Skills	Student can study functions, operate basic geometrical and trigonometric relations, has the ability to logically think
3	Social competencies	Understands the need to acquire new knowledge, is aware of mutual dependencies between mathematical knowledge, physical knowledge and technical sciences.
Assumptions and objectives of the course: Mastering basic principles in the field of mechanics and strength analysis. Understanding the theoretical and practical problems related to strength analysis based on mechanical properties of materials as a basis for proper design of machines and devices.		
Study outcomes and reference to the educational results for a field of study		
Knowledge: 1. Has knowledge of physics including mechanics, thermodynamics, optics, electricity and magnetism, nuclear physics and solid state physics, including knowledge necessary to understand technical issues related to logistics - [K1A_W02] 2. Has basic knowledge in the field of: mechanics and machine construction as well as strength of materials - [K1A_W07]		
Skills: 1. Has the ability to self-education in the field of mechanics and strength of materials - [K1A_U05] 2. Can use to formulate and solve engineering tasks in the field of mechanics and strength of materials, analytical, simulation and experimental methods - [K1A_U09] 3. Is able to make a critical analysis of the functioning and evaluate - especially in connection with the mechanics and durability of materials - existing technical solutions, in particular devices, objects, systems, processes, services - [K1A_U13]		
Social competencies: 1. Understands the need to learn throughout life; can inspire and organize the learning process of other people - [K1A_K01]		
Assessment methods of study outcomes		

<p>Lecture: formative assessment - written tests, summary evaluation - arithmetic mean of grades obtained as part of the forming assessment</p> <p>Exercises: formative assessment - written tests, summary evaluation - arithmetic mean of grades obtained as part of the forming assessment</p> <p>Laboratories: forming evaluation - oral and written answer, written reports from each laboratory, summary evaluation - arithmetic mean of grades obtained as part of the forming evaluation</p> <p>The credit includes three tests during the semester, which are scored on points. The student receives a positive pass mark, if he receives at least 50% of the points possible from each of the colloquiums. The final grade for the pass is determined according to the following rules:</p> <p>Very good - if the total number of points obtained from all tests is over 90% of the total number of points possible to get, Good plus - 80.1 - 90.0% points, Good-70.1 - 80.0% Sufficient plus - 60, 1 - 70.0%, Sufficient - 50.0 - 60.0%.</p> <p>A student who has received an unsatisfactory grade has the opportunity to take one correction. Laboratory classes: Credits based on: oral or written answer in each exercise and reports on each exercise. The condition for passing laboratory classes is passing all the exercises covered by the program and the adoption by the teacher of all reports.</p>	
Course description	
<p>Lecture and exercises:</p> <ol style="list-style-type: none"> 1. Basic concepts of mechanics. Definition of strength, division of forces, systems of forces. Moment of force relative to the pole. 2. The axiom statics). 3. Ties and reactions of bonds. 4. The center of gravity of the body. 5. The conditions of the equilibrium of plane systems of forces. 6. Mechanical properties of materials. 7. Internal forces and unitary forces (stresses). 8. Stretching and squeezing rods. Hooke's law. Bar systems. 9. Static tensile test. Permissible stresses and safety factor of the structure. 10. Stress / compression strength condition. 11. Assembly and thermal stress. 12. Moments of inertia of flat figures. Steiner's theorem. 13. Twisting bars with circular cross-sections. 14. Bending of straight beams, determining lateral forces and bending moments. Beam deflection line. <p>Laboratory exercises:</p> <ol style="list-style-type: none"> 1. Static tensile test. 2. Hardness measurements by the methods: Brinell, Vickers and Poldi. 3. Rockwell hardness measurement. Measurement of microhardness using the Vickers method. 4. Fatigue of the material. The Locati test. 5. Attempt of bending impact. Characteristics of springs. 6. Static tensometric measurements <p>Teaching methods:</p> <p>Lecture - informative and conversational lecture</p> <p>Exercises - a method of training</p> <p>Laboratory - laboratory method</p>	
<p>Basic bibliography:</p> <ol style="list-style-type: none"> 1. Ostwald M., Podstawy wytrzymałości materiałów, Wydawnictwo PP, Poznań, 2007. 2. Ostwald M., Wytrzymałość materiałów. Zbiór zadań. Wydawnictwo PP, Poznań, 2008. 3. Badania eksperymentalne w wytrzymałości materiałów. Pod redakcją S. Joniaka, WPP. 2006. 4. Misiak J., Mechanika techniczna t.1, WNT, Warszawa, 1998, 2012. 	
<p>Additional bibliography:</p> <ol style="list-style-type: none"> 1. Magnucki K., Szyk W., Wytrzymałość materiałów w zadaniach: pręty, płyty i powłoki obrotowe, Wydawnictwo Naukowe PWN, 2000. 2. Dyląg Z., Jakubowicz A., Orłóś Z., Wytrzymałość materiałów t.1 i 2, WNT, Warszawa, 2000. 	
Result of average student's workload	
Activity	Time (working hours)
1. Lectures	30
2. Laboratory	15
3. Classes	30
4. Consultation	10
5. Final test	5
6. Preparation to the final test	10
7. Preparation to laboratory and classes	20

Student's workload		
Source of workload	hours	ECTS
Total workload	120	5
Contact hours	90	4
Practical activities	45	2