

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Mechanics and Strength of Materials		Code 1011104411010210975
Field of study Logistics - Part-time studies - First-cycle	Profile of study (general academic, practical) (brak)	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) part-time	
No. of hours Lecture: 10 Classes: 10 Laboratory: - Project/seminars: -		No. of credits 3
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		ECTS distribution (number and %)
Responsible for subject / lecturer: dr Marcin Rodak email: marcin.rodak@put.poznan.pl tel. 61 665-2175 Faculty of Mechanical Engineering and Management ul. Piotrowo 3 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	basic knowledge of mathematics and physics including analysis of functions and algebraic transformations
2	Skills	A student can analyse functions, use basic geometrical relationships and trigonometric functions, can think logically
3	Social competencies	A student understands the need of lifelong learning and is aware of connections between mathematics, physics and technical subjects
Assumptions and objectives of the course: The aim of course is learning the basic principles of mechanics and strength analysis. Becoming familiar with theoretical and practical aspects of strength analysis based on material properties and being the basis of proper machinery design.		
Study outcomes and reference to the educational results for a field of study		
Knowledge: 1. A student knows the basic concepts of mechanics: statics, dynamics and kinematics, knows and understands the principles of statics and conditions for the equilibrium of a coplanar force system. - [K1A_W02, K1A_W07] 2. A student can calculate external and internal forces and moments, knows how to determine stresses and displacements in bars and trusses, can solve problems of torsion of cylindrical shafts. - [K1A_W07] 3. A student can determine normal bending stresses and deflection of beams and have theoretical and practical knowledge about experimental strength investigations. - [K1A_W02, K1A_W07]		
Skills: 1. A student can formulate and understand basic sentences using the language of mechanics. - [K1A_U05, K1A_U09] 2. A student can formulate and solve problems of strength of materials considering tensile and compressive loads. - [K1A_U05, K1A_U09] 3. A student can think logically. - [K1A_U13]		
Social competencies: 1. A student can understand the need of lifelong learning and can cooperate and work in a group. - [K1A_K01, K1A_K03] 2. A student is aware of and understand the importance of the structural analysis in design and validation of machinery. - [K1A_K04]		
Assessment methods of study outcomes		

Students' knowledge is checked regularly. There are two tests in a semester. In order to receive a positive grade and pass the course a student needs to achieve more than 50% of maximum points in each test. The final grade is based on the following rules:

very good ? if the ratio of sums of achieved and maximum points is bigger than 90%,
 good plus ? if the ratio of sums of achieved and maximum points is between 80.1-90%,
 good ? if the ratio of sums of achieved and maximum points is between 70.1-80%,
 sufficient plus ? if the ratio of sums of achieved and maximum points is between 60.1-70%,
 sufficient ? if the ratio of sums of achieved and maximum points is between 50.1-60%,

Students who receive a negative grade can take an additional test and correct their grades.

Course description

Lectures and classes:

1. Fundamentals of statics. Definitions of force, system of forces, moment of a force about a point
2. The principles of statics (axioms)
3. Constraints and reaction forces / moments
4. The centre of gravity of a body
5. Conditions for the equilibrium in a plane
6. Mechanical properties of material
7. Internal resultant forces and stresses
8. Tension and compression of bars, Hooke's law, trusses
9. Tensile test, allowable stresses, factor of safety
10. Tensile and compression strength conditions
11. Moments of inertia of plane figures, Steiner's theorem
12. Torsion of cylindrical shafts
13. Bending of beams, shear forces and bending moments, deflection of beams

Basic bibliography:

1. Misiak J., Mechanika techniczna t.1, WNT, Warszawa, 1998, 2012.
2. Ostwald M., Podstawy wytrzymałości materiałów, Wydawnictwo PP, Poznań, 2007.
3. Ostwald M., Wytrzymałość materiałów. Zbiór zadań. Wydawnictwo PP, Poznań, 2008.

Additional bibliography:

1. Magnucki K., Szyc W., Wytrzymałość materiałów w zadaniach: pręty, płyty i powłoki obrotowe, Wydaw. Naukowe PWN, 2000.
2. Dyląg Z., Jakubowicz A., Orłoś Z., Wytrzymałość materiałów t.1 i 2, WNT, Warszawa, 2000.

Result of average student's workload

Activity	Time (working hours)
1. Lectures	10
2. Classes	10
3. Office hours	5
4. Classes preparation	10
5. Tests preparation	15

Student's workload

Source of workload	hours	ECTS
Total workload	50	3
Contact hours	20	1
Practical activities	30	2