STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Technical mechanics**		Code **1010601221010211300**
Field of study **Transport**	Profile of study (general academic, practical) **(brak)**	Year /Semester **1 / 2**
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				No. of credits **2**
Lecture: **1**	Classes: **1**	Laboratory: **-**	Project/seminars: **-**	

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:

dr inż. Hubert JOPEK
email: hubert.jopek@put.poznan.pl
tel. +4861 665-2390
Wydział Budowy Maszyn i Zarządzania
ul. Jana Pawła II 24, 60-965 Poznań

Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Basic math, including: bill vector, the elements of calculus and the basics of physics and mechanics
2	**Skills**	The ability to model basic mechanical phenomena, the presentation and reading of geometry, the ability to constructive and analytical thinking. The ability to use commonly available materials.
3	**Social competencies**	Understanding the needs of education, improving knowledge, the role of the designer and his responsibility for their work

Assumptions and objectives of the course:

Broaden students' knowledge in the field of mechanics (ie, statics, kinematics and dynamics), and in particular to provide them with the tools necessary for the theoretical analysis of the machines, which is essential in the later stages of teaching subjects related to the design of machines and equipment.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. The student has a basic, structured theoretical knowledge of mechanics, ie statics, kinematics and dynamics - [K1A_W04]

Skills:

1. The student can obtain information from the literature, the Internet, databases and other sources, in Polish and foreign, can integrate the information obtained to interpret and draw conclusions from them, and create and justify opinions - [K1A_U01]

2. The student can make modeling specific component or the mechanical system and is able to determine the equilibrium conditions of the system and determine the reactions of the bonds - [K1A_U10]

3. Student is able to determine the theoretical position of the center of gravity of solids - [K1A_U10]

4. The student can describe mathematically modeled and movement of the mechanical system - [K1A_U10]

5. Student is able to make a traffic modeling point of the material under the influence of the forces - [K1A_U10]

6. Can use mathematical theories learned to create and analyze models and design - [K1A_U10]

Social competencies:

1. is aware of the importance and understanding of the social impact of engineering activities - [K1A_K02]

Assessment methods of study outcomes

Lecture on the basis of written and oral examination.
Assessment of exercise on the basis of test.

Course description
Basics of vector calculus, the axioms of statics, types of bonds, internal and external forces. Terms of planar and spatial balance of forces converging, and the equilibrium conditions of any planar and spatial alignment of forces - integrated statically determinate. Reduction of forces, force couple. The law of friction, dry friction bearings and friction tendons. Kinematics equations of motion of a point, the movement of the point on the track, speed and acceleration in Cartesian and natural coordinates. Rigid body movement speed and acceleration of any point of the solid, rotation and movement of the flat block. Dynamics: the dynamics of two basic tasks: simple and opposite, the principle of d'Alembert, geometrical characteristics of objects: the moments I and II order. The principle of momentum and impulse, the principle of conservation of momentum, Theorem about the center of mass, angular momentum principle and pokrętu.

Basic bibliography:

1. Sałata W., Mechanika ogólna w zarysie, Poznań, Wyd. PP 1998.

2. Leyko J., Mechanika ogólna. T. 1-2, Warszawa, PWN 2012

3. Misiak J. Zadania z mechaniki ogólnej. Część I, II, III Warszawa, WNT 2012

4. Nizioł J. Metodyka rozwiązywania zadań z mechaniki. Warszawa, WNT 2002

5. Niezgodziński T., Mechanika ogólna, Warszawa, PWN, 2011

Additional bibliography:

1. Osiński Z. Mechanika ogólna. Warszawa, PWN 2000

2. Taylor J., Mechanika klasyczna T1-2 Warszawa PWN 2013

Result of average student's workload	
Activity	**Time (working hours)**
1. Preparation for lectures	3
2. Participation in the lecture	15
3. Fixation of the lecture	7
4. Consultation	1
5. Preparing to pass	10
6. Participation in the successful completion of the course	2
7. Participation in class exercises	15
8. Preparing to pass	5
9. Participation in completing	4

Student's workload		
Source of workload	**hours**	**ECTS**
Total workload	62	2
Contact hours	37	1
Practical activities	0	0