

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Fundamentals of mechanics		Code 1010101111010114898
Field of study Civil Engineering First-cycle Studies	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) full-time	
No. of hours Lecture: 15 Classes: 15 Laboratory: - Project/seminars: 15		No. of credits 5
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 Technical sciences		ECTS distribution (number and %) 6 100% 6 100%
Responsible for subject / lecturer: dr inż. Maciej Przychodzki email: maciej.przychodzki@put.poznan.pl tel. 665-2697 Faculty of Civil and Environmental Engineering ul. Piotrowo 5 60-965 Poznań		Responsible for subject / lecturer: dr inż. Magdalena Łasecka-Plura email: magdalena.lasecka@put.poznan.pl tel. 665-2697 Faculty of Civil and Environmental Engineering ul. Piotrowo 5 60-965 Poznań
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Basic knowledge of the vector calculus and the mathematical analysis.
2	Skills	Capability to apply the vector calculus and calculate derivatives and integrals of simple functions.
3	Social competencies	Understanding the necessity of constant actualization and complementation of knowledge and skills.
Assumptions and objectives of the course: The aim of this subject is to prepare the student to be able to solve two- and three-dimensional static tasks and simple problems of dynamics of particles systems and rigid bodies.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Student knows the equilibrium conditions for two- and three-dimensional forces sets - [K_W04] 2. Student knows methods of calculation of internal forces in statically determined plane bar systems - [K_W04] 3. Student knows the principle of virtual work - [K_W04]		
Skills:		
1. Student can determine reactions in two- and three-dimensional bar systems - [K_U04] 2. Student can determine internal forces in two- dimensional statically determined bar systems - [K_U04] 3. Student can apply the principle of virtual work to determine reactions and internal forces - [K_U04]		
Social competencies:		
1. Student can work independently on specific task - [K_K01] 2. Student is responsible for the accuracy of obtained results of his work and their interpretation - [K_K02] 3. Student can formulate conclusions and describe results of his own work - [K_K09]		
Assessment methods of study outcomes		

1 written test during the semester, 3 individual exercises, Written examination.		
Course description		
Elements of vector calculus, moment of a vector about a point, and about a given axis. Principles of statics. Moment of a couple and its properties. Reduction of a system of forces. Resultant equilibrium of a system of forces. Constrains, degrees of freedom. Conditions of geometrical invariability of a system of rigid bodies. Statically determined systems. Internal forces in beams and frames. Differential equilibrium equations of bars. Internal forces in statically determined trusses. Friction and the laws of dry friction. Rolling resistance. Principle of virtual work and its applications.		
Basic bibliography: 1. J. Leyko, Mechanika ogólna. T. 1, Statyka i kinematyka, T. 2, Dynamika, PWN, Warszawa 2006 2. J. Misiak, Mechanika ogólna. T. 1, Statyka i kinematyka, T. 2, Dynamika, WNT Warszawa 1998 3. Z. Cywiński, Mechanika budowli w zadaniach. Układy statycznie wyznaczalne, PWN Warszawa 1999		
Additional bibliography: 1. F. P. Beer, E. R. Johnston, Vector Mechanics for Engineers, Statics, International Student Edition, McGraw-Hill Book Company Japan, Tokyo 1984 2. J. F. Shelley, Engineering Mechanics, Dynamics, McGraw-Hill Book Company 1980		
Result of average student's workload		
Activity	Time (working hours)	
1. Participation in lectures	15	
2. Participation in tutorials	15	
3. Participation in projects	15	
4. Solving and preparing of project tasks	12	
5. Consultations	5	
6. Preparation to the written tests	15	
7. Independent research of the literature	10	
8. Preparation to the examination	30	
9. Examination	3	
Student's workload		
Source of workload	hours	ECTS
Total workload	145	6
Contact hours	55	3
Practical activities	60	3