

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Structural engineering</b>		Code <b>1010134241010110904</b>
Field of study <b>Environmental Engineering Extramural First-</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>2 / 4</b>
Elective path/specialty <b>-</b>	Subject offered in: <b>Polish</b>	Course (compulsory, elective) <b>obligatory</b>
Cycle of study: <b>First-cycle studies</b>	Form of study (full-time, part-time) <b>part-time</b>	
No. of hours Lecture: <b>15</b> Classes: <b>-</b> Laboratory: <b>-</b> Project/seminars: <b>10</b>		No. of credits <b>2</b>
Status of the course in the study program (Basic, major, other) <b>(brak)</b>		(university-wide, from another field) <b>(brak)</b>
Education areas and fields of science and art <b>technical sciences</b> <b>Technical sciences</b>		ECTS distribution (number and %) <b>2 100%</b> <b>2 100%</b>
<b>Responsible for subject / lecturer:</b> dr inż. Mariusz Gaczek email: mariusz.gaczek@put.poznan.pl tel. 616652481 Budownictwa i Inżynierii Środowiska ul. Piotrowo 5, 60-965 Poznań		<b>Responsible for subject / lecturer:</b> dr inż. Ewa Oleszkiewicz email: ewa.oleszkiewicz@put.poznan.pl tel. 616652107 Budownictwa i Inżynierii Środowiska ul. Piotrowo 5 60-965 Poznań
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	Basis of mathematics
2	<b>Skills</b>	Elements of the theory of differential equations and integral calculations
3	<b>Social competencies</b>	Student is responsible for performed calculations
<b>Assumptions and objectives of the course:</b> The main objective of mechanics and strength of materials course is to develop in the engineering student the ability to analyze a given problem in a simple and logical manner and to apply a few fundamental and well-understood principles. The student will be able to develop all the necessary formulas and to clearly indicate to conditions under which they can be safely applied to the analysis of design of actual engineering structures.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. Student knows the methods of determining internal forces in structural members - [-]		
2. Student knows basic concepts and classification of materials used in engineering structures - [-]		
<b>Skills:</b>		
1. Student can determine internal forces in plane structures - [-]		
2. Student can determine normal and shear stresses in various structural members - [-]		
3. Student understands the basic concepts of stress, strain, deformation, and material behavior under different types of loading: axial, torsion, bending - [-]		
4. Student can perform stress analysis and design of beams subjected to bending and shearing loads - [-]		
<b>Social competencies:</b>		
1. The student is aware of the responsibility that lies with the person conducting the structural calculations - [-]		
2. The student uses a variety of computational methods to eliminate possible errors (check calculations) - [-]		
<b>Assessment methods of study outcomes</b>		

<p>Exam in the form of a test: 15-20 questions.          Three control works - projects:          1. Properties of structural section          2. Internal forces in trusses, beams and frames          3. Beams design problems</p>		
<b>Course description</b>		
<p>Topics:          1. Basing principles of statics.          2. Properties of structural section - area, centroid, moment of inertia and product of inertia of plane area.          3. Basic assumptions and concepts in the theory of construction.          4. Structural elements and loading.          5. Internal forces.          6. Trusses, beams, frames and arcs.          7. Mechanical properties: elasticity, plasticity, buckling.          8. Strength, stiffness and stability conditions.          9. Stress-strain behavior.          10. Beams design problems.          11. Deformations of axial members.          12. Eccentric loading.          13. Statics.          14. Stresses in thin-walled tanks.</p>		
<p><b>Basic bibliography:</b>          1. Przewłócki J., Górski J., Podstawy mechaniki budowli, Arkady, Warszawa 2008          2. Zielnica J., Wytrzymałość materiałów, Wyd. PP, 1996          3. Wytrzymałość materiałów. Zarys teorii, przykłady, zadania. (Pr. zbiorowa pod redakcją K. Wrześniowskiego), 1985</p>		
<p><b>Additional bibliography:</b>          1. Orłowski W., Słowański L., Wytrzymałość materiałów. Przykłady obliczeń. Arkady, Warszawa 1978          2. Cywiński Z., Mechanika budowli w zadaniach, PWN 1997          3. Leyko J., Mechanika ogólna, PWN, Warszawa 2007          4. Dyląg Z., Jakubowicz A., Orłowski Z., Wytrzymałość materiałów, WNT 1999          5. Dębiński J., Siły przekrojowe w układach statycznie wyznaczalnych, Wyd. PP 2011          6. Ostwald M. Wytrzymałość materiałów. Zbiór zadań. Wyd. PP 2012          7. Jastrzębski P., Mutermilch J., Orłowski W., Wytrzymałość materiałów, Arkady, Warszawa 1986</p>		
<b>Result of average student's workload</b>		
<b>Activity</b>	<b>Time (working hours)</b>	
1. Lectures	15	
2. Projects	10	
3. Preparation of examples	10	
4. Preparation to an exam	13	
5. Exam	2	
<b>Student's workload</b>		
<b>Source of workload</b>	<b>hours</b>	<b>ECTS</b>
Total workload	50	2
Contact hours	25	1
Practical activities	25	1