STUDY MODULE DESCRIPTION FORM

Name of the module/subject **(-)**		Code **1010104111010113278**
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) **part-time**	
No. of hours Lecture: **20** Classes: **15** Laboratory: **-** Project/seminars: **10**		No. of credits **7**
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 %) **7 100%**

Responsible for subject / lecturer:

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Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Basic knowledge of mathematics and physics.
2	**Skills**	The student has the ability to self-learning, can acquire information from literature, databases and other sources.
3	**Social competencies**	The student understands the need for learning throughout life, is able to interact and work in a group.

Assumptions and objectives of the course:

Get to know the fundamentals of statics and kinematics of the material point and rigid body, which is necessary for further study of the strength of materials, structural mechanics and theory of elasticity and plasticity.

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

Knowledge:

1. Student knows: conditions of geometrical invariability of a system of rigid bodies. - [-]
2. Equilibrium of a system of forces. - [-]
3. Methods of determining of internal forces in statically determined plane structures. - [-]

Skills:

1. Student can: identify statically determined and geometrically invariable structural systems. - [-]
2. Determine reaction forces in plane structures. - [-]
3. Determine internal forces in plane trusses, beams and frames. - [-]
4. Draw the diagrams of internal forces in beams and frames. - [-]

Social competencies:

1. Students can organize the learning process. - [-]
2. Correctly identifies and solves problems. - [-]
3. Has the ability of defining priorities for the implementation of a specific task. - [-]

Assessment methods of study outcomes

- classes are passed in the case of positive marks (at least E) in each from two tests (duration of each test 90 minutes), dates are given at the beginning of the semester,
- project classes are passed in the case of positive marks (at least E) in 4 project tasks; evaluation depends on the result of the discussion on issues related to the project
- the subject is finished by written exam (duration 3x45 minutes), dates are given at the beginning of the semester.

Course description

Newton's laws of mechanics. Elements of vector calculus: force, moment of a force about a point and about an axis. Force couple and its properties. Reduction of a system of forces. Resultant force. Equilibrium of a system of forces. Degrees of freedom. Constraints and reaction forces. Conditions of geometrical invariability of a system of rigid bodies. Statically determined systems. Internal forces in statically determined plane structures: systems of rigid bodies, truss structures, beams and plates. Differential equations of internal equilibrium in beams. Friction and the laws of dry friction. Kinematics of particles. Free vibrations, forced vibrations and damped vibrations. Kinetic and potential energy.

Basic bibliography:

1. Przewłócki J., Górski J.: Podstawy mechaniki Budowli. Arkady, Warszawa, 2006
2. Leyko J.: Mechanika ogólna. PWN, Warszawa, 2008
3. Grabowski J., Iwanczewska A.: Zbiór zadań z wytrzymałości materiałów. Oficyna Wydawnicza Politechniki Warszawskiej, 2006
4. Dębiński J.: Siły przekrojowe w układach statycznie wyznaczalnych. Wydawnictwo Politechniki Poznańskiej, 2011
5. Beer F. P., Johnston E. R.: Vector Mechanics for Engineers, Statics, International Student Edition, McGraw-Hill Book Company Japan, Tokyo 1984.
6. Shelley J. F.: Engineering Mechanics, Dynamics, McGraw-Hill Book Company 1980.

Additional bibliography:

1. Praca zbiorowa: Wytrzymałość materiałów. Zarys teorii, przykłady, zadania. Część I. Wydawnictwo PP, 1992
2. Cywiński Z.: Mechanika budowli w zadaniach. Układy statycznie wyznaczalne. PWN Warszawa, 2006.

Result of average student's workload

Activity	Time (working hours)
1. Participation in the lectures	20
2. Participation in the classes	15
3. Participation in the project classes	10
4. Continuation of the projects	48
5. Participation in the consultations	10
6. Exercises before classes tests	40
7. Exercises before projects defense	15
8. Exercises before final exam	35
9. Participation in the exam	3

Student's workload

Source of workload	hours	ECTS
Total workload	196	7
Contact hours	45	2
Practical activities	10	1