



MODULE SPECIFICATION

Module code	
Module title in Polish	Mechanika budowli i konstrukcji
Module title in English	Structural Mechanics
Module running from the academic year	

A. MODULE IN THE CONTEXT OF THE PROGRAMME OF STUDY

Field of study	Surveying and Cartography
Level of qualification	first cycle (first cycle, second cycle)
Programme type	academic (academic/practical)
Mode of study	full-time (full-time/part-time)
Specialism	Engineering and Industrial Survey
Organisational unit responsible for module delivery	The Department of Building Physics and Renewable Energy
Module co-ordinator	Jerzy Piotrowski, PhD hab., Eng., Professor of the University
Approved by:	

B. MODULE OVERVIEW

Module type	core module (core/programme-specific/elective HES*)
Module status	Non-compulsory (compulsory/optional)
Language of module delivery	English
Semester in the programme of study in which the module is taught	semestr 5
Semester in the academic year in which the module is taught	Winter semester (winter semester/summer semester)
Pre-requisites	No requirements (module code/module title, where appropriate)
Examination required	No (Yes/No)
ECTS credits	1

* elective HES – elective modules in the Humanities and Economic and Social Sciences

Mode of instruction	lectures	classes	laboratories	project	others
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Politechnika Świętokrzyska

WYDZIAŁ INŻYNIERII ŚRODOWISKA, GEOMATYKI I ENERGETYKI

Total hours per semester	15				
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C. LEARNING OUTCOMES AND ASSESSMENT METHODS

Module aims	The aim of the module is to familiarise students with the types of loads occurring in building structures and static systems. The following aspects will be discussed: the conditions and consequences of changing the method of utilising, purpose, and the impact on construction systems.
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Module outcome code	Module learning outcomes	Mode of instruction (l/c/lab/p/ others)	Corresponding programme outcome code	Corresponding discipline-specific outcome code
W_01	A student knows basic structure loads, systems of forces, calculation diagrams, static systems and design stages.	l	GiK_W01 GiK_W12 GiK_W21 GiK_W26	T1A_W01 T1A_W03 T1A_W06 T1A_W07
W_02	A student knows geometrical characteristics of plane figures, the occurring stresses and deformations together with the principles of dimensioning sections.	l	GiK_W01 GiK_W12 GiK_W26 GiK_W27	T1A_W01 T1A_W03 T1A_W06 T1A_W07
W_03	A student has knowledge on static systems, buckling relationships, stresses during pressing, stretching, shearing, bending, and torsion (together with the directions of deformations).	l	GiK_W01 GiK_W12 GiK_W21 GiK_W27	T1A_W01 T1A_W03 T1A_W07
W_04	A student has knowledge on basic structures which are varied in terms of the materials used: timber, brick, steel, concrete, reinforced concrete, compresses (as well as rod, truss, surface, and spatial systems).	l	GiK_W01 GiK_W26	T1A_W01 T1A_W06 T1A_W07
W_05	A student has knowledge concerning the conditions of changing the methods of utilisation, purpose, consequences, and their impact on the construction systems.	l	GiK_W16 GiK_W17 GiK_W26	T1A_W03 T1A_W04 T1A_W05 T1A_W06 T1A_W07
U_01	A student can identify the systems of forces and loads, the occurring calculation diagrams; furthermore, a student can present the characteristic and plane figures, static systems, and the occurring stresses and deformations.	l	GiK_U18 GiK_U21	T1A_U09 T1A_U13 T1A_U15
U_02	A student is able to present basic structures which are varied in terms of the materials applied (also varied structurally and spatially); a student can also interpret changes in the structure which result from their use and loads.	l	GiK_U21 GiK_U26	T1A_U13 T1A_U15 T1A_U16
K_01	A student is aware of the effects of incorrect interpretation of technical dependencies.	l	GiK_K03	T1A_K02
K_02	A student is aware of the responsibility for the reliably completed engineering assignment.	l	GiK_K06 GiK_K07	T1A_K03

Module content:

- Topics to be covered in the lectures

No.	Topics	Module outcome code
1	The definitions of notions. Basic types of structure loads: constant, variable, snow-related, water-related, and exceptional loads. Systems of forces, the	W_01



	conditions of equilibrium, internal and section forces, as well as moments. The types of supports. Simple single-bay beams, multi-bay, simply supported beams, partly-fixed and fully-fixed. Frames, arches, trusses, surface and spatial systems. Design stages.	
2	Centre of gravity and static moments of sections, inertia moments of sections, the indicators of resistance to bending (inertia radiuses). Stresses and deformations. Dimensioning sections.	W_01
3	Static systems, stresses and definitions. Smoothness, bucklings and its impact on the load bearing capacity of the element. Axial and eccentric pressing, stretching, shearing, shearing stresses in joints, simple and diagonal bending, and torsion. Deformations, the directions of bucklings, deflections, scratches and cracks.	W_01 W_02 W_03
4	Structure types, material, spatial, functional, and functional differentiation. Timber structures and wood-based material structures; brick walls and partition walls from ceramics, gas concrete, standard concrete, and silicates. Steel rod systems, nodes and joints. Concrete, reinforced concrete and compressed structures. The distribution of forces in supports, the types of rods in trusses; determining forces in rods; the principles of shaping trusses, boards, foundation grillages, domes, coatings, and folded plate structures.	W_01
5	The fundamentals of obtaining the change of utilisation method; the range of functional loads, the change of its purpose and functions. The impact of the change of utilisation method on a load, deformation, bend, static systems and construction systems.	W_01 W_02 W_03

Assessment methods

Module outcome code	Assessment methods <i>(Method of assessment; for module skills – reference to specific project, laboratory and similar tasks)</i>
W_01	A test
W_02	A test
W_03	A test
W_04	A test
W_05	A test
U_01	A test
U_02	A test
K_01	A test
K_02	A test



D. STUDENT LEARNING ACTIVITIES

ECTS summary		
	Type of learning activity	Study time/ credits
1	Contact hours: participation in lectures	15
2	Contact hours: participation in classes	
3	Contact hours: participation in laboratories	2
4	Contact hours: attendance at office hours (2-3 appointments per semester)	
5	Contact hours: participation in project-based classes	
6	Contact hours: meetings with a project module leader	
7	Contact hours: attendance at an examination	
8		
9	Number of contact hours	17 <i>(total)</i>
10	Number of ECTS credits for contact hours <i>(1 ECTS credit = 25-30 hours of study time)</i>	0.68
11	Private study hours: background reading for lectures	
12	Private study hours: preparation for classes	3
13	Private study hours: preparation for tests	
14	Private study hours: preparation for laboratories	5
15	Private study hours: writing reports	
16	Private study hours: preparation for a final test in laboratories	
17	Private study hours: preparation of a project/a design specification	
18	Private study hours: preparation for an examination	
19		
20	Number of private study hours	8 <i>(total)</i>
21	Number of ECTS credits for private study hours <i>(1 ECTS credit = 25-30 hours of study time)</i>	0.32
22	Total study time	25
23	Total ECTS credits for the module <i>(1 ECTS credit = 25-30 hours of study time)</i>	1
24	Number of practice-based hours <i>Total practice-based hours</i>	0
25	Number of ECTS credits for practice-based hours <i>(1 ECTS credit = 25-30 hours of study time)</i>	0

E. READING LIST

References	
Module website	