



### MODULE SPECIFICATION

Module code	
Module title in Polish	<b>Mechanika i wytrzymałość materiałów 1</b>
Module title in English	<b>Mechanics and Strength of Materials 1</b>
Module running from the academic year	<b>2016/2017</b>

### A. MODULE IN THE CONTEXT OF THE PROGRAMME OF STUDY

Field of study	<b>Environmental Engineering</b>
Level of qualification	<b>first cycle</b> (first cycle, second cycle)
Programme type	<b>academic</b> (academic/practical)
Mode of study	<b>full-time</b> (full-time/part-time)
Specialism	All
Organisational unit responsible for module delivery	<b>The Department of Strength of Materials and Concrete Structures</b>
Module co-ordinator	<b>Prof. Wiesław Trąpczyński, PhD hab., Eng.</b>
Approved by:	<b>Prof. Wiesław Trąpczyński, PhD hab., Eng.</b>

### B. MODULE OVERVIEW

Module type	<b>core module</b> (core/programme-specific/elective HES*)
Module status	<b>compulsory module</b> (compulsory/optional)
Language of module delivery	<b>Polish/English</b>
Semester in the programme of study in which the module is taught	semester 2
Semester in the academic year in which the module is taught	summer semester (winter semester/summer semester)
Pre-requisites	<b>None</b> (module code/module title, where appropriate)
Examination required	<b>No</b> (Yes/No)
ECTS credits	

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

<b>Mode of instruction</b>	<b>lectures</b>	<b>classes</b>	<b>laboratories</b>	<b>project</b>	<b>others</b>
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# Politechnika Świętokrzyska

## WYDZIAŁ INŻYNIERII ŚRODOWISKA, GEOMATYKI I ENERGETYKI

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

<b>Module aims</b>	The aim of the module is to familiarise students with basic calculation tools concerning construction engineering as well as calculations facilitating determining the reaction of solids, simple and complex beams as well as statically determinable frames for simple loads, geometrical characteristics of a section as well as the analysis of stresses for simple cases of bending beams.
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Module outcome code	Module learning outcomes	Mode of instruction (l/c/lab/p/ others)her)	Corresponding programme outcome code	Corresponding discipline-specific outcome code
W_01	A student has basic knowledge concerning statistics.	l/c	IS_W14	T1A_W02 T1A_W06
W_02	A student has fundamental knowledge as regards determining reactions and internal forces in simple beam elements and frames.	l/c	IS_W14	T1A_W02 T1A_W06
W_03	A student has basic knowledge as regards calculating simple beams in terms of bending.	l/c	IS_W14	T1A_W02 T1A_W06
U_01	A student can make force reduction to a pole.	l/c	IS_U14	T1A_U03 T1A_U07 T1A_U08
U_02	A student is able to determine reactions and internal forces in simple beam elements and frames.	l/c	IS_U14	T1A_U03 T1A_U07 T1A_U08
U_03	A student can determine geometrical characteristics of sections, static and inertia moment, transformational patterns, main central axes and main central inertia moments for simple figures.	l/c	IS_U14 IS_U03	T1A_U02 T1A_U03 T1A_U07 T1A_U08
U_04	A student is capable of determining normal and static stresses for bending simple beams.	l/c	IS_U14	T1A_U03 T1A_U07 T1A_U08
K_01	A student can work individually.	c	IS_K01	T1A_K03
K_02	A student is responsible for the reliability of the obtained results.	c	IS_K02	T1A_K05

#### Module content:

1. Topics to be covered in the lectures

No.	Topics	Module outcome code
1-2	The concept of a force and moment. The elements of a vector calculus. Reduction of forces to a pole in a plane system.	W_01 U_01
3-6	Equilibrium conditions of a system of forces, the types of structure bonds, calculating reactions for various types of simple loads for simple structure elements (e.g. beams and frames).	W_01 W_02 U_02
6-8	Internal forces, examining the function of internal forces, preparing diagrams of internal forces for simple structure elements (e.g. beams and frames).	W_02 W_03 U_02
9-13	Geometrical section characteristics, static and inertia moments, transformation patterns, main central axes and main central inertia moments of simple figures.	W_01 W_03 U_03
14-15	Normal stresses in stretched (tension) rods. Normal and static stresses for	W_03



simple bending of beams.	U_04
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### 2. Topics to be covered in the classes

No.	Topics	Module outcome code
1-2	The elements of a vector calculus. The reduction of a system of forces to a pole in a plane system.	W_01 U_01 K_01 K_02
3-4	Calculating support reactions in simple and articulated beams.	W_01 U_02 K_01 K_02
5-6	Calculating support reactions in simple and articulated beams.	W_01 U_02 K_01 K_02
7-8	Preparing the diagrams of internal forces in simple and continuous articulated beams.	W_02 U_02 K_01 K_02
9-10	Preparing the diagrams of internal forces in simple and continuous articulated beams.	W_02 U_02
11-13	Determining geometrical characteristics, static and inertia moments, main central axes and main central inertia moments of simple figures.	W_01 U_03 K_01 K_02
14-15	Calculating normal and static stresses for simple beam bending.	W_03 U_04 K_01 K_02

### 3. Topics to be covered in the laboratories

#### 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	An examination and a test
W_02	An examination and a test
W_03	An examination and a test
U_01	An examination and a test
U_02	An examination
U_03	An examination and a test
U_04	An examination and a test
K_01	An examination and a test
K_02	An examination and a test



# Politechnika Świętokrzyska

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**WYDZIAŁ INŻYNIERII ŚRODOWISKA, GEOMATYKI I ENERGETYKI**



### 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	15
3	Contact hours: participation in laboratories	
4	Contact hours: attendance at office hours (2-3 appointments per semester)	6
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	<b>Number of contact hours</b>	<b>36</b> <i>(total)</i>
10	<b>Number of ECTS credits for contact hours</b> <i>(1 ECTS credit = 25-30 hours of study time)</i>	<b>1,44</b>
11	Private study hours: background reading for lectures	9
12	Private study hours: preparation for classes	14
13	Private study hours: preparation for tests	14
14	Private study hours: preparation for laboratories	
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	<b>Number of private study hours</b>	<b>37</b> <i>(total)</i>
21	<b>Number of ECTS credits for private study hours</b> <i>(1 ECTS credit = 25-30 hours of study time)</i>	<b>1,48</b>
22	<b>Total study time</b>	<b>75</b>
23	<b>Total ECTS credits for the module</b> <i>(1 ECTS credit = 25-30 hours of study time)</i>	<b>3</b>
24	<b>Number of practice-based hours</b> <i>Total practice-based hours</i>	
25	<b>Number of ECTS credits for practice-based hours</b> <i>(1 ECTS credit = 25-30 hours of study time)</i>	

### E. READING LIST

References	
Module website	