MODULE DESCRIPTION

Module code	**Z-ZIP-407z**
Module name	**Laboratorium wytrzymałości materiałów**
Module name in English	**Materials Strength – Laboratory**
Valid from academic year	**2016/2017**

A. MODULE PLACEMENT IN THE SYLLABUS

Field of study	**Management and Production Engineering**
Level of education	**1st degree** *(1st degree / 2nd degree)*
Studies profile	**General** *(general / practical)*
Form and method of conducting classes	**Full-time** *(full-time / part-time)*
Specialisation	**All**
Unit conducting the module	**Department of Applied Computer Science and Applied Mathematics**
Module co-ordinator	**Jan Lachowski, PhD**
Approved by:	

B. MODULE OVERVIEW

Type of subject/group of subjects	**Major** *(basic / major / specialist subject / conjoint / other HES)*
Module status	**Compulsory** *(compulsory / non-compulsory)*
Language of conducting classes	**English**
Module placement in the syllabus - semester	**5th Semester**
Subject realisation in the academic year	**Winter semester** *(winter semester/ summer)*
Initial requirements	**Mechanics for Engineers** *(module codes / module names)*
Examination	**No** *(yes / no)*
Number of ECTS credit points	**1**

Method of conducting classes	Lecture	Classes	Laboratory	Project	Other
Per semester			**15**		

C. TEACHING RESULTS AND THE METHODS OF ASSESSING TEACHING RESULTS

Module target	The aim of the module is to acquire practical skills of applying finite elements to construct and analyse models for materials strength.

Effect symbol	Teaching results	Teaching methods *(l/c/lab/p/other)*	Reference to subject effects	Reference to effects of a field of study
W_01	A student has knowledge as regards creating and analysing engineering projects using programs of the finite elements method.	l	K_W06	T1A_W04
U_01	A student is able to utilise the learnt mathematical methods and computer simulations in the process of analysing and assessing manufacturing decisions.	l	K_U14	TA1_U07 TA1_U08 TA1_U09
K_01	A student understands the necessity and knows the possibilities of continuous self-betterment, which leads to raising his/her professional and personal competences.	l	K_K01	T1A_K01

Teaching contents:

1. Teaching contents as regards lectures

Lecture number	Teaching contents	Reference to teaching results for a module

2. Teaching contents as regards classes

Class number	Teaching contents	Reference to teaching results for a module

3. Teaching contents as regards laboratory classes

Laboratory class number	Teaching contents	Reference to teaching results for a module
1	Introduction to the ABAQUS system. The examples of preparing data and interpreting results.	K_01
2	Illustrating the principle of solidification based on a simple example of a bended beam.	W_01 U_01
3	Numerical confirmation of de SaintVenant's Principle.	W_01 U_01
4	Numerical verification of the principle of Bernoulli's flat cross-sections.	W_01 U_01
5	Solving tasks concerning materials strength for an elastic as well as elastic-plastic material model. Construction loading and lightening.	W_01 U_01
6	Elastic buckling of a straight rod. Imperfection analysis.	W_01

		U_01
7	Concentration of stresses in an elastic disk.	W_01 U_01
8	An individual test. Obtaining a credit.	W_01

4. The characteristics of project assignments

The methods of assessing teaching results

Effect symbol	**Methods of assessing teaching results** *(assessment method, including skills – reference to a particular project, laboratory assignments, etc.)*
W_01	Doing laboratory exercises, a final test.
U_01	Doing laboratory exercises, a final test.
K_01	General knowledge of engineering designing and modelling programs; a discussion.

D. STUDENT'S INPUT

ECTS credit points		
	Type of student's activity	**Student's workload**
1	Participation in lectures	
2	Participation in classes	
3	Participation in laboratories	**15**
4	Participation in tutorials (2-3 times per semester)	
5	Participation in project classes	
6	Project tutorials	
7	Participation in an examination	
8		
9	**Number of hours requiring a lecturer's assistance**	**15** *(sum)*
10	**Number of ECTS credit points which are allocated for assisted work** *(1 ECTS point=25-30 hours)*	**0.6**
11	Unassisted study of lecture subjects	
12	Unassisted preparation for classes	
13	Unassisted preparation for tests	
14	Unassisted preparation for laboratories	**6**
15	Preparing reports	
15	Preparing for a final laboratory test	**4**
17	Preparing a project or documentation	
18	Preparing for an examination	
19		
20	**Number of hours of a student's unassisted work**	**10** *(sum)*
21	**Number of ECTS credit points which a student receives for unassisted work** *(1 ECTS point=25-30 hours)*	**0.4**
22	**Total number of hours of a student's work**	**25**
23	**ECTS points per module** *1 ECTS point=25-30 hours*	**1**
24	**Work input connected with practical classes** *Total number of hours connected with practical classes*	**25**
25	**Number of ECTS credit points which a student receives for practical classes** (1 ECTS point=25-30 hours)	**1**

E. LITERATURE

Literature list	1. Bojczuk M., Duda I., *Wytrzymałość materiałów: Teoria i przykłady obliczeń*, Politechnika Świętokrzyska, Skrypt nr 331, Kielce 1998. 2. Piechnik S., *Wytrzymałość materiałów*, PWN, Warszawa 1980. 3. Getting Started with ABAQUS. 4. Niezgodziński M.E., Niezgodziński T., *Wzory, Wykresy i Tablice wytrzymałościowe, WNT*, Warszawa 1996.
Module website	http://kis.tu.kielce.pl