

MODULE DESCRIPTION

Module code	Z-ZIP2-0544
Module name	Elementy projektowania inżynierskiego
Module name in English	Elements of Engineering Design
Valid from academic year	2016/2017

A. MODULE PLACEMENT IN THE SYLLABUS

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

B. MODULE OVERVIEW

Type of subject/group of subjects	Basic <i>(basic / major / specialist subject / conjoint / other HES)</i>
Module status	Compulsory <i>(compulsory / non-compulsory)</i>
Language of conducting classes	English
Module placement in the syllabus - semester	1st semester
Subject realisation in the academic year	Summer semester <i>(winter semester/ summer)</i>
Initial requirements	No requirements <i>(module codes / module names)</i>
Examination	No <i>(yes / no)</i>
Number of ECTS credit points	2

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

C. TEACHING RESULTS AND THE METHODS OF ASSESSING TEACHING RESULTS

Module target	The aim of the module is to broaden knowledge about the engineering design using computer methods. Special attention was paid to the issue of the application of systems engineering.
----------------------	---

Effect symbol	Teaching results	Teaching methods (l/c/l/p/other)	Reference to subject effects	Reference to effects of a field of study
W_01	A student has a general knowledge as regards the design process: formulating of project task, analysing of project task, searching for solutions of project task and for making documentation of solution of design task.	l/lab	K_W02	T2A_W01 T2A_W02
U_01	Ability in organization of work for the project team, determining the optimal structure of design and the use of appropriate design methods. Student can evaluate team members.	l/lab	K_U03 K_U04 K_U06 K_U13	T2A_U03 T2A_U07 T2A_U08 T2A_U10 T2A_U15 T2A_U17 S2A_U06
K_01	A student understands the necessity of improving his/her knowledge continuously. Student takes into account the psychological and social factors leading a team	l/lab	K_K03	T2A_K03 T2A_K05 T2A_K07

Teaching contents:

1. Teaching contents as regards lectures

Laboratory class number	Teaching contents	Reference to teaching results for a module
1	Example of engineering design, designing elements of mechanical system.	W_01 K_01
2	Computer aided engineering design, algorithm of numerical analysis of the mechanical system.	W_01 K_01
3	Examples of formulation of mathematical models.	W_01 K_01
4	Model of computer analysis of the mechanical structure, finite element method basics, examples.	W_01 K_01
5	Systems engineering design. System environment, the application of systems engineering in the design.	W_01 K_01
6	Design process: essence and structure. Activities in the design process.	W_01 K_01
7-8	Computer-aided design. Testing and evaluation of design solutions, computer aided decision, creating documentation.	W_01 K_01

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 computer-aided calculations system.	U_01
2-3	Computer models for bar and beam structures, static analysis, designing the cross-section.	U_01
4-5	Computer models for bar and beam structures, eigenvalue analysis, dynamic analysis.	U_01
6-7	Computer models for physically and geometrically nonlinear analysis.	U_01
8	Discussion on the effectiveness of modelling methods.	U_01

4. The characteristics of project assignments

The methods of assessing teaching results

Effect symbol	Methods of assessing teaching results <i>(assessment method, including skills – reference to a particular project, laboratory assignments, etc.)</i>
W_01	A multiple choice final test.
U_01	Active participation and a discussion in the classes.
K_01	Active participation and a discussion in the classes.

D. STUDENT'S INPUT

ECTS credit points		
	Type of student's activity	Student's workload
1	Participation in lectures	15
2	Participation in classes	
3	Participation in laboratories	15
4	Participation in tutorials (2-3 times per semester)	3
5	Participation in project classes	
6	Project tutorials	
7	Participation in an examination	
8	Participation in a test	2
9	Number of hours requiring a lecturer's assistance	35 <i>(sum)</i>
10	Number of ECTS credit points which are allocated for assisted work <i>(1 ECTS point=25-30 hours)</i>	1.2
11	Unassisted study of lecture subjects	7
12	Unassisted preparation for classes	
13	Unassisted preparation for tests	
14	Unassisted preparation for laboratories	7
15	Preparing reports	4
15	Preparing for a final laboratory test	7
17	Preparing a project or documentation	
18	Preparing for an examination	
19		
20	Number of hours of a student's unassisted work	25 <i>(sum)</i>
21	Number of ECTS credit points which a student receives for unassisted work <i>(1 ECTS point=25-30 hours)</i>	0.8
22	Total number of hours of a student's work	60
23	ECTS points per module <i>1 ECTS point=25-30 hours</i>	2
24	Work input connected with practical classes <i>Total number of hours connected with practical classes</i>	28
25	Number of ECTS credit points which a student receives for practical classes <i>(1 ECTS point=25-30 hours)</i>	0.9

E. LITERATURE

Literature list	<ol style="list-style-type: none"> 1. Gąsiorek E., <i>Podstawy projektowania inżynierskiego</i>, Podręcznik Akademii Ekonomicznej, Wrocław 2006. 2. Cichoń C., <i>Metody obliczeniowe</i>, Podręcznik Politechniki Świętokrzyskiej, Kielce 2005. 3. Rakowski G., Kacprzyk Z., <i>Metoda elementów skończonych w mechanice konstrukcji</i>, Wydawnictwo Politechniki Warszawskiej, Warszawa 1993. 4. Hurst K., <i>Engineering Design Principles</i>. Arnold Publishers, 1999. 5. Jankowscy M. i J., <i>Przegląd metod i algorytmów numerycznych</i>, cz. 1, cz. 2. WNT, Warszawa 1988.
Module website	kis.tu.kielce.pl