MODULE DESCRIPTION

Module code	
Module name	**Wizualizacja komputerowa w projektowaniu inżynierskim**
Module name in English	**Computer Visualization in 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** *(1st degree / 2nd degree)*
Studies profile	**General** *(general / practical)*
Form and method of conducting classes	**Full-time** *(full-time / part-time)*
Specialisation	**Supply Chain Management**
Unit conducting the module	**The Department of Production Engineering**
Module co-ordinator	**Artur Szmidt, PhD**
Approved by:	

B. MODULE OVERVIEW

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

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 acquisition of practical knowledge in the field of engineering design capabilities of modern engineering design applications, and in particular the conduct of analyzes and simulation (FEM) designed object, visualization, motion assemblies (Motion), internal and external flows (FlowSymulation) off designed object.

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	The student has knowledge on how to create drawings of parts and assemblies of technical equipment. He has knowledge of the behavior of individual components during operation and knows all the laws of motion and can describe them.	l	K_W01 K_W02 K_W06	T2A_W01 T2A_W02 InzA_W02
W_02	The student has knowledge of stress and displacement and deformations of loaded forces, torques, the device is able to efficiently analyze the phenomena occurring during computer simulation.	l	K_W02 K_W06 K_W07	T2A_W01 T2A_W02 T2A_W06 InzA_W02
W_03	The student has knowledge of the flow of air and liquids in confined spaces and the distribution of physical quantities on the surface surrounded by the media.	l	K_W01 K_W06 K_W07	T2A_W01 T2A_W02 T2A_W06 InzA_W02
U_01	Student knows how to create parts in the engineering program. Can prepare parts, do assemble a device and then simulate the complex motion of the device.	l	K_U01 K_U04 K_U07	TA2_U01 InzA_U01 InzA_U05
U_02	The student knows how to simulate FEM using known engineering programs. He can evaluate the results and reports generated by engineering design.	l	K_U01 K_U04 K_U07	TA2_U01 InzA_U01 InzA_U05
U_03	The student knows how to simulate the flow of liquid or gas through a closed vessel, and the gas flow during the movement of vehicles.	l	K_U01 K_U04 K_U07	TA2_U01 InzA_U01 InzA_U05
K_01	The student is aware of methods to analyze the movement of the apparatus is able to analyze the results obtained.	l	K_K01	InzA_K02
K_02	The student understands the need to have the skills to carry out FEM simulation during the design of the structure.	l	K_K01	InzA_K02
K_03	The student is able to determine the friction force, pressure, velocity, etc. in the course of flow through the device.	l	K_K01	InzA_K02

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	Management of parts in SolidWorks - assembly. Rules of standard, advanced and mechanical conds. Immobilization of selected parts geometry reference deposit.	W_01 W_02 U_01 U_02 K_01 K_02
2	Motion study of designed assembly. The choice of the driven element, drive type, direction, and the value of the assumed "drive". Setting the properties "of the basic movement." Animation of kinematics motion and analysis of the results, creating charts and graphs of the analyzed traffic.	W_01 U_01 K_01
3	Motion study of designed deposit - cont. Motion dynamics of designed device.	W_01 U_01 K_01
4	Strength analysis of test member. Connection, fixing and the load of selected structural elements. Meshing - details and characteristics of the grid. Simulation and "animation" of loaded device. Interpretation of results.	W_02 U_02 K_02
5	Strength analysis of test member - continued. Optimization of shapes and FEM simulations. The selection of optimum material for designed parts.	W_02 U_02 K_02
6	Analysis of the flow of fluid through the closed sections, interpretation of results.	W_03 U_03 K_03
7	Analysis of flow during the movement of elements in the environment of liquids and gases. Interpretation of results. Optimizing the surface during the analysis.	W_03 U_03 K_03
8	Getting the credit for laboratory.	

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	Execution of the complete assembly of the device and performing the proper modion analysis.
W_02	Execution of correct simulation of FEM.
W_03	Performing proper analysis of Flow Simulation.
U_01	Execution of the complete assembly of the device and performing the proper motion analysis.
U_02	Execution of correct simulation of FEM.
U_03	Performing proper analysis of Flow Simulation.
K_01	Execution of the complete assembly of the device and performing the proper motion analysis.
K_02	Execution of correct simulation of FEM.
K_03	Performing proper analysis Flow Simulation.

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	**10**
7	Participation in an examination	
8		
9	**Number of hours requiring a lecturer's assistance**	**25** *(sum)*
10	**Number of ECTS credit points which are allocated for assisted work** *(1 ECTS point=25-30 hours)*	**1**
11	Unassisted study of lecture subjects	
12	Unassisted preparation for classes	
13	Unassisted preparation for tests	
14	Unassisted preparation for laboratories	**10**
15	Preparing reports	
15	Preparing for a final laboratory test	
17	Preparing a project or documentation	**15**
18	Preparing for an examination	
19		
20	**Number of hours of a student's unassisted work**	**25** *(sum)*
21	**Number of ECTS credit points which a student receives for unassisted work** *(1 ECTS point=25-30 hours)*	**1**
22	**Total number of hours of a student's work**	**50**
23	**ECTS points per module** *1 ECTS point=25-30 hours*	**2**
24	**Work input connected with practical classes** *Total number of hours connected with practical classes*	**50**
25	**Number of ECTS credit points which a student receives for practical classes** (1 ECTS point=25-30 hours)	**2**

E. LITERATURE

Literature list	1. … 2. … 3. … 4. ...
Module website	www.designews.pl www.konstrukcjeinzynierskie.pl www.cns.pl www.cad.pl www.3Dcad.pl www.cadblog.pl

	www.pswug.pl www.solidexpert.com