MODULE DESCRIPTION

Module code	**Z-ZIP2-594z**
Module name	**Maszyny przepływowe w zakładach produkcyjnych**
Module name in English	**Flow Machines in Industry**
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	**Management Engineering**
Unit conducting the module	**Department of Production Engineering**
Module co-ordinator	**Artur Bartosik, PhD hab., Eng., Professor of the University**
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 theoretical knowledge on construction and application of modern machines for the transport of liquids and gases and the phenomena accompanying the movement of the fluid in these machines.

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	Student has knowledge about flow-through fluid-flow machinery and is familiar with the phenomenon of the fluid movement in machinery.	l	K_W01	T2A_W01 T2A_W02
W_02	Student has a basic knowledge about the nominal parameters characterized fluid-flow machinery and know an elementary construction of these machines.	l	K_W01	T2A_W01 T2A_W02
W_03	Student has a basic knowledge on the experimental and theoretical determination of a pipeline characteristics and knows rules of choosing proper fluid-flow machinery to required liquid flow.	l	K_W11	T2A_W05
U_01	Student knows how to obtain information from literature, databases on fluid-flow machinery for their suitability for a particular application.	l	K_U01	T2A_U01
K_01	Student understand the need for lifelong learning in order to raise his/her professional qualifications from the scope of fluid mechanics.	l	K_K01	T2A_K01 T2A_K06

Teaching contents:

1. Teaching contents as regards lectures

Lecture number	Teaching contents	Reference to teaching results for a module
1	Division of flow machines and physical phenomena accompanying the movement of the fluid in the machines.	W_01
2	Nominal parameters characterizing fluid-flow machinery.	W_02 U_01
3	Construction of fluid-flow machinery.	W_02 U_01
4	The methodology of development of fluid-flow machinery characteristics working sequentially and parallel.	W_03
5	The methodology of choosing fluid-flow machinery for a specific flow.	W_03 U_01 K_01 K_02
6	Students excursion to pump factory near the Kielce.	W_02 U_01 K_01
7	Exam.	

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

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	**Exam.** Student to get a good assessment should have a basic knowledge about flow-through machines used in industry. To get a very good assessment, the student should additionally know, understand and describe mathematically the phenomena which accompany the flow of fluid.
W_02	**Exam.** Student to get a good assessment should have a basic understanding on the nominal parameters characterized fluid-flow machinery and know an elementary construction of these machines. To get a very good assessment, the student should additionaly be familiar with the method of the experimental development of characteristics of fluid-flow machinery.
W_03	**Exam.** Student to get a good assessment should have a basic knowledge on the experimental and theoretical determination of the characteristics of the pipeline flow. To get a very good assessment, the student should additionaly be familiar with the method of development of fluid-flow machinery characteristics and knows trends in machinery development.
U_01	**Exam.** Student to get a good assessment should be able to use the basic theoretical knowledge acquired in lectures and of databases and literature to analyze requirements of fluid-flow machinery for a particular application. To get a very good assessment, the student should additionally be able to justify the choice of using fluid-flow machinery to specific needs.
K_01	**Observations and discussions during the lectures.** Student to get a good assessment should understand the need for continuous replenishment of knowledge on fluid-flow machinery and keep her complement. To get a very good assessment should demonstrate knowledge of proper sources of information.

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	
4	Participation in tutorials (2-3 times per semester)	**5**
5	Participation in project classes	
6	Project tutorials	
7	Participation in an examination	
8		
9	**Number of hours requiring a lecturer's assistance**	**20** *(sum)*
10	**Number of ECTS credit points which are allocated for assisted work** *(1 ECTS point=25-30 hours)*	**0.8**
11	Unassisted study of lecture subjects	**15**
12	Unassisted preparation for classes	
13	Unassisted preparation for tests	**15**
14	Unassisted preparation for laboratories	
15	Preparing reports	
15	Preparing for a final laboratory test	
17	Preparing a project or documentation	
18	Preparing for an examination	
19		
20	**Number of hours of a student's unassisted work**	**30** *(sum)*
21	**Number of ECTS credit points which a student receives for unassisted work** *(1 ECTS point=25-30 hours)*	**1.2**
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*	**20**
25	**Number of ECTS credit points which a student receives for practical classes** (1 ECTS point=25-30 hours)	**0.8**

E. LITERATURE

Literature list	1. Shook C.A., Roco M.C., *Slurry flow: principle and practice*, Butterworth-Heineman, Boston 1991. 2. Wilson K.C., Addie G.R., Sellgren A., Clift R., *Slurry transport using centrifugal pumps*, 3rd Edition, Springer-Verlag 2006.
Module website	