

MODULE DESCRIPTION

Module code	Z-ZIP2-0401
Module name	Eksploatacja maszyn produkcyjnych
Module name in English	Maintenance of Production Machines
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	Chair of Operation Engineering and Industrial Laser Systems
Module co-ordinator	Piotr Sęk, 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 course is to acquaint students with the basic issues of life and in particular with issues such as aging and anti-aging through the use, exploitation strategies machinery manufacturing, quality and reliability, and methods of evaluation and development of the various phases of the existence of the machines.
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Effect symbol	Teaching results	Teaching methods (l/lab/p/other)	Reference to subject effects	Reference to effects of a field of study
W_01	He has in-depth knowledge of the life cycle of the machine in connection with issues of life and the impact of maintenance and exploitation strategy on the process of aging.	l/lab	K_W02	T2A_W01 T2A_W02
W_02	He has knowledge of the impact of the technical condition of the machine on the quality and reliability and methods of formation in different phases of the existence of the machine.	l/lab	K_W05	T2A_W07 T2A_W06 T2A_W09
U_01	Can effectively obtain information from literature and other sources, is able to analyze and interpret the phenomena occurring in the operation of the technical objects is able to analyze the state of technical objects.	l/lab	K_U01	T2A_U01
U_02	It is capable of learning process in order to solve new tasks and improve skills in the use of production machines.	l/lab	K_U07	T2A_U05 T2A_U09
K_01	Appreciates the importance of the process of continuous improvement of their professional skills in the use of production machines.	l/lab	K_K01	T2A_K01 T2A_K06
K_02	He is aware of the role of a graduate of a technical university as the person responsible for the work of his own and in a group, can act ethically within the designated organizational roles.	l	K_K03	T2A_K03 T2A_K05 T2A_K07

Teaching contents:

1. Teaching contents as regards lectures

Lecture number	Teaching contents	Reference to teaching results for a module
1	Basic issues of the operation of machinery and equipment.	W_01 U_01 K_01
2	Aging and wear of machine parts - elementary and technical processes consumables.	W_01 U_01 U_02 K_02
3	The operation of equipment and machinery - Repair cycles.	W_01 U_01 U_02 K_02
4	Lubrication - Basic theory of lubrication, types of lubrication, lubrication methods.	W_01 U_01 U_02 K_01
5	Properties of lubricants - characteristics of the lubricant liquids, plastic and	W_02

	solid - selection of lubricants.	U_01 U_02 K_01
6	Basic concepts of reliability theory - characteristics of reliability of technical objects - methods of shaping and reliability assessment.	W_02 U_01 U_02 K_01
7	Management of operation machines.	W_02 U_01 U_02 K_01
8	Final test.	

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	Identification of technical wear cases.	W_01 U_01 K_01
2	Evaluation of resistance to abrasion ratio - laboratory tests.	W_01 U_01 U_02 K_02
3	Selection of the materials for a pair of friction - laboratory tests.	W_0 U_01 U_02 K_01
4	The comparative assessment of the properties of lubricants.	W_02 U_01 U_02 K_02
5	The surface properties of machine parts - evaluation of surface roughness, hardness and thickness of the layers of the reinforced.	W_02 U_02 K_02
6	Measuring the shape of various surfaces on the PG-200 machine to estimate the loss of volume of the sample tested for abrasion resistance.	W_02 U_02 K_02

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	Final test. Student to get a good mark, you should know the basic concepts of operation and the

	processes occurring in all phases of the existence of a technical object. To get a very good grade should also understand the importance of the use of machines in the economy as well as to understand the relationship between the service and the state of the machine.
W_02	Final test. Student to get a good mark, should know the impact of reliability and technical condition of the machine on the quality of the product. To get a very good grade should additionally understand the importance of reliability for safety and manufacturing quality.
U_01	Final test. Student to get a good evaluation should be able to use the theoretical knowledge gained in lectures to solve engineering problems related to the operation. To get a very good student should also be able to make their own analysis of the presented solutions.
U_02	Final test. Student to get a good evaluation should be able to use the theoretical knowledge gained in lectures to present proposals for actions affecting the reliability of the specified technical object. To get a very good student should also be able to make their own analysis of the proposals.
K_01	Observation of attitude the student during classes. Student to get a good evaluation should understand the need for continuous replenishment of knowledge in the field of machine reliability. To get a very good, should complement the knowledge of a wider range of group members.
K_02	Observation of attitude the student during classes. Student to get a good evaluation should understand the need for continuous replenishment of knowledge in the field of machine reliability. To get a very good, should complement the knowledge of a wider range of group members.

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)	2
5	Participation in project classes	
6	Project tutorials	
7	Participation in an examination	
8		
9	Number of hours requiring a lecturer's assistance	32 <i>(sum)</i>
10	Number of ECTS credit points which are allocated for assisted work <i>(1 ECTS point=25-30 hours)</i>	1.0
11	Unassisted study of lecture subjects	15
12	Unassisted preparation for classes	
13	Unassisted preparation for tests	5
14	Unassisted preparation for laboratories	5
15	Preparing reports	5
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 <i>(sum)</i>
21	Number of ECTS credit points which a student receives for unassisted work <i>(1 ECTS point=25-30 hours)</i>	1.0
22	Total number of hours of a student's work	62
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>	30
25	Number of ECTS credit points which a student receives for practical classes <i>(1 ECTS point=25-30 hours)</i>	0.97

E. LITERATURE

Literature list	<ol style="list-style-type: none"> 1. Lindley R. Higgins R., Keith M., Darrin W., <i>Maintenance Engineering Handbook</i>, Seventh Edition. 2. Williams J.H., Davies A., Drake P.R., <i>Condition-based Maintenance and Machine Diagnostics</i>. 3. Brumbach M.E., Clade J.A., <i>Industrial Maintenance</i>.
Module website	