

(faculty stamp)

COURSE DESCRIPTION

Z1-PU7

WYDANIE N1

Strona 1 z 2

1. Course title: Fundamentals of Machinery Design		2. Course code		
3. Validity of course description: 2012/2013				
4. Level of studies: 1 st cycle of higher education				
5. Mode of studies: intramural studies				
6. Field of study: POWER Engineering		(FACULTY SYMBOL)		
7. Profile of studies: academic				
8. Programme: Sustainable Energy Engineering				
9. Semester: 3				
10. Faculty teaching the course: Faculty of Energy and Environmental Engineering				
11. Course instructor: Wojciech Kosman				
12. Course classification: expert course (przedmiot kierunkowy)				
13. Course status: compulsory				
14. Language of instruction: English				
15. Pre-requisite qualifications: technical mechanics, technical drawing				
16. Course objectives:				
Learn the principles of machine design through the study of the structure and operation of the basic components. Develop the ability to design mechanical parts and perform their strength analysis.				
17. Description of learning outcomes:				
Nr	Learning outcomes description	Method of assessment	Teaching methods	Learning outcomes reference code
1.	Knowledge of the principles of a design process.	test	lecture	K_U15 K_U18
2.	Understanding of the operation of typical parts of mechanical machines.	test	lecture	K_W10
3.	Ability to perform strength analysis of typical components of machines.	test	lecture	K_U15 K_U18
4.	Ability to select typical parts for designed machines.	projects completion	project	K_W10 K_U15 K_U18
5.	Ability to prepare the description of the designed part.	projects completion	project	K_W07 K_U02
6.	Knowledge of the basic standards and codes that apply to the design of mechanical machines.	projects completion	project	K_W10 K_U18
18. Teaching modes and hours				
Lecture 30 / BA /MA Seminar / Class / Project 30 / Laboratory				
19. Syllabus description:				
<u>Lecture:</u>				
Principles of machine design				
<ul style="list-style-type: none"> The design process. description of a design. Assessment of a design - criteria. Engineering tolerance. Interference fit. Surface roughness. 				
Principles of the strength analysis				
<ul style="list-style-type: none"> Types of external loads. Safety numbers. The influence of the components shape on the strength state under varying load. 				
Joints of machine parts				
<ul style="list-style-type: none"> Threads. Friction force in a thread. Loads in a thread. Strength analysis of a thread. Types of screws and nuts. Welded joints. Types of welded joints. Strength analysis of the butt and fillet weldings. Key joints. Spline joints. 				
Bearings				
<ul style="list-style-type: none"> Plain bearings. Rolling bearings. Types of bearings. Interference fits in bearings. Loads and durability of bearings. The selection of bearings. 				
Machine shafts				
<ul style="list-style-type: none"> Design of machine shafts. Strength analysis. Assembly of various components on machine shafts. 				

Project:

- Machine shaft design.
 - Selection of bearings for a machine shaft.
- Pressure vessel design.

20. Examination: no

21. Primary sources:

- R. C. Juvinall., K. M. Marshek „Fundamentals of Machine Component Design” Wiley Book Company, 2006
- M. F. Spotts, T. E. Shoup, L.E. Hornberger „Design of Machine Elements” Pearson Prentice Hall, 2004
- Antoni Skoć, Jacek Spalek, Sylwester Markusik „Podstawy konstrukcji maszyn”, tom 1 i 2, WNT
- Eugeniusz Mazanek, Ludwik Kania, Andrzej Kasprzycki, Andrzej Dziurski „Przykłady obliczeń z podstaw konstrukcji maszyn”, tom 1 i 2, WNT

22. Secondary sources:

- Andrzej Rutkowski „Części maszyn”, Wydawnictwa Szkolne i Pedagogiczne
- Andrzej Rutkowski, Anna Sępniewska „Zbiór zadań z części maszyn”, Wydawnictwa Szkolne i Pedagogiczne

23. Total workload required to achieve learning outcomes

Lp.	Teaching mode :	Contact hours / Student workload hours
1	Lecture	30 / 30
2	Classes	/
3	Laboratory	/
4	Project	30 / 30
5	BA/ MA Seminar	/
6	Other	/
	Total number of hours	60 / 60

24. Total hours: 120

25. Number of ECTS credits: 4

26. Number of ECTS credits allocated for contact hours: 2

27. Number of ECTS credits allocated for in-practice hours (laboratory classes, projects): 2

26. Comments:

Approved:

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(date, Instructor's signature)

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(date, the Director of the Faculty Unit signature)