COURSE GUIDE

Subject name	**THEORY OF MACHINES**
Course of study	**Quality & Production Management**
The form of study	**Full-time**
Level of qualification	**I**
Year	**II**
Semester	**IV**
The implementing entity	**Department of Production Engineering and Safety**
The person responsible for preparing	**Dr hab. inż. Robert Ulewicz, prof. PCz**
Profile	**General academic**
Course type	**elective**
ECTS points	**4**

TEACHNING METHODS – NUMBER OF HOURS PER SEMESTER

LECTURE	CLASS	LABORATORY	PROJECT	SEMINAR
15E	**15**		**15**	

COURSE AIMS

C1. Understanding the classification of machines and devices, solutions used in selected industries
C2. Understanding the principles of selecting machines and devices, including, for example, performance, operating costs, service, inspections, etc.

ENTRY REQUIREMENTS FOR KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Basic knowledge of the course of production processes.
2. Knowledge about the functioning of the economy.
3. The ability to carry out mathematical calculations.

LEARNING OUTCOMES

EK 1- Has basic knowledge about the classification of machinery and equipment
EK 2 - Can describe the basic principles of machinery and equipment
EK 3 - Has the ability to synthesize and use knowledge from various areas in order to optimally select the machine for a given production system.

COURSE CONTENT

Type of teaching – LECTURES 15E HOURS	Number of hours
W 1- Definitions, division and basic parameters of machines	2
W 2- Engineering of machine systems	1
W 3- Design and construction of machines	1
W 4- Selected problems of mechanics and strength of materials	2
W 5- An overview of typical solutions of machine systems in various industries (technological machines, bearings, couplings, mechanical transmissions, lifting and transport devices, pneumatic and hydraulic motors, pumps, compressors and refrigerators, fans and blowers, combustion engines	6
W 6- The normative requirements for the use of machines	1
W 7- Diagnostics	1
W 8- Automation of technological machines	1
Type of teaching – CLASS 15 HOURS	**No. of hours**
C 1- Fundamentals of construction, manufacture and operation of machines	3
C 2- Technical drawing, projection methods, tolerances	3
C 3- Acquire information from literature, industry catalogs and Polish Standards	2
C 4 - Basic operating principles, gears, engines, pumps, etc.	2
C 5- Methods of selecting the optimal machine system (eg using the objective function), performance factors, safety, retrofitting possibilities, etc.	3
C 6- Automation and robotization of production processes	2
Type of teaching – PROJECT 15 HOURS	**No. of hours**
P1 - Selection of the appropriate machine system for the selected production process (eg sheet cutting process, the design should include transport equipment, (type, operating costs, impact on the environment, machines / cutting equipment: guillotine, laser, plasma, water, etc. advantages , watts applied unique solutions).	15

TEACHNING TOOLS

1. Books and monographs
2. Audiovisual presentation
3. calculation sheets
4. Case study

WAYS OF ASSESSMENT (F – FORMATIVE, P – SUMMATIVE)

F1. Evaluation of the implementationtasksin the classroom.
F2. Observation of students' work in the classroom.
P1. Final test.
P2. Written exam.

STUDENT WORKLOAD

Form of activity		Average number of hours for realization of the activity		
		[h]	ECTS	ECTS
Contact hours with the teacher	LECTURE	15	0.6	1.28
Preparation for exam		15	0.6	
Exam		2	0.08	
Contact hours with the teacher	CLASS	15	0.6	1.2
Preparation of the class		15	0.6	

Contact hours with the teacher	PROJECTS	11	0.44	0.88
Preparation of the projects		11	0.44	
Getting Acquainted with the indicated literature		11	0.44	0.44
Consultation		5	0.2	0.2
TOTAL NUMBER OF HOURS / ECTS POINTS FOR THE COURSE		**∑100h**	**∑ 4 ECTS**	

BASIC AND SUPPLEMENTARY RESOURCE MATERIALS

Basic resources:	
1.	Amitabha Ghosh: Theory of Mechanisms and Machines 3rd Edition. East West Press 2006.
2.	Norton R.L.:Design of machinery. An introduction to the synthesis and analysis of mechanisms and machines. Massachusetts 2010
3.	Biały W., Maszynoznawstwo, WNT, Warszawa 2004 r.
Supplementary resources:	
1.	Boris M. Klebanow, David M.Barlam, Frederic E.Nystrom: Machine elements. Life and design, CRC PressTaylor & Francis Group. London 2008.
2.	R.S. Khurmi J.K. Gupta:Textbook of Machine Design.Eurasia Publishing House (Pvt.) Ltd. Ram Nagar, New Delhi 2005.
3.	Kurmaz L.W., Podstawy konstrukcji maszyn, projektowanie, PWN, Warszawa 1999 r.

TEACHERS (NAME,SURNAME, ADRES E-MAIL)

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MATRIX OF LEARNING OUTCOMES REALISATION

Learning outcome	Reference of given outcome to outcomes defined for whole program	Course aims	Course content	Teaching tools	Ways of assessment
EK1	K_W05 K_W07 K_W09	C1	W1-W6 C1-C4	1, 2, 3, 4	P1, P2, F1, F2
EK 2	K_W05K_W06 K_W07 K_W09 K_U01 K_U02 K_U05 K_U10 K_K01	C1, C2	W1-W6 C1-C6 P1	1, 2, 3, 4	P1, P2
EK 3	K_W01 K_W05 K_W06 K_W07 K_U01 K_U02 K_U05 K_U10 K_K01	C1, C2	W1-W8 C1-C6 P1	1, 2, 3, 4	P1, P2, F1, F2

FORM OF ASSESSMENT - DETAILS

	grade 2	grade 3	grade 4	grade 5
EK1	There is no basic knowledge about the classification of machines and devices	Has selective knowledge about the classification of machines and devices	Has basic knowledge about the classification of machines and devices	Has basic knowledge about the classification of machines and devices
EK2	He can not describe the basic principles of machinery and equipment	He is able to describe some principles of the operation of machines and devices	He can describe the basic principles of the operation of machines and devices	Able to describe the basic principles of machinery and equipment, as well as present trends in the development of machines in which they are used.
EK3	It does not have the ability to synthesize and use knowledge from different areas in order to optimally select the machine for a given production system.	Has the ability to use knowledge from part of the areas in order to optimally select the machine for a given production system.	Has the ability to use knowledge from different areas in order to optimally choose the machine for a given production system.	Has the ability to synthesize and use knowledge from different areas in order to optimally select the machine for a given production system.

ADDITIONAL USEFUL INFORMATION ABOUT THE COURSE

1. Information where presentation of classes, instruction, subjects of seminars can be found, etc. - information presented to students in class, if required by the formula classes are sent electronically to the e-mail addresses of individual dean groups - information can be found on the website of the department.
2. Information about the place of classes - - information can be found on the website of the department.
3. Informationabout the timingof classes(day of the week / time)- information can be found on the website of the department.
4. Informationabout the consultation(time +place) - are given to students for the first class, can be found on the website of the department.

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Coordinator