

COURSE GUIDE

<u>Subject name</u>	Theory of machines
<u>Course of study</u>	Quality and Production Management
<u>The form of study</u>	Full-time
<u>Level of qualification</u>	First
<u>Year</u>	II
<u>Semester</u>	IV
<u>The implementing entity</u>	Department of Production Engineering and Safety
<u>The person responsible for preparing</u>	dr inż. Marek Krynke
<u>Profile</u>	General academic
<u>ECTS points</u>	4

TYPE OF TEACHING – 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

- EU1. Has basic knowledge about the classification of machinery and equipment.
- EU2. Can describe the basic principles of machinery and equipment.
- EU3. The student has the knowledge to use catalogs of standard elements and series of assemblies and subassemblies of technical means.
- EU4. 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 – LECTURE	Number of hours
W1. Definitions, division and basic parameters of machines.	2
W2. Engineering of machine systems.	1
W3. Design and construction of machines.	1
W4. Selected problems of mechanics and strength of materials.	2
W5. 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
W6. The normative requirements for the use of machines.	1
W7. Diagnostics.	1
W8. Automation of technological machines.	1
Type of teaching - CLASS	Number of hours
C1. Fundamentals of construction, manufacture and operation of machines.	3
C2. Technical drawing, projection methods, tolerances.	3

C3. Acquire information from literature, industry catalogs and Polish Standards.	2
C4. Basic operating principles, gears, engines, pumps, etc.	2
C5. Methods of selecting the optimal machine system (eg using the objective function), performance factors, safety, retrofitting possibilities, etc.	3
C6. Automation and robotization of production processes.	2
Type of teaching - PROJECT	Number 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

TEACHING 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 implementation tasks in 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	Project	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		100	4	

BASIC AND SUPPLEMENTARY RESOURCE MATERIALS

Basic resources

1. Cieśliński J.T., Barylski A. Developments in Mechanical Engineering. Vol. 3. Gdańsk, University of Technology, 2009.
2. Legutko S. Development of Mechanical Engineering as a Tool for the Enterprise Logistics Prograss. Poznan University of Technology, 2006.
3. Shigley J.W., Mitchell L.D. Mechanical Engineering Design. New York, McGraw-Hill Book Company, 1983.

Supplementary resources

1. Sempruch J., Peszyński. Developments in Machinery Design and Control. Wydaw. Akademii Techniczno-Rolniczej. Bydgoszcz 2004.
2. Browning J.E., M(a)cMann A.K. Computational Engineering Desing, Development and Applications. Nova Science Publishers. New York 2012.

3. Saga M., Vasko M., Cubonova N., Piekarska W. Optimisation Algorithms in Mechanical Engineering Applications. Pearson. Harlow 2016.
4. Radek N. Selected Problems of Mechanical Engineering and Maintenance. Wydaw. Politechniki Świętokrzyskiej, 2012.
5. Krynke M., Zasadzień M., Czaja P. Systemy techniczne – technologia, jakość, eksploatacja. Monografia. Oficyna Wydawnicza Stowarzyszenia Menedżerów Jakości i Produkcji. Częstochowa 2016. 120s.

TEACHERS (NAME, SURNAME, E-MAIL ADDRESS)

dr hab. inż. Robert Ulewicz, prof. PCz, robert.ulewicz@wz.pcz.pl

dr inż. Magdalena Mazur, magdalena.mazur@wz.pcz.pl

dr hab. inż. Dorota Klimecka-Tatar, dorota.klimecka-tatar@wz.pcz.pl

dr inż. Marek Krynke, marek.krynke@wz.pcz.pl

dr inż. Krzysztof Knop, krzysztof.knop@wz.pcz.pl

mgr inż. Krzysztof Mielczarek, krszytof.mielczarek@wz.pcz.pl

dr inż. Adam Idzikowski, adam.idzikowski@wz.pcz.pl

MATRIX OF LEARNING OUTCOMES REALISATION

Learning outcome	Reference of given outcome to outcomes defined for whole program (PRK)	Course aims	Course content	Teaching tools	Ways of assessment
EU1	K_W05, K_W07, K_W09	C1	W1-W6, C1-C4	1, 2, 3, 4	P1, P2, F1, F2
EU2	K_W05, K_W06, K_W07, K_W09, K_U01, K_U02, K_U05, K_U10, K_U11	C1, C2	W1-W6, C1-C6, P1	1, 2, 3, 4	P1, P2
EU3	K_W01, K_W05, K_W06, K_W08, K_W09, K_U01, K_U02, K_U05, K_U07, K_U08, K_U09, K_K01, K_K05	C1, C2	W3, W5, W6, C1, C3, C5, P1	1, 2, 3, 4	P1, P2, F1, F2
EU4	K_W01, K_W05, K_W06, K_W07, K_U01, K_U02, K_U05, K_U10, K_U11	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
EU1	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.
EU2	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.
EU3	The student can not use catalogs of standard elements and series of assemblies and subassemblies of	The student can use catalogs of standard elements and series of assemblies and subassemblies of	The student is able to use standard catalogs of standard elements and series of assemblies and	The student is able to use standard catalogs of standard elements and series of assemblies and subassemblies of

	technical means.	technical means.	subassemblies of technical means.	technical means. He can search for catalogs of such elements himself.
EU4	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. - presented to students during first classes, if required by the formula classes are sent electronically to the e-mail addresses of individual dean groups.
2. Information about the place of classes - Information can be found on the website of the Faculty of Management.
3. Information about the timing of classes (day of the week / time) - Information can be found on the website of the Faculty of Management.
4. Information about the consultation (time + place) - Information can be found on the website of the Faculty of Management.