Kielce University of Technology

FACULTY OF MECHATRONICS AND MECHANICAL ENGINEERING

Annex 9
to the Rector's Ordinance No. 35/19
of 12 June 2019

COURSE SPECIFICATION

Course code	**M#1-S1-ME-111**
Course title in Polish	**Maszynoznawstwo**
Course title in English	**Theory of Machines**
Valid from (academic year)	**2019/2020**

GENERAL INFORMATION

Programme of study	**MECHANICAL ENGINEERING**
Level of qualification	**first-cycle**
Type of education	**academic**
Mode of study	**full-time**
Specialism	**Maintenance and Logistics**
Department responsible	**Department of Terotechnology and Industrial Laser Systems**
Course leader	**Prof. dr hab. inż. Bogdan Antoszewski**
Approved by	

COURSE OVERVIEW

Course type	**basic**
Course status	**compulsory**
Language of instruction	English
Semester of delivery	**semester 2**
Pre-requisites	**None**
Examination required (YES/NO)	NO
ECTS value	**1**

Mode of instruction	**lecture**	**class**	**laboratory**	**project**	**seminar**
No. of hours per semester	**15**				

LEARNING OUTCOMES

Category of outcome	Out-come code	Course learning outcomes	Corresponding programme outcome code
Knowledge	W01	They have a basic knowledge of the principles of design of mechanical components and systems.	MiBM_W08
	W02	They have a fundamental knowledge of development trends in machine design, manufacture, operation and maintenance.	MiBM_W09
Skills	U01	On completion of this programme students are able to obtain information from the literature, databases and other sources in various languages; they are able to combine, analyse and interpret the information, draw conclusions and formulate and justify opinions.	MiBM1_U03
	U02	They are able to identify and define an engineering problem; they are able to develop specifications that meet the design requirements necessary to solve an engineering problem, as appropriate to their specialism field of study.	MiBM1_U21
Competence	K01	On completion of this programme students understand the need for and know the opportunities of gaining further professional qualifications (second cycle programmes, third cycle programmes, postgraduate non-degree courses, training courses) to enhance their professional, personal and social development.	MiBM1_K01
	K02	Is aware of the social role of a technical university graduate and understands the need to provide public opinion in an understandable manner with information on achievements related to the field of study of Mechanical Engineering	MiBM1_K06

COURSE CONTENT

Type of instruction*	Topics covered
lecture	1. Machines and civilization – classification of machines and theirs role in present world, load of machines, structural materials.
	2. Water- machines, impeller and displacement pumps, water turbine and hydro-electric power plant – the principle of operations, parameters of work, fundamentals of design.
	3. Machines applied in hydraulic systems (gear pumps, axial piston pumps, sliding-vane pumps, gerotor pumps), fluid drives, hydraulic and hydrokinetic torque converter, hydraulic manipulators and servo-motors, hydraulic accumulators.
	4. From windmill to modern wind power plant – evolution of design, compressors and fans – classification, bases and parameters of operation, examples.
	5. Internal-combustion engines – general classification, piston engines, power and efficiency of engines, feed systems and timing gear systems.
	6. Jet-propulsion motor, jet engines, ramjet, turbo-jets – operation, examples of construction.
	7. Machines for machining – classification, construction elements of lathes, drills and milling machines, examples of construction.

ASSESSMENT METHODS

Outcome code	Methods of assessment *(Mark with an X where applicable)*					
	Oral examination	Written examination	Test	Project	Report	Other

W01			X			
W02			X			
U01			X			
U02			X			
K01						X
K02						X

ASSESSMENT TYPE AND CRITERIA

Mode of instruction*	Assessment type	Assessment criteria
lecture	**non-examination assessment**	*The pass mark is a minimum of 50% for all the in-class tests.*

OVERALL STUDENT WORKLOAD

ECTS weighting								
	Activity type	**Student workload**						**Unit**
1.	Scheduled contact hours	L	C	Lab	P	S		h
		15						
2.	Other contact hours (office hours, examination)	2						h
3.	**Total number of contact hours**	**17**						h
4.	**Number of ECTS credits for contact hours**	**0,7**						ECTS
5.	**Number of independent study hours**	**8**						h
6.	**Number of ECTS credits for independent study hours**	**0,3**						ECTS
7.	**Number of practical hours**	**0**						h
8.	**Number of ECTS credits for practical hours**	**0,0**						ECTS
9.	**Total study time**	**25**						h
10.	**ECTS credits for the course** *1 ECTS credit = 25-30 hours of study time*	**1**						ECTS

READING LIST

1. Robert L. Norton, "Design of Machinery, An Introduction to the Synthesis and Analysis of Mechanisms and Machines", 3rd Edition, McGraw Hill - Higher Education, 2004,
2. Robert C. Juvinall and Kurt M. Marshek, "Fundamentals of Machine Component Design", 3rd Edition, John Wiley & Sons, 2000,
3. Handbook of Diesel Engines, Publisher: Springer, 2010
4. Ernst Mach: The Science Of Mechanics, Metcalf Press, 2007,
5. Aerospace Engineering Desk Reference, Publication : Elsevier LTD., 2009,
6. Prof. Dr.-Ing. Friedrich-Wilhelm Bach, Dr. Andreas Laarmann, Dipl.-Ing. Thomas Wenz: Modern Surface Technology, 2006 Wiley-VCH Verlag GmbH & Co. KGaA
7. K.E. Schneider, V. Belashenko, M. Dratwiński, S. Siegmann, A.Zagorski: Thermal Spraying for Power Generation Components WILLEY-VCH 2006
8. W. Włosinski: The joining of advanced materials. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 1999.
9. R.E. Hummel: Understanding materials science : history, properties, applications.