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-203**
Course title in Polish	**MECHANIKA OGÓLNA I**
Course title in English	**Engineering Mechanics I**
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	**all**
Department responsible	**Department of Mechanics**
Course leader	**Dr inż. Jan Kyzioł**
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	**5**

Mode of instruction	**lecture**	**class**	**laboratory**	**project**	**seminar**
No. of hours per semester	**30**	**30**	**15**		

LEARNING OUTCOMES

Category of outcome	Out-come code	Course learning outcomes	Corresponding programme outcome code
Knowledge	W01	The student knows the basic concepts and theorems of statics, has knowledge and understanding of the equilibrium of material points and rigid bodies loaded with force systems and pairs of forces.	MiBM1_W02
	W02	The student has knowledge of the basic models of: dry friction, rolling resistance, belt friction.	MiBM1_W02
	W03	The student knows and understands the basics of describing the motion of a material point and a rigid body.	MiBM1_W02
Skills	U01	The student is able to determine static reactions in planar and spatial systems of concurrent and general system of forces, also in cases with frictional interactions.	MiBM1_U01
	U02	The student is able to determine the trajectory, speed and acceleration of a point for various cases of motion of material points and rigid bodies.	MiBM1_U01
	U03	The student is able to perform basic measurements of mechanical quantities	MiBM1_U11
Competence	K01	The student is aware of the responsibility for the technical, social and environmental effects of the tasks performed.	MiBM1_K02

COURSE CONTENT

Type of instruction*	Topics covered
lecture	Basic concepts of mechanics. Definitions of terms: a rigid body, force, force systems, constraints, mechanism. Statics Axioms of statics. Principles of operation on vectors, addition and multiplication of vectors. Force as a vector. Moment of force about a point and about an axis. A pair of forces. Systems of forces, reduction of systems of forces. Concurrent force system: resultant, equilibrium conditions of the concurrent force system. Plane force system: reduction of a plane force system to the main vector and main moment, resultant of a plane force system, equilibrium conditions of a plane force system. The phenomenon of friction. The force of friction. Rolling resistance. Belt friction. Block and belt brake. Reduction of the spatial force system: torsion, equation of the central axis, equilibrium conditions of the spatial force system. Reduction and equilibrium of the system of parallel forces. Centers of gravity. Pappus-Guldin theorem. Rigid body mass geometry. Moments of inertia of solids. Centrifugal moments. Steiner theorem. Kinematics Material point kinematics. Equations of motion of a point in Cartesian coordinate system. Equation of motion of a point on a track. Fundamentals of the kinematics of a rigid body. Classification of mass movements. Rotational motion of a rigid body. Multistage gears. Plane motion of a rigid body. Relative movement
class	Solving problems within the scope of the lecture.
laboratory	Solving problems within the scope of the lecture.

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			
W03			X			
U01			X			
U02			X			
U03					X	
K01						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 the final in-class test.
class	non-examination assessment	The pass mark is a minimum of 50% for all the in-class tests.
laboratory	non-examination assessment	The pass mark is a minimum of 50% for each pre-lab test and each post-lab report.

*) Please delete rows in the table above that are not applicable.

OVERALL STUDENT WORKLOAD

ECTS weighting								
	Activity type	**Student workload**					**Unit**
1.	Scheduled contact hours	L	C	Lab	P	S	h
		30	30	15			
2.	Other contact hours (office hours, examination)	2	2	2			h
3.	**Total number of contact hours**	**81**					h
4.	**Number of ECTS credits for contact hours**	**3,2**					ECTS
5.	**Number of independent study hours**	**44**					h
6.	**Number of ECTS credits for independent study hours**	**1,8**					ECTS
7.	**Number of practical hours**	**75**					h
8.	**Number of ECTS credits for practical hours**	**3,0**					ECTS
9.	**Total study time**	**125**					h
10.	**ECTS credits for the course** *1 ECTS credit = 25-30 hours of study time*	**5**					ECTS

READING LIST

1. Hibeler R.C., Engineering mechanics –Statics 12th edition
2. Dietmar Gross, Werner Hauger, Jörg Schröder, Wolfgang A. Wall, Nimal Rajapakse, Engineering Mechanics, 2nd Edition, 2018 Springer
3. T.W.B. Kibble F.H. Berkshire, Classical Mechanics, Imperial College Press 5th Edition