



Faculty of Civil and Environmental Engineering						
Study programme:	Construction and Building Systems Engineering		Degree level:	full-time	Bachelor's degree full-time programme	
Specialization			Diploma path:			
Module name:	Theoretical mechanics					
Module type:	obligatory	Semester:	1	ECTS	4	Module ID: CBSE1116
No. of hrs in semester:	L - 30	C - 30	LC-	P-	SW-	S-
Prerequisites:	<i>Complete with prerequisites or "-"</i>		"-"			
Aims and objectives:	<i>Description of the assumed knowledge, skills and social competence the student should have acquired after the completion of the module:</i>		Students become familiar with statics general notions and principles. Students can learn how to identify statically determinate and over-rigid structures, can learn to create the equations of equilibrium and calculate reactions for beams and frames and determine forces in planar trusses, can draw internal forces diagrams for plane bar structures. Students become familiar with the way of determining the centre of figure and solid.			
Forms of teaching activities:	<i>lecture, classes, laboratory classes, project, specialization workshop, seminar</i>		Assessment:	<i>Evaluation must be relevant to the intended learning outcomes</i>		
			Lecture - written tests, classes - tests			
Module content:	<i>Complete with the module content: (max. 1000 characters)</i>		Statics general notions and principles. Force system resultants. Static equilibrium. Centre of figure and solid. Types of rod structures. Reactive forces and moments of beam and frame structures. Structural analysis of planar trusses. Internal forces diagrams. Static and kinetic friction.			
Teaching methods:	lecturing, multi media presentation, direct instruction, solving problems on the board					
Learning outcome	<i>Specify min. 4, max. 8 learning outcomes in the following order: knowledge – skills – competence. Each learning outcome must be verifiable</i>				<i>Reference to the programme learning outcomes</i>	
LO1	Student has ordered knowledge in the range of statics, can define constraints and their reactions				CBSE_W01, CBSE_W04, CBSE_W05	
LO2	Student can identify statically determinate and over-rigid structures				CBSE_W04, CBSE_U09	
LO3	Student can create the equation of equilibrium and calculate reactions for beams and plane and spatial frames				CBSE_W04, CBSE_U09	
LO4	Student can calculate forces in planar trusses				CBSE_W04, CBSE_U09	
LO5	Student can draw internal forces diagrams for statically determinate beams and plane frames				CBSE_W04, CBSE_U09	
LO6	Student can determine the centre of figure and solid				CBSE_W04, CBSE_U09	
No. of learning outcome	Methods of assessing the learning outcome				Type of teaching activities (if more than one) during which the outcome is assessed	
LO1	written test				L, C	
LO2	written test				L, C	
LO3	written test				L, C	

LO4	written test	L, C	
LO5	written test	L, C	
LO6	written test	L, C	
Student workload (in hours)	lecture attendance	15 x 2h =	30
	participation in classes, laboratory classes, etc.	15 x 2h =	30
	preparation for classes, laboratory classes, projects, seminars, etc.		15
	working on projects, reports, etc.		15
	participation in student-teacher sessions related to the classes/seminar/project		5
	implementation of project tasks		
	preparation for and participation in exams/tests		15
		TOTAL:	110
Quantitative indicators	Student workload – activities that require direct teacher participation: 30h+30h+5h=65	65	ECTS 2,5
	Student workload – practical activities: 30h+5h+15h+15h+15h=80	80	3
Basic references:	1. Murray R. Spiegel: Theory and problems of theoretical mechanics, McGraw-Hill 2. Andy Ruina and Rudra Pratap: Introduction to Statics and Dynamics, Oxford University Press		
Supplementary references:	1. John Tinsley Oden, Junuthula Narasimha Reddy: Variational methods in theoretical mechanics, Berlin : Springer-Verlag, 1976.		
Unit:	Department of Structural Mechanics		
Date of issuing the programme:	01.02.2017	Author of the programme:	Joanna Krętońska, Phd Eng.