Field of s	study	Civil E	Engineering				
Mode of	study	statio	nary	Level	second cycle		
Graduate	e's qualification	magis	ster			WBi/	\
Area(s) c	•		techniczne			vvDi/	7
	nal profile	aener	al academic				
Module		gene				-	
Course u	nit	Tech	nical English			-	
Code			/S2CE/A/01-1			-	
	pecialisation	/ / / / ///	(JZCL/A/01-1			- \	
		Crudi			ev eb	- 🔪 🛛	
	ering faculty			Nauki Języków Ob			
ECTS		3,0		ECTS (forms)	3,0		
	course credit		ination	Language	english		
Electives		1		Elective group			r
Form of i	instruction	Code	Semester	Hours	ECTS	Weight	Credit
foreign la	anguage course	LK	1	45	3,0	1,00	examination
Leading	teacher	Stelm	aszczyk Marek	(Marek.Stelmaszcz	zyk@zut.edu.pl)		
Other tea	achers				@zut.edu.pl), Kondy ostawski Andrzej (Ar		
Prerequis	sites	1.		<u> </u>			<u> </u>
W-1		guage	at B2 level acknow	wledged by the final	exam or a language ce	ertificate at the re	quired level.
Module/c	ourse unit objectiv	es					
C-1			cative and langua	ge competences for	special purposes.		
C-2	Ability of individua	l work v	vith technical text	s related to his/her r	major.		
Course c	ontent divided into	variou	s forms of instr	uction			Number of hours
				he following subjects	5:		
T-LK-1	Building materials						4
T-LK-2	Construction						3
T-LK-3	Reaching for perfe			signal toyta Drafasa	ional toxt structure		3
T-LK-4	The challenges of r		or reading profes	ssional texts. Profess			2
T-LK-5	The Bibliotheka Ale	exandrir					7
			ssional texts. Pas	sive and related forn	ns.		
T-LK-6 T-LK-7	How skyscrapers w The Empire State E						4
T-LK-7	Introduction to tun						4
T-LK-9	Classification of br	-					2
T-LK-10	Evolution of bridge	S					3
T-LK-11	Collocations and id Roads - terminolog		scientific papers.				3
T-LK-11 T-LK-12	Roads - design	У					3
T-LK-12	. Roads - paving m	ethods					3
	workload - forms of						Number of hours
A-LK-1	Practical classes	activit	.y				45
A-LK-1 A-LK-2	Preparation for class	sses					30
A-LK-3	Individual tutorials						3
A-LK-4	Preparation for exa						10
A-LK-5	Exam						2
Teaching	n methods / tools						1
M-1	Practical classes						
M-2	Group work						
M-3	Presentation						
L							

	g method								
M-4	Discus	sion							
M-5	Work v	vith text							
М-6	Listeni	ng comprehension							
Evaluati	ion metho	ods (F - progressive, P - final)							
S-1	F	Presentation (F)							
S - 2	F	Written exam (S)							
	Desigr	ned learning outcomes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course content	Teaching methods	Evaluation methods
Knowled	dge								
specialist	guage struc	tures used in specialist texts and selected or the programme of studies	B-A_2A_W16		P7S_WG_IA21	C-1	T-LK-1 T-LK-8 T-LK-2 T-LK-9 T-LK-3 T-LK-10 T-LK-4 T-LK-11 T-LK-5 T-LK-12 T-LK-6 T-LK-13 T-LK-7	M-2 M-3	S-1 S-2
Skills							T		
B-A_2A_A// can speak		l subjects related to his/her major	B-A_2A_U02 B-A_2A_U03 B-A_2A_U04 B-A_2A_U06	P7S_UK		C-1	T-LK-1 T-LK-8 T-LK-2 T-LK-9 T-LK-3 T-LK-10 T-LK-4 T-LK-11 T-LK-5 T-LK-12 T-LK-6 T-LK-13 T-LK-7	M-3 M-4	S-1 S-2
B-A_2A_A/, is able to u in his/her f	understand f	texts and use basic specialist vocabulary	B-A_2A_U06	P7S_UK		C-2	T-LK-1 T-LK-8 T-LK-2 T-LK-9 T-LK-3 T-LK-10 T-LK-4 T-LK-11 T-LK-5 T-LK-12 T-LK-6 T-LK-13 T-LK-7	M-1 M-5	S-1 S-2
Other so	ocial / per	rsonal competences							
	f the need o	f further education and self-improvement e competences	B-A_2A_K06	P7S_KR		C-2	T-LK-1 T-LK-8 T-LK-2 T-LK-9 T-LK-3 T-LK-10 T-LK-4 T-LK-11 T-LK-5 T-LK-12 T-LK-6 T-LK-13 T-LK-7 T-LK-7	M-1 M-3	5-2
Require	d reading	1							
		Joanna Wrona, Modern Wonders of Ci	vil Engineering, S	SPNJO Politech	nniki Krakowsl	kiej, Kra	ków, 2007		
2. Ilona V	Nojewódzk	a-Olszówka, Architecture in English –	English for Archi	itecture, SPNJ	O Politechniki	Krakow	skiej, Kraków,	2004	
3. Eliza R	Romaniuk,	Reader Friendly Civil Engineering, SP	NJO Politechniki I	Krakowskiej, k	Kraków, 2005				
4. Sandra Kraków, 2		a-Stanek, Alicja Półtorak-Filipowska, R	eading Compani	on for Studen	ts of Architect	ure, SPI	NJO Politechnik	i Krakov	vskiej,
Supplen	nentary r	eading							
1. Matt Ik	bbotson, T	echnical Construction Language, Inter	rmediate Course	No. 1, Cambr	idge				
2. Quality	y Manager	nent in Construction, Advanced Cours	se No. 6						
3. B. Flet	cher, HIST	ORY OF ARCHITECTURE, The Royal In	stitute of British	Architects an	d University o	f Londoi	n, 1996		
4. E. Alle	n, FUNDAN	IENTALS OF BUILDING CONSTRUCTIO	N. Materials and	Methods, Joh	n Wiley and S	ons, 198	85		
5. D.H. B	esterfield,	QUALITY CONTROL, Pearson Prentice	Hall, 2004						
6. Techni	ical Constr	uction Language. Intermediate Cours	e No.1						

				-	-			
Field of s	study	Civ	vil Er	ngineering				
Mode of s	study	sta	ation	ary	Level	second cycle		
Graduate	e's qualific	ation m	agist	er	1		WBi/	Δ
Area(s) o	of study	na	auki t	echniczne				`
Educatio	nal profile	ge	enera	al academic				
Module							-	
Course u	nit	Po	olish	Language a	nd Culture		-	
Code				52CE/A/01-2			-	
	pecialisati						- \	
	ering facu		udiu	m Praktycznej	Nauki Języków Ob	cych		
ECTS	y	3,0			ECTS (forms)	3,0		
	course cre			nation	Language	polish		
Electives		1	lanni		Elective group	polisii		
				C a ma a ata m		E CTC	14/2:5:64	Credit
	instruction		ode	Semester	Hours	ECTS	Weight	Credit
	anguage c		K	1	45	3,0	1,00	examination
Leading t		Ma	aziar	z Anna (Anna.I	Maziarz@zut.edu.p	l)		
Other tea	achers							
Prerequis								
W-1	Knowled	ge of English l	langu	age at B2 level a	acknowledged by the	e final exam or a langu	age certificate at	the required level.
Module/c	course unit	objectives						
C-1	Developr	ment of comm	nunica	ative and langua	ge competences for	special purposes.		
C-2	Ability of	individual wo	ork wi	th technical text	s related to his/her r	najor.		
Course c	ontent div	ided into vai	rious	forms of instru	uction			Number of hours
T-LK-1	Greeting	s, farewell, int	trodu	ctions				4
T-LK-2	Presenta	tion Yourself a	and o	thers				3
T-LK-3	Interests	, hobbies						3
T-LK-4				communicate, w				2
T-LK-5				caffe, restauran		ione Doon's office Ha	w to orrange	4
T-LK-6	matters?		tuden	it in Polanu. Ben	aviour, typical situat	ions, Dean's office. Ho	w to arrange	7
T-LK-7		story and cult						10
T-LK-8		as a universit						2
T-LK-9	Basics of	the Polish teo	chnic	al language in ci	vil engineering			10
Student v	workload -	forms of ac	tivity	/				Number of hours
A-LK-1		classes						45
A-LK-2	Practical							
	Preparat	ion for classes	s					30
A-LK-3	Preparat Individua	ion for classes Il tutorials	S					3
A-LK-3 A-LK-4	Preparat Individua Preparat	ion for classes	S					3 10
A-LK-3 A-LK-4 A-LK-5	Preparat Individua Preparat Exam	ion for classes al tutorials ion for exam	S					3
A-LK-3 A-LK-4 A-LK-5 Teaching	Preparat Individua Preparat Exam	ion for classes Il tutorials ion for exam / tools	S					3 10
A-LK-3 A-LK-4 A-LK-5 Teaching M-1	Preparat Individua Preparat Exam methods Practical	ion for classes al tutorials ion for exam / <i>tools</i> classes	S					3 10
A-LK-3 A-LK-4 A-LK-5 Teaching M-1 M-2	Preparat Individua Preparat Exam methods Practical Group we	ion for classes al tutorials ion for exam / <i>tools</i> classes ork	S					3 10
A-LK-3 A-LK-4 A-LK-5 Teaching M-1 M-2 M-3	Preparat Individua Preparat Exam methods Practical Group we Presenta	ion for classes al tutorials ion for exam / <i>tools</i> classes ork tion	S					3 10
A-LK-3 A-LK-4 A-LK-5 Teaching M-1 M-2 M-3 M-4	Preparat Individua Preparat Exam <i>rethods</i> Practical Group wo Presenta Discussio	ion for classes al tutorials ion for exam / tools classes ork tion	s					3 10
A-LK-3 A-LK-4 A-LK-5 Teaching M-1 M-2 M-3	Preparat Individua Preparat Exam methods Practical Group wo Presenta Discussio Work wit	ion for classes al tutorials ion for exam / tools classes ork tion						3 10
A-LK-3 A-LK-4 A-LK-5 Teaching M-1 M-2 M-3 M-4 M-5 M-6	Preparat Individua Preparat Exam Practical Group we Presenta Discussio Work wit Listening	ion for classes al tutorials ion for exam / tools classes ork tion on h text comprehensi	ion	р. <i>Р - final</i>)				3 10
A-LK-3 A-LK-4 A-LK-5 Teaching M-1 M-2 M-3 M-4 M-5 M-6	Preparat Individua Preparat Exam Practical Practical Group we Presenta Discussio Work wit Listening	ion for classes al tutorials ion for exam / tools classes ork tion on h text	ion	e, P - final)				3 10

Designed learning outcomes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course content	Teaching methods	Evaluation methods
Knowledge							
CE_2A_CE/A/01a_W01 knows language structures used in specialist texts and selected specialist vocabulary for the programme of studies	B-A_2A_W16		P7S_WG_IA21	C-1	T-LK-1 T-LK-6 T-LK-2 T-LK-7 T-LK-3 T-LK-8 T-LK-5 T-LK-9	M-1 M-2 M-3 M-5	S-1 S-2
Skills							
CE_2A_CE/A/01a_U01 can speak on technical subjects related to his/her major	B-A_2A_U02 B-A_2A_U03 B-A_2A_U04 B-A_2A_U06	P7S_UK		C-1	T-LK-1 T-LK-6 T-LK-2 T-LK-7 T-LK-3 T-LK-8 T-LK-5 T-LK-9	M-1 M-2 M-3 M-4 M-6	S-1 S-2
CE_2A_CE/A/01a_U02 is able to understand texts and use basic specialist vocabulary in his/her field	B-A_2A_U06	P7S_UK		C-2	T-LK-1 T-LK-6 T-LK-2 T-LK-7 T-LK-3 T-LK-8 T-LK-5 T-LK-9	M-1 M-5	S-1 S-2
Other social / personal competences	•		•				
CE_2A_CE/A/01a_K01 is aware of the need of further education and self-improvement in developing language competences	B-A_2A_K06	P75_KR		C-2	T-LK-1 T-LK-6 T-LK-2 T-LK-7 T-LK-3 T-LK-8 T-LK-5 T-LK-9	M-1 M-3	S-2
Required reading							
1. Polski krok po kroku - coursebook, 2011							
2. Polski krok po kroku - exersise book, 2011							
3. Learning platform: e-polish.eu, 2017							
Supplementary reading							
1. Matt Ibbotson, Technical Construction Language, Inter	mediate Course	No. 1, Cambr	idge				
2. B. Fletcher, HISTORY OF ARCHITECTURE, The Royal In	stitute of British	Architects and	d University of	Londor	n, 1996		
3. Technical Construction Language. Intermediate Cours	e No.1						

			,	5	0					
Field of st	tudy	Civil I	Engineering]			
Mode of s	tudy	statio	onary	Level	second	cycle	1			
Graduate	's qualification	magi	ster				V	VBiA		
Area(s) o	f study	nauki	techniczne							_
Educatior	nal profile	gene	ral academic							
Module										
Course ui	nit	Intel	lectual proper	ty (copyright	law)					11
Code		WBIA	/S2CE/02-1							
Field of s	pecialisation									
Administe	ering faculty	Dziek	anat	1	i					<u> </u>
ECTS		1,0		ECTS (forms)	1,0					
Form of c	ourse credit	credit	ts	Language	english					
Electives		2		Elective group)					
Form of in	nstruction	Code	Semester	Hours		ECTS	We	eight	Credi	t
lecture		W	2	15		1,0	1	,00	credit	S
Leading t	eacher	SSB F	Prodziekan (Prod	lziekan.SSB@zu	ut.edu.pl)					
<i>Other tea</i>	chers	Visitir	ng Professor (Vis	siting@zut.edu.	pl), Wojtkun	Grzegorz (d	rossel@	@zut.edu.pl		
Prerequis	ites									
W-1	Knowledge of bas	ic legal t	erminology							
Module/co	ourse unit objecti	ves								
C-1			les that underlie t aspects of protec					ways and ty	oe of inte	llectual
Course co	ontent divided int	_						Nu	mber of	hours
T-W-1			s. Publishers , divi plution). Reminder							4
T-W-2	Code of administ	ng files. E	ocedure. Proceedii Evidence. Refusal † f writing.							4
T-W-3	International law copyright protect mathematical cor	on copyr ion (disconcepts, b	ight and related r overies, ideas, pro ut also normative hed patent or prot	ocedures, method acts or their offic	ls and princip cial projects, c	les of operation	on and ents, ma	aterials,		7
Student v	vorkload - forms o	of activi	tv		· · ·			Nu	mber of	hours
A-W-1	The student shou hypothetical situa method of solving participation in co participation in a	ld active ation pre- the pro ompleting least 3.	ly participate in the sented by the lect blem during the d g the course is part teacher discussio	urer and, if possi idactic discussior rticipation in 4/5 ns initiated by th	ble, present t n related to th the number o e teacher at t	heir own point le lecture. The f lectures and he end of the	t of view studen active subscrip	r and t's ot.		15
A-W-2	particular, he sho and have notes e lecture. The key a 1. the ability to fi legal situation, 2. correct interpro 3. providing the c point of view of v	uld famil nabling h activities nd and p etation o occurrenc arious er	prepare for each le liarize himself with him to speak in the are: rovide in the origin f the legal record, the legal record, e of possible cont hities of the inves and save the res	n the obligatory li e discussion initia nal wording of the rradictions, for ex tment process.	terature on th ated by the te e legal provisi ample, the in	ne issues unde acher in the fi ion regarding clusion of an i	er discus inal part a hypoti ssue fro	ssion of the hetical		15
Teaching	methods / tools									
M-1	Lecture method									
M-2	Powerpoint prese	ntation a	nd case studies re	esolveing with tea	acher					
	n methods (F - pr	-								
S-1	F Countinou	is assess	ment of student w	ork and activity						
			omes	Reference to the learning outcomes	Reference to the learning outcomes	Reference to learning outcomes	Course			Evaluatior

Knowledge								
B-A_2A_A/A/03a_W01 As a result of the course the student should be able to define issues related to intellectual property rights, in particular legal aspects of copyright and related rights protection. The student should know the ways of legal protection of intellectual property to the extent necessary to independently perform design tasks in the field of design	B-A_2A_W14 B-A_2A_W15 B-A_2A_W16	P75_WK_TA21	P75_WG_IA21 P75_WK_IA21	C-1	T-W-1 T-W-2	T-W-3	M-1 M-2	S-1
Skills								
B-A_2A_A/A/03a_U01 As a result of the course, the student should be able to analyze legal acts in terms of ensuring intellectual protection of their own creations and not violating other people's copyright and related rights. The student should know the scope of legal and criminal responsibility for acts not allowed in the scope of copyright infringement.	B-A_2A_U26	P7S_UU		C-1	T-W-1 T-W-2	T-W-3	M-1 M-2	5-1
Other social / personal competences								
B-A_2A_A/A/03a_K01 As a result of the course, the student will acquire a conscious attitude in the field of legal and criminal scope of his own creative activity as well as acts undertaken towards other artists and their work. The knowledge should enable him to act in accordance with his own conviction and not to violate applicable law in the area of protection of copyright and related rights under copyright law.	B-A_2A_K09	P7S_KR		C-1	T-W-1 T-W-2	T-W-3	M-1 M-2	S-1
Required reading								
1. Paul Goldstein, Bernt Hugenholz, International Copyrig 0199794294								
2. Editor: Adam Jolly, The Handbook of European Intellector company's intellectual property, Kogan Page, 2015, 4th		Management	Developing, m	ianagir	ng and p	orotectir	ng your	
	T I I I'I I'	<u>с </u>		20	<u> </u>	E 1111		

3. Vivien Irish, Intellectual Property Rights for Engineers, The Institution of Engineering and Technology, 2005, 2nd Edition

				-	_	_						
Field of st	udy		Civil E	Ingineering		1						
Mode of s	tudy		statio	nary	Level	second	cycle					
Graduate'	-	ication	magis	ster				V	VBiA	\ \		
Area(s) of	f study		nauki	techniczne						_		
Education	al profi	le	gener	al academic					- 11			
Module									- 11	п	ILn	
Course un	nit		Intel	ectual proper	ty				- 11			
Code			WBIA,	/S2CE/02-2					- 11			
Field of sp	pecialisa	ation							. II			
Administe	ering fac	culty	Dziek	anat						<u> </u>		
ECTS			1,0		ECTS (forms)	1,0						
Form of co	ourse c	redit	credit	S	Language	english						
Electives			2		Elective group)]				
Form of in	nstructio	on	Code	Semester	Hours		ECTS	We	eight		Credit	t
lecture			W	2	15		1,0	1	,00		credit	s
Leading te	eacher		SSB P	rodziekan (Prod	Iziekan.SSB@zı	ut.edu.pl)			•			
Other tea			Visitir	ng Professor (Vis	siting@zut.edu.	pl)						
Prerequisi	ites											
W-1		nowledge of	indust	rial property.								
Module/co	burse ui	nit objective	25									
C-1		n knowledge		strial property pro	otection, to unde	rstand and us	e internationa	l condit	ions asso	ciated	to app	licatior
Course co	ntent a	ivided into	variou	s forms of instru	uction					Numl	ber of	hours
T-W-1		al information ty protection		ection of industria	l property. Intern	ational organi	zations for int	electua	I			2
T-W-2				ns, international	procedure PCT of	application, E	European pate	ent.				4
T-W-3	Industi	rial patterns,	applica	ation procedure in	international pe	rspective.						2
T-W-4		marks, appli										3
T-W-5	Patent	information,	patent	classification.								4
Student w	orkload	l - forms of	activit	<i>y</i>						Numl	ber of	hours
A-W-1		ce on lecture										15
A-W-2	· ·		-	view of materials								4
A-W-3 A-W-4		data base re ation for sub										4
A-W-4 A-W-5	-	tancies	ject pa	ssing								1
A-W-6	Test											1
Teaching		ls / tools										
M-1	_	e with preser	ntation									
Evaluation		•		ve, P - final)								
S-1	F		-	t on lectures								
5-2	Р	written test										
	Desigr	ned learning	g outco	omes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course cor		Teaching methods	Evaluatio methods
Knowledg	е				,							•
B-A_2A_A/A/C knows the leaprotection, so basic items c	gal frame ources of	patent information	l and inc ation, kn	dustrial property ows definitions of	B-A_2A_W15	P75_WK_TA21	P7S_WK_IA21	C-1		·W-4 ·W-5	M-1	S-1 S-2
Skills						<u>.</u>	<u>.</u>			I		

B-A_2A_A/A/03b_U01 can estimate if his intellectual work effect may be protected, can choose the specific manner of intellectual protection, can use available data base.	B-A_2A_U11 B-A_2A_U26	P7S_UK P7S_UU	C-	T-W-1 T-W-2 T-W-3	T-W-5	M-1	S-1 S-2
Other social / personal competences							
B-A_2A_A/A/03b_K01 student will use legal possibilities to protect his own intellectual work effects and will use creative results of other people according to international law. Student will use effrctivelly available data bases.	B-A_2A_K07 B-A_2A_K09	P7S_KR	C-	T-W-1 T-W-2 I T-W-3		M-1	S-1 S-2
Required reading							
1. John Palfrey, Intellectual Property Strategy, MIT Press,	Boston Masachu	isets USA, 201	11, ISBN: 9780262	297998			
2. Ed.: Adam Jolly, The Handbook of European Intellectua	l Property Mana	gement Devel	loping, Kogan Pres	s, 2015			

Field of st	udy		Civil E	Engineering					
Mode of s	tudy		statio	nary	Level	second c	ycle		
Graduate'	s qualif	ication	magis	ster				WBi	Δ
Area(s) of	study		nauki	techniczne					
Education	al profi	le	gener	ral academic					
Module									
Course un	nit		PHS	- History of Ar	t				
Code			WBIA,	/S2CE/A/03-1					
Field of sp	pecialisa	ation							
Administe	ering fac	culty	Kated	Ira Sztuk Wizual	Inych				
ECTS	-	-	2,0		ECTS (forms)	2,0			
Form of co	ourse ci	redit	credit	S	Language	english		-	
Electives			3		Elective group			_	
Form of in	structio	n	Code	Semester	Hours	F	CTS	Weight	Credit
lecture			W	1	30		2,0	1,00	credits
Leading te	eacher		SZCZE		szczepanik@zut.e			,	
Other tea			Arlet		ut.edu.pl), Rutyna	-	tyna@zut.@	edu.pl), Visitir	ng Professor
Prerequisi	ites								
W-1		nowledge of	f history	and art history is	s required.				
Module/co	ourse ur	nit objectiv	es						
C-1	Unders	tanding the	leading	j trends and style n a selected topic	s in art from antiqui c in the history of ar	ty to modern t.	times.		
Course co	ntent d	ivided into	variou	s forms of instru	uction				Number of hours
T-W-1	Introdu	iction. Ancie	nt and	Roman art					2
T-W-2	Gothic	art							4
T-W-3		he renaissar	nce						2
T-W-4	Baroqu								4
T-W-5		ism and rom							2
T-W-6 T-W-7	_	iveau and in		onism					2
T-W-8		l neo-vangua	-						4
T-W-9		nporary art							4
T-W-10		g lectures							2
Student w	vorkload	l - forms of	activit						Number of hours
A-W-1		tory particip		<u>.</u>					30
A-W-2	Own w	ork							20
A-W-3	Prepar	ation of a sy	nthetic	A3 format board	on a topic selected	from the lect	ure		10
Teaching	method	ls / tools							
M-1	Lecture	e with multir	nedia p	resentation / com	puter with multimed	dia projector			
Evaluation	n metho	ods (F - pro	gressiv	/e, P - final)					
S-1	F				a board on a selected	d topic, obtai	ning information	ation from liter	ature and databases.
5-2	F	Passing the	colloqu	Jium				1	
	Desigr	ned learnin	g outco	omes	learning outcomes	rticular areas of	Reference to earning outcomes leading to the egree of "inżynier"	Course objectives Course	content Teaching Evaluation methods
Knowledg	е					I		<u>ı </u>	
inowieag	C								

B-A_2A_A/A/02-1_W01 Student acquires knowledge about the history of art. recognizes styles and can characterize their features. He knows the latest trends and trends. He recognizes the works of outstanding artists.	B-A_2A_W16		P7S_WG_IA21	C-1	T-W-1 T-W-2 T-W-3 T-W-4 T-W-5	T-W-6 T-W-7 T-W-8 T-W-9 T-W-10	M-1	S-1 S-2
Skills								
B-A_2A_A/A/02-1_U01 Student can acquire and make data selection. He interprets data properly and is able to integrate and present them.	B-A_2A_U26	P7S_UU		C-1	T-W-1 T-W-2 T-W-3 T-W-4 T-W-5	T-W-6 T-W-7 T-W-8 T-W-9 T-W-10	M-1	S-1 S-2
B-A_2A_A/A/02-1_U02 Student is able to integrate knowledge of art history.	B-A_2A_U26	P7S_UU		C-1	T-W-1 T-W-2 T-W-3 T-W-4 T-W-5	T-W-6 T-W-7 T-W-8 T-W-9 T-W-10	M-1	S-1 S-2
Other social / personal competences								
B-A_2A_A/A/02-1_K01 Reliably develops and presents the results of his/her work.	B-A_2A_K09	P75_KR		C-1	T-W-1 T-W-2 T-W-3 T-W-4 T-W-5	T-W-6 T-W-7 T-W-8 T-W-9 T-W-10	M-1	S-1 S-2
Required reading								
1. Ernest Gombrich, The Story of Art, Phaidon Press Limit	ed, London, 195	0						
Supplementary reading								
1. Jan Białostocki, The Message of Images. Studies in the	History of Art, I	rsa Verlag, 19	988					
2. Arnason H. Harvard, History of Modern Art: Painting, So 2004	culpture, Archite	ecture, Photo	graphy., Upper	Saddle	e River,	N.J., Prei	ntice Ha	all,

Field of s		1				1				
	tudy	Civil E	ngineering							
Mode of s	study	station	nary	Level	second cy	cle				
Graduate	's qualification	magist	ter	1			\٨/	BiA		
Area(s) o	f study	nauki t	techniczne				V V			
Educatio	nal profile	genera	al academic					חר		
Module	· · ·							- 11 :		
Course u	nit	PHS -	History of Ci	vil Engineering				- 11 1	니문	
Code		-	52CE/A/03-2					- 11 1	1 [
	pecialisation							- 11 1		
	ering faculty	Katedr	a Geotechniki					<u> </u>	յլլե	
ECTS		2,0		ECTS (forms)	2,0					
	course credit	credits		Language	english					
Electives		3	,	Elective group	crigiisti					
			Comostor			TC	Main	ht	Credi	
	nstruction	Code	Semester	Hours	ECT		Weig			-
lecture		W	1	30	2,	U	1,00	J	credit	5
Leading t	teacher			ndrzej.Pozlewicz@	-					
Other tea	achers		yciel WBiA - (a sor (Visiting@z	@b), Paczkowski \ zut.edu.pl)	Wiesław (Wie	slaw.Paczk	cowski@	zut.edu.j	pl), Visitii	ng
Prerequis										
W-1	English skills at lea									
W-2	Bachelor's degree	in civil er	ngineering							
Module/c	ourse unit objective	es								
C-1		nowledg	-	eering from historica						
		nowledg crucial te	-	eering from historica ilding materials on s		st centuries	as well a	s on econ	omy,	
C-1 C-2	To show impact of environment and ir ontent divided into	crucial tends ndustry. various	echnologiies, bu	ilding materials on s uction	society over las			Νι	omy, umber of	hours
C-1 C-2	To show impact of environment and ir ontent divided into Crucial development	crucial tendustry. various nts in civ	echnologiies, bu forms of instr il engineering o	ilding materials on s uction ver last centuries, n	ew technologie	es and their		Νι	-	hours 4
C-1 C-2 Course co	To show impact of environment and ir ontent divided into Crucial development built environment. Progress of concret	crucial te ndustry. <i>various</i> nts in civ Social ar te structo	echnologiies, bu forms of instr il engineering o nd economic asp ures over last de	ilding materials on s uction ver last centuries, n pects of selected stru- ecades, new technol	ew technologie uctures over th	es and their ne world	impact o	Nu on	-	
C-1 C-2 Course co T-W-1	To show impact of environment and ir ontent divided into Crucial developmen built environment. Progress of concret impact on economy	nowledg crucial to ndustry. <i>various</i> nts in civ Social ar te struct y and his structure	echnologiies, bu forms of instr vil engineering o nd economic asp ures over last de story in local and	ilding materials on s uction ver last centuries, n pects of selected stru- ecades, new technol	ew technologie uctures over th ogies, spectace	es and their ne world ular structur	impact o res and tl	n heir	-	4
C-1 C-2 Course co T-W-1 T-W-2	To show impact of environment and ir ontent divided into Crucial developmen built environment. Progress of concret impact on economy Bridges as crucial s discussed on case Geotechnical engir	crucial tendustry. <i>Various</i> nts in civ Social ar te structure structure studies neering, r	echnologiies, bu forms of instr il engineering o nd economic asp ures over last de story in local and s in Europe and modern technolog	ilding materials on s uction ver last centuries, n pects of selected stru- ecades, new technol I global scale	ew technologie uctures over th ogies, spectact gnifficance and	es and their ne world ular structur d modern te	impact o res and tl echnologi	οn heir es	-	4
C-1 C-2 Course co T-W-1 T-W-2 T-W-3 T-W-4	To show impact of environment and ir ontent divided into Crucial developmen built environment. Progress of concret impact on economy Bridges as crucial s discussed on case Geotechnical engir Development of so Massive hydrotech	rowledg crucial te ndustry. <i>Various</i> nts in civ Social ar te structure structure studies neering, r il testing nical stru	echnologiies, bu s forms of instr vil engineering o nd economic asp ures over last de story in local and s in Europe and modern technolo and research uctures built ove	ilding materials on s uction ver last centuries, n bects of selected stru- cades, new technol global scale other continents. Si ogies of soil improve er last decades, their	ew technologie uctures over th ogies, spectact gnifficance and ment and their r influence on s	es and their ne world ular structur d modern te r impact on society, envi	impact o res and tl echnologi environn ironment	Nι on heir es nent.	-	4 3 4 4 4
C-1 C-2 Course co T-W-1 T-W-2 T-W-3	To show impact of environment and ir ontent divided into Crucial developmen built environment. Progress of concret impact on economy Bridges as crucial s discussed on case Geotechnical engir Development of so Massive hydrotech local and in larger studies	nowledg crucial te ndustry. <i>Various</i> nts in civ Social ar te structure structure studies neering, r il testing nical stru scale ecc	echnologiies, bu s forms of instr vil engineering o nd economic asp ures over last de story in local and s in Europe and modern technolo and research uctures built ove pnomy, flood pro	ilding materials on s uction ver last centuries, n bects of selected stru- cades, new technol global scale other continents. Si ogies of soil improve r last decades, their otection and water n	ew technologie uctures over th ogies, spectact gnifficance and ment and their r influence on s nanagement in	es and their ne world ular structur d modern te r impact on society, envi chosen cou	impact o res and tl echnologi environn ironment untries, ca	Nι on heir es nent. ;, ase	-	4 3 4
C-1 C-2 Course co T-W-1 T-W-2 T-W-3 T-W-4	To show impact of environment and ir ontent divided into Crucial developmen built environment. Progress of concret impact on economy Bridges as crucial s discussed on case Geotechnical engir Development of so Massive hydrotech local and in larger studies Roads infrastructur role of communicat	rnowledg crucial te ndustry. <i>Various</i> nts in civ Social an te structure structure studies neering, n il testing nical stru scale ecc re develo	echnologiies, bu s forms of instr vil engineering o nd economic asp ures over last de story in local and s in Europe and modern technolo and research uctures built ove ponomy, flood pro opment in Europ ems in society, g	ilding materials on s uction ver last centuries, n bects of selected stru- cades, new technol global scale other continents. Si ogies of soil improve er last decades, their	ew technologie uctures over th ogies, spectact gnifficance and ment and their r influence on s nanagement in erican continer es, logistics in	es and their ne world ular structur d modern te r impact on society, envi chosen cou nts over last	impact o res and tl echnologi environn ironment untries, co t decades	heir es nent. ;, ase s. The	-	4 3 4 4 4
C-1 C-2 Course co T-W-1 T-W-2 T-W-3 T-W-4 T-W-5	To show impact of environment and ir ontent divided into Crucial developmen built environment. Progress of concret impact on economy Bridges as crucial s discussed on case Geotechnical engir Development of so Massive hydrotech local and in larger studies Roads infrastructur role of communicat implementation ne	rnowledg crucial te ndustry. <i>Various</i> nts in civ Social ar te structure studies neering, r il testing nical stru scale ecc re develo tion syste w constr	echnologiies, bu s forms of instr vil engineering o nd economic asp ures over last de story in local and s in Europe and modern technolo and research uctures built ove onomy, flood pro- ems in society, g uction materials	ilding materials on s uction ver last centuries, n bects of selected stru- cades, new technol d global scale other continents. Si ogies of soil improve r last decades, their btection and water n ean, Asiatic and Am global transport issu	ew technologie uctures over th ogies, spectact gnifficance and ment and their r influence on s nanagement in erican continer es, logistics in ies.	es and their ne world ular structur d modern te r impact on society, envi chosen cou nts over last large scale.	impact o res and tl echnologi environn ironment untries, co t decades History o	heir es nent. ;, ase s. The	-	4 3 4 4 6
C-1 C-2 Course co T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 T-W-7	To show impact of environment and ir ontent divided into Crucial developmen built environment. Progress of concret impact on economy Bridges as crucial s discussed on case Geotechnical engir Development of so Massive hydrotech local and in larger studies Roads infrastructur role of communicat implementation ne	nowledg crucial te ndustry. <i>various</i> nts in civ Social an te structur studies structure studies nical stru scale ecc re develo tion syste w constructure chnologie	echnologiies, bu s forms of instr vil engineering o nd economic asp ures over last de story in local and is in Europe and modern technolo g and research uctures built ove poment in Europe ems in society, g ruction materials es used as meth	ilding materials on s uction ver last centuries, n bects of selected stru- cades, new technol global scale other continents. Si ogies of soil improve r last decades, their bection and water n ean, Asiatic and Am global transport issu s and new technolog	ew technologie uctures over th ogies, spectact gnifficance and ment and their r influence on s nanagement in erican continer es, logistics in ies.	es and their ne world ular structur d modern te r impact on society, envi chosen cou nts over last large scale.	impact o res and tl echnologi environn ironment untries, co t decades History o	n Νι heir es nent. ;, ase s. The of	-	4 3 4 4 6 6 3
C-1 C-2 Course co T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 T-W-7	To show impact of environment and ir ontent divided into Crucial developmen built environment. Progress of concret impact on economy Bridges as crucial s discussed on case Geotechnical engir Development of so Massive hydrotech local and in larger studies Roads infrastructur role of communical implementation ne	nowledg crucial te ndustry. <i>Various</i> nts in civ Social ar te structure studies neering, r il testing nical stru scale ecc re develo tion syst w constr chnologie	echnologiies, bu s forms of instr vil engineering o nd economic asp ures over last de story in local and is in Europe and modern technolo g and research uctures built ove poment in Europe ems in society, g ruction materials es used as meth	ilding materials on s uction ver last centuries, n bects of selected stru- cades, new technol global scale other continents. Si ogies of soil improve r last decades, their otection and water n ean, Asiatic and Am global transport issu s and new technolog	ew technologie uctures over th ogies, spectact gnifficance and ment and their r influence on s nanagement in erican continer es, logistics in ies.	es and their ne world ular structur d modern te r impact on society, envi chosen cou nts over last large scale.	impact o res and tl echnologi environn ironment untries, co t decades History o	n Νι heir es nent. ;, ase s. The of	umber of	4 3 4 4 6 6 3
C-1 C-2 Course co T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 T-W-7 Student v	To show impact of environment and ir ontent divided into Crucial development built environment. Progress of concrete impact on economy Bridges as crucial se discussed on case Geotechnical engine Development of so Massive hydrotech local and in larger studies Roads infrastructur role of communical implementation ne Steel structures tech workload - forms of	rowledg crucial te ndustry. <i>various</i> nts in civ Social ar te structure studies neering, r il testing nical stru scale ecc re develct tion syst chnologie <i>activity</i> ures	echnologiies, bu s forms of instr (il engineering o nd economic asp ures over last de story in local and s in Europe and modern technolo and research uctures built ove ponomy, flood pro- poment in Europo ems in society, g es used as meth	ilding materials on s uction ver last centuries, n bects of selected stru- cades, new technol d global scale other continents. Si ogies of soil improve r last decades, their bection and water n ean, Asiatic and Am global transport issu s and new technolog od of civil engineeri	ew technologie uctures over th ogies, spectact gnifficance and ment and their r influence on s nanagement in erican continer es, logistics in ies.	es and their ne world ular structur d modern te r impact on society, envi chosen cou nts over last large scale.	impact o res and tl echnologi environn ironment untries, co t decades History o	n Νι heir es nent. ;, ase s. The of	umber of	4 3 4 4 6 6 3 1 hours
C-1 C-2 Course co T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 T-W-6 T-W-7 Student v A-W-1 A-W-2 A-W-3	To show impact of environment and ir ontent divided into Crucial development built environment. Progress of concrete impact on economy Bridges as crucial se discussed on case Geotechnical engine Development of so Massive hydrotech local and in larger studies Roads infrastructur role of communical implementation ne Steel structures tee workload - forms of Attendance on lect Desk study support Consultancies and	nowledg crucial te ndustry. <i>Various</i> nts in civ Social ar te structure studies neering, r il testing nical stru scale ecc re develo tion syst w constr chnologie <i>activity</i> ures ted by lit discussio	echnologiies, bu s forms of instr vil engineering o nd economic asp ures over last de story in local and s in Europe and modern technolo and research uctures built ove ponomy, flood pro- poment in Europp ems in society, g cuction materials es used as meth v cerature and inter ons	ilding materials on s uction ver last centuries, n bects of selected stru- cades, new technol d global scale other continents. Si ogies of soil improve r last decades, their bection and water n ean, Asiatic and Am global transport issu s and new technolog od of civil engineeri	ew technologie uctures over th ogies, spectact gnifficance and ment and their r influence on s nanagement in erican continer es, logistics in ies.	es and their ne world ular structur d modern te r impact on society, envi chosen cou nts over last large scale.	impact o res and tl echnologi environn ironment untries, co t decades History o	n Νι heir es nent. ;, ase s. The of	umber of	4 3 4 6 6 3 <i>hours</i> 30 15 5
C-1 C-2 Course co T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 T-W-6 T-W-7 Student v A-W-1 A-W-1 A-W-2 A-W-3 A-W-4	To show impact of environment and ir ontent divided into Crucial development built environment. Progress of concrete impact on economy Bridges as crucial se discussed on case Geotechnical engine Development of so Massive hydrotech local and in larger studies Roads infrastructur role of communicate implementation ne Steel structures tee workload - forms of Attendance on lect Desk study support Consultancies and Preparations to pase	nowledg crucial te ndustry. <i>various</i> nts in civ Social ar te structure studies neering, r il testing nical stru scale ecc re develct tion syste w constr chnologie <i>activity</i> ures ted by lit discussio	echnologiies, bu s forms of instr (il engineering o nd economic asp ures over last de story in local and s in Europe and modern technolo and research uctures built ove poment in Europe ems in society, g end in society, g cuction materials es used as meth (cerature and inter odule	ilding materials on s uction ver last centuries, n bects of selected stru- cades, new technol d global scale other continents. Si ogies of soil improve r last decades, their bection and water n ean, Asiatic and Am global transport issu s and new technolog od of civil engineeri	ew technologie uctures over th ogies, spectact gnifficance and ment and their r influence on s nanagement in erican continer es, logistics in ies.	es and their ne world ular structur d modern te r impact on society, envi chosen cou nts over last large scale.	impact o res and tl echnologi environn ironment untries, co t decades History o	n Νι heir es nent. ;, ase s. The of	umber of	4 3 4 6 6 3 6 3 1 5 5 7
C-1 C-2 Course co T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 T-W-6 T-W-7 Student v A-W-1 A-W-2 A-W-3	To show impact of environment and ir ontent divided into Crucial development built environment. Progress of concrete impact on economy Bridges as crucial se discussed on case Geotechnical engine Development of so Massive hydrotech local and in larger studies Roads infrastructur role of communical implementation ne Steel structures tee workload - forms of Attendance on lect Desk study support Consultancies and	nowledg crucial te ndustry. <i>various</i> nts in civ Social ar te structure studies neering, r il testing nical stru scale ecc re develct tion syste w constr chnologie <i>activity</i> ures ted by lit discussio	echnologiies, bu s forms of instr (il engineering o nd economic asp ures over last de story in local and s in Europe and modern technolo and research uctures built ove poment in Europe ems in society, g end in society, g cuction materials es used as meth (cerature and inter odule	ilding materials on s uction ver last centuries, n bects of selected stru- cades, new technol d global scale other continents. Si ogies of soil improve r last decades, their bection and water n ean, Asiatic and Am global transport issu s and new technolog od of civil engineeri	ew technologie uctures over th ogies, spectact gnifficance and ment and their r influence on s nanagement in erican continer es, logistics in ies.	es and their ne world ular structur d modern te r impact on society, envi chosen cou nts over last large scale.	impact o res and tl echnologi environn ironment untries, co t decades History o	n Νι heir es nent. ;, ase s. The of	umber of	4 3 4 6 6 3 <i>hours</i> 30 15 5
C-1 C-2 Course co T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 T-W-7 Student v A-W-1 A-W-1 A-W-2 A-W-3 A-W-4 A-W-5 Teaching	To show impact of environment and ir ontent divided into Crucial development built environment. Progress of concreted impact on economy Bridges as crucial sed discussed on cases Geotechnical engine Development of so Massive hydrotech local and in larger studies Roads infrastructur role of communicated implementation ne Steel structures teet workload - forms of Attendance on lect Desk study support Consultancies and Preparations to pase Oral completion of	nowledg crucial te ndustry. <i>Various</i> nts in civ Social ar te structure studies neering, r il testing nical struc scale ecc re develo tion syste w constr chnologie <i>activity</i> ures ted by lit discussio as the mo	echnologiies, bu s forms of instr (il engineering o nd economic asp ures over last de story in local and s in Europe and modern technolo g and research uctures built ove onomy, flood pro- pems in society, g uction materials es used as meth (cerature and inter odule ect	ilding materials on s uction ver last centuries, n bects of selected stru- cades, new technol d global scale other continents. Si ogies of soil improve r last decades, their bection and water n ean, Asiatic and Am global transport issu s and new technolog od of civil engineeri	ew technologie uctures over th ogies, spectact gnifficance and ment and their r influence on s nanagement in erican continer es, logistics in ies.	es and their ne world ular structur d modern te r impact on society, envi chosen cou nts over last large scale.	impact o res and tl echnologi environn ironment untries, co t decades History o	n Νι heir es nent. ;, ase s. The of	umber of	4 3 4 6 6 3 6 3 1 5 5 7
C-1 C-2 Course co T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 T-W-7 Student v A-W-1 A-W-2 A-W-3 A-W-4 A-W-5	To show impact of environment and ir ontent divided into Crucial development built environment. Progress of concrete impact on economy Bridges as crucial se discussed on case Geotechnical engine Development of so Massive hydrotech local and in larger studies Roads infrastructur role of communicat implementation ne Steel structures tee workload - forms of Attendance on lect Desk study support Consultancies and Preparations to pass Oral completion of	nowledg crucial te ndustry. <i>Various</i> nts in civ Social ar te structure studies neering, r il testing nical struc scale ecc re develo tion syste w constr chnologie <i>activity</i> ures ted by lit discussio as the mo	echnologiies, bu s forms of instr (il engineering o nd economic asp ures over last de story in local and s in Europe and modern technolo g and research uctures built ove onomy, flood pro- pems in society, g uction materials es used as meth (cerature and inter odule ect	ilding materials on s uction ver last centuries, n bects of selected stru- cades, new technol d global scale other continents. Si ogies of soil improve r last decades, their bection and water n ean, Asiatic and Am global transport issu s and new technolog od of civil engineeri	ew technologie uctures over th ogies, spectact gnifficance and ment and their r influence on s nanagement in erican continer es, logistics in ies.	es and their ne world ular structur d modern te r impact on society, envi chosen cou nts over last large scale.	impact o res and tl echnologi environn ironment untries, co t decades History o	n Νι heir es nent. ;, ase s. The of	umber of	4 3 4 6 6 3 6 3 1 5 5 7
C-1 C-2 Course co T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 T-W-7 Student v A-W-1 A-W-1 A-W-2 A-W-3 A-W-4 A-W-5 Teaching M-1	To show impact of environment and ir ontent divided into Crucial development built environment. Progress of concreted impact on economy Bridges as crucial sed discussed on cases Geotechnical engine Development of so Massive hydrotech local and in larger studies Roads infrastructur role of communicated implementation ne Steel structures teet workload - forms of Attendance on lect Desk study support Consultancies and Preparations to pase Oral completion of	nowledg crucial te ndustry. <i>various</i> nts in civ Social ar te structure studies neering, r il testing nical stru- scale ecco re develo tion syste w constr chnologie ted by lit discussio s the mo- the subjo	echnologiies, bu	ilding materials on s uction ver last centuries, n bects of selected stru- cades, new technol d global scale other continents. Si ogies of soil improve r last decades, their bection and water n ean, Asiatic and Am global transport issu s and new technolog od of civil engineeri	ew technologie uctures over th ogies, spectact gnifficance and ment and their r influence on s nanagement in erican continer es, logistics in ies.	es and their ne world ular structur d modern te r impact on society, envi chosen cou nts over last large scale.	impact o res and tl echnologi environn ironment untries, co t decades History o	n Νι heir es nent. ;, ase s. The of	umber of	4 3 4 6 6 3 6 3 1 5 5 7
C-1 C-2 Course co T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 T-W-7 Student v A-W-1 A-W-1 A-W-2 A-W-3 A-W-4 A-W-5 Teaching M-1	To show impact of environment and ir ontent divided into Crucial development built environment. Progress of concrete impact on economy Bridges as crucial se discussed on cases Geotechnical engine Development of so Massive hydrotech local and in larger studies Roads infrastructur role of communicate implementation ne Steel structures tee workload - forms of Attendance on lect Desk study support Consultancies and Preparations to pase Oral completion of methods / tools Iecture with proble	nowledg crucial te ndustry. <i>various</i> nts in civ Social ar te structure studies neering, r il testing nical stru- scale ecc re develo tion syste chnologie ted by lit discussio as the mo- the subj m metho gressive	echnologiies, bu s forms of instr vil engineering o nd economic asp ures over last de story in local and s in Europe and modern technolog and research uctures built ove onomy, flood pro- pement in Europe ems in society, g uction materials es used as meth v cerature and inter odule ect	ilding materials on s uction ver last centuries, n bects of selected stru- cades, new technol d global scale other continents. Si ogies of soil improve r last decades, their bection and water n ean, Asiatic and Am global transport issu s and new technolog od of civil engineeri	ew technologie uctures over th ogies, spectact gnifficance and ment and their r influence on s nanagement in erican continer es, logistics in ies.	es and their ne world ular structur d modern te r impact on society, envi chosen cou nts over last large scale.	impact o res and tl echnologi environn ironment untries, co t decades History o	n Νι heir es nent. ;, ase s. The of	umber of	4 3 4 6 6 3 <i>hours</i> 30 15 5 7

Knowledge							
B-A_2A_A/A/02-2_W01 Student has knowledge on developments in civil engineering from various field in construction industry, knows the main aspects of crucial achievements over last centuries with additional knowledge on economical, social, environmental impact of used technologies and materials over years	B-A_2A_W05 B-A_2A_W07 B-A_2A_W13 B-A_2A_W14	P7S_WG_TA21 P7S_WK_TA21	C-1 C-2	T-W-1 T-W-2 T-W-3 T-W-4	T-W-5 T-W-6 T-W-7	M-1	S-1
Skills							
B-A_2A_A/A/02-2_U01 Student is able to estimate complex civil engineering tasks from historical, social, environmental and economical perspective and analyse contemporary trends in civil engineering from historical and crucial achievements.	B-A_2A_U14 B-A_2A_U16 B-A_2A_U26	P7S_UU P7S_UW_TA24	C-1 C-2	T-W-1 T-W-2 T-W-3 T-W-4	T-W-5 T-W-6 T-W-7	M-1	S-1
Other social / personal competences							
B-A_2A_A/A/02-2_K01 Student understands the infuence of civil engineering activity on society, economy, environment from historical perspective with reference to discussed case studies.	B-A_2A_K03 B-A_2A_K04 B-A_2A_K09	P7S_KK P7S_KR	C-1 C-2	T-W-1 T-W-2 T-W-3 T-W-4	T-W-5 T-W-6 T-W-7	M-1	S-1
Required reading							
1. Literature Base Knovel, Civil Engineering and Construct	ion Materials						

				-	-			
Field of st	udy		Civil E	Engineering				
Mode of s	tudy		statio	nary	Level	second cycle		
Graduate'	's qualif	ication	magis	ster			WBi/	\
Area(s) of	•			techniczne			vvDI/	٦.
Education	,	le	gener	ral academic				
Module			gene				-	
Course un	,it		рцс	- History of Ar	chitocturo		-	
Code	111			-	chitecture		-	
			WBIA	/S2CE/A/03-3			- \	
Field of sp								
Administe	ering fac	culty		lra Historii i Teo	-			
ECTS			2,0		ECTS (forms)	2,0	_	
Form of co	ourse ci	redit	credit	S	Language	english		
Electives			3		Elective group			
Form of in	nstructio	on	Code	Semester	Hours	ECTS	Weight	Credit
lecture			W	1	30	2,0	1,00	credits
Leading te	eacher		Arlet	Joanna (arlet@z	ut edu pl)			<u> </u>
Other tea					(zbigniew.paszkov	vski@amail.com)		
			1 0528					
Prerequisi		uisite inferr	atis-	n biston, ant bit	m, and ancle to at			
W-1				n history, art histo	bry and architecture	at the high school leve	l is required.	
Module/co		nit objective			·			
C-1					s in European and Po acteristic features.	blish architecture from	antiquity to mode	ern times.
C-2	-					ysis and graphic devel	opment of boards	in the field
Course co	ntent d	ivided into	variou	s forms of instru	uction			Number of hours
T-W-1					he main architectura	al rules		2
T-W-2	Romar	esque archit	tecture	in Europe and in	Poland. Main objects	and their features.		2
T-W-3	Gothic	architecture	in Eur	ope. The main exa	amples and features	of the style.		2
T-W-4	Gothic	architecture	e in Pola	and. Characteristic	plans of medieval c	ities and villages.		2
T-W-5	Renais	sance in Eur	ope. Ba	ackground of epoc	h, features of style,	the most prominent cre	eators.	2
T-W-6				mous creators and				2
T-W-7		ie in Europe, ie period.	backg	rround of the epo	ch, buildings and the	ir creators. Urban plan	ning of the	2
T-W-8	Baroqu	ie in Poland,	backgr	ound of the epoch	n, buildings and their	r creators.		2
T-W-9				main architects ar				2
T-W-10						m of the Classicism pe	riod.	2
T-W-11					innings of contempo			2
T-W-12	archite		first na	if of the twentietr	n century. Modernish	n, Expressionism, Inter	national Style of	2
T-W-13	Conter	nporary arch	nitectur	e in Europe, main	trends and their cre	ators.		2
T-W-14	Conter	nporary arch	nitectur	e in Poland.				2
T-W-15	Passing	g lectures.						2
Student w	orkload	l - forms of	activit	ty				Number of hours
A-W-1	manda	tory particip	ation ir	n lectures.				30
A-W-2	-	-		m the lecture.				20
A-W-3	Prepar	ing the boar	d on a s	selected topic in t	he field of lectures.			10
Teaching								
M-1	Inform	ative lecture	with m	nultimedia present	tation/a computer wi	th a multimedia projec	tor.	
	n metho		-	/e, P - final)				
S-1	F		-	-		elected topic, based on	literature and da	atabases.
5-2	Р	Students ar	e requi	red to pass the fir	nal colloquium.			

Designed learning outcomes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course content	Teaching methods	Evaluatior methods
Knowledge							
B-A_2A_A/A/02-3_W16 Students understands main styles in history of architecture. Students knows the basic terminlogy of architecture and culture.	B-A_2A_W14 B-A_2A_W16	P7S_WK_TA21	P75_WG_IA21 P75_WK_IA21	C-1 C-2	T-W-1 T-W-9 T-W-2 T-W-10 T-W-3 T-W-11 T-W-4 T-W-12 T-W-5 T-W-13 T-W-6 T-W-14 T-W-7 T-W-15 T-W-8 T-W-15	M-1	S-1 S-2
Skills							
B-A_2A_A/A/02-3_U01 Student is able to obtain information from literature, data bases, integrate and interpret it	B-A_2A_U01	P75_UK		C-1 C-2	T-W-1 T-W-9 T-W-2 T-W-10 T-W-3 T-W-11 T-W-4 T-W-12 T-W-5 T-W-13 T-W-6 T-W-13 T-W-7 T-W-15 T-W-8 T-W-15	M-1	S-1 S-2
B-A_2A_A/A/02-3_U05 The student develops the possibilities of self-education.	B-A_2A_U05	P7S_UU		C-1 C-2	T-W-1 T-W-9 T-W-2 T-W-10 T-W-3 T-W-11 T-W-4 T-W-12 T-W-5 T-W-13 T-W-6 T-W-14 T-W-7 T-W-15 T-W-8	M-1	S-1 S-2
Other social / personal competences							
B-A_2A_A/A/02-3_K02 Student is responsibile and knows how to cooperate with the team.	B-A_2A_K02	P75_KK		C-1 C-2	T-W-1 T-W-9 T-W-2 T-W-10 T-W-3 T-W-11 T-W-4 T-W-12 T-W-5 T-W-13 T-W-6 T-W-14 T-W-7 T-W-15 T-W-8	M-1	S-1 S-2
Required reading							
1. Watkin David, A History of Western Architecture, Laur	ence King Publis	hers, Universi	ty of Michigan	, 2005,	ISBN 18566945	593	
 Nicolaus Pevsner, An outline of European Architecture Adam Miłobędzki, The Architecture of Poland. A chapte 		-					
Supplementary reading		-					
1. Keneeth Frampton, Modern Architecture: A critical His	tory, World of Ar	t., Oxford Univ	versity Press.	1980			
2. Owen Hopkins, Architectural styles a visual quide., La	-		-				

Field of s							
i ieiu oi s	study	Civil E	Ingineering				
Mode of	study	statio	nary	Level	second cycle		
Graduate	e's qualification	magis	ter	-		WBiA	7
Area(s) c		nauki	techniczne			VVD1/	`
	nal profile	aener	al academic				
Module		gene				-	
Course u	nit	рцс	History of Er	ngineering Stru	turos	-	
	////L		2	igineering struc	luies	-	
Code	. ,. ,.	WBIA/	/S2CE/A/03-4			- \	
	specialisation					- \ II	
	tering faculty		d Teorii Konstru	-			
ECTS		2,0		ECTS (forms)	2,0		
Form of a	course credit	credit	S	Language	english		
Electives	5	3		Elective group			
Form of i	instruction	Code	Semester	Hours	ECTS	Weight	Credit
lecture		w	1	30	2,0	1,00	credits
Leading	teacher	Paczk	owski Wiesław	 (Wieslaw.Paczkov		-	
					bramowicz@zut.edu	nl) Visiting Prof	essor
Other tea	achers				asz (Tomasz.Wroble		
Prerequi	sites						
W-1	Strength of materia	als					
W-2	Macanny timber o						
	Masonry, timber, c	oncrete	and steel structi	ures			
Module/c	course unit objectiv			ures			
Module/c C-1	course unit objectiv Presentation of his development of the	<i>es</i> torical d e theory	levelopment of d	lifferent types of sru	ctures using basic sche s of constructions, prob		
	Course unit objective Presentation of his development of the accompaning given	es torical d e theory n type o	levelopment of d , typical and out f structure.	lifferent types of sru standing realization		plems of erection a	nd other problems
C-1 C-2	Course unit objective Presentation of his development of the accompaning given Presentation of stru	es torical d e theory n type o uctural f	levelopment of d v, typical and out f structure. failures and othe	lifferent types of sru standing realization r drawbacks display	s of constructions, prob	plems of erection a	nd other problems rocess
C-1 C-2	Course unit objective Presentation of his development of the accompaning given Presentation of stru- content divided into	es torical d e theory n type o uctural f variou	levelopment of d r, typical and outs f structure. failures and other s forms of instr	lifferent types of sru standing realization r drawbacks display ruction	s of constructions, prob ed during the erection	plems of erection a	nd other problems
C-1 C-2 Course c	Course unit objective Presentation of his development of the accompaning given Presentation of stru- content divided into	es torical d e theory n type o uctural f <i>variou</i> pects of	levelopment of d r, typical and outs f structure. failures and other s forms of instr building activity	lifferent types of sru standing realization r drawbacks display	s of constructions, prob ed during the erection	plems of erection a	nd other problems rocess Number of hours
C-1 C-2 Course c T-W-1	Course unit objective Presentation of his development of the accompaning giver Presentation of stru- content divided into Social and legal as	es torical d e theory n type o uctural f <i>variou</i> pects of nade str	levelopment of d r, typical and outs f structure. failures and other s forms of instr building activity	lifferent types of sru standing realization r drawbacks display ruction	s of constructions, prob ed during the erection	plems of erection a	nd other problems rocess Number of hours 2
C-1 C-2 Course c T-W-1 T-W-2	Course unit objective Presentation of his development of the accompaning given Presentation of stru- content divided into Social and legal as Natural and man-m	es torical d e theory n type o uctural f variou pects of nade str	levelopment of d r, typical and outs f structure. failures and other s forms of instr building activity	lifferent types of sru standing realization r drawbacks display ruction	s of constructions, prob ed during the erection	plems of erection a	nd other problems process Number of hours 2 1
C-1 C-2 Course c T-W-1 T-W-2 T-W-3	Course unit objective Presentation of his development of the accompaning giver Presentation of stru- content divided into Social and legal as Natural and man-m Acient construction	es torical d e theory n type o uctural f variou. pects of nade str ns	levelopment of d r, typical and outs f structure. failures and other s forms of instr building activity uctural forms	lifferent types of sru standing realization r drawbacks display <i>ruction</i> r in historical proces	s of constructions, prob ed during the erection	plems of erection a	nd other problems rocess Number of hours 2 1 2
C-1 C-2 Course c T-W-1 T-W-2 T-W-3 T-W-4	Course unit objective Presentation of his development of the accompaning given Presentation of stru- content divided into Social and legal as Natural and man-m Acient construction Sanctuary construct	es torical d e theory n type o uctural f variou. pects of nade str ns ctions ng struc	levelopment of d r, typical and outs f structure. failures and other s forms of instr building activity uctural forms	lifferent types of sru standing realization r drawbacks display <i>ruction</i> r in historical proces	s of constructions, prob ed during the erection	plems of erection a	nd other problems rocess Number of hours 2 1 2 2 2
C-1 C-2 Course c T-W-1 T-W-2 T-W-3 T-W-4 T-W-5	Course unit objective Presentation of his development of the accompaning given Presentation of stru- content divided into Social and legal as Natural and man-m Acient construction Sanctuary construct Bridges - the leadin	es torical d e theory n type o uctural f variou. pects of nade str ns ctions ng struc ngs	levelopment of d r, typical and outs f structure. failures and other s forms of instr building activity uctural forms	lifferent types of sru standing realization r drawbacks display <i>ruction</i> r in historical proces	s of constructions, prob ed during the erection	plems of erection a	nd other problems rocess Number of hours 2 1 2 2 2 4
C-1 C-2 Course c T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 T-W-6 T-W-7 T-W-8	Course unit objective Presentation of his development of the accompaning giver Presentation of stru- content divided into Social and legal as Natural and man-m Acient construction Sanctuary construct Bridges - the leadin Medium-rise buildin	es torical d e theory n type o uctural f variou. pects of nade str ns ctions ng struc ngs	levelopment of d r, typical and outs f structure. failures and other s forms of instr building activity uctural forms	lifferent types of sru standing realization r drawbacks display <i>ruction</i> r in historical proces	s of constructions, prob ed during the erection	plems of erection a	nd other problems rocess Number of hours 2 1 2 2 2 4 2 4 2
C-1 C-2 Course c T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-5 T-W-6 T-W-7 T-W-8 T-W-9	Course unit objective Presentation of his development of the accompaning given Presentation of stru- content divided into Social and legal as Natural and man-m Acient construction Sanctuary construct Bridges - the leadin Medium-rise buildings Towers and masts	es torical d e theory n type o uctural f variou. pects of nade str ns ctions ng struc ngs	levelopment of d r, typical and outs f structure. failures and other <i>s forms of instr</i> building activity uctural forms tures in innovatio	lifferent types of sru standing realization r drawbacks display <i>ruction</i> r in historical proces	s of constructions, prob ed during the erection s	plems of erection a	nd other problems rocess Number of hours 2 1 2 2 2 4 2 4 2 4 4
C-1 C-2 Course c T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-5 T-W-6 T-W-7 T-W-8 T-W-9 T-W-9 T-W-10	Course unit objective Presentation of his development of the accompaning given Presentation of stru- content divided into Social and legal as Natural and man-m Acient construction Sanctuary construct Bridges - the leadin Medium-rise buildings Towers and masts Lettice shell struct Hydrotechnical stru	es torical d e theory n type o uctural f variou. pects of nade str ns ctions ng struc ngs ure of th uctures	levelopment of d r, typical and outs f structure. failures and other s forms of instr building activity uctural forms tures in innovation	ifferent types of sru standing realization r drawbacks display <i>ruction</i> r in historical proces on developments er in Moscow - case s	s of constructions, prob ed during the erection s	plems of erection a	nd other problems rocess Number of hours 2 1 2 2 2 2 2 4 2 2 4 2 2 2 4 2 2 2 1 2 2 2 1 1 1 1
C-1 C-2 Course c T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 T-W-7 T-W-6 T-W-7 T-W-8 T-W-9 T-W-10 T-W-11	Course unit objective Presentation of his development of the accompaning giver Presentation of stru- content divided into Social and legal as Natural and man-m Acient construction Sanctuary construct Bridges - the leadin Medium-rise buildings Towers and masts Lettice shell structure Hydrotechnical structure	es torical d e theory n type o uctural f variou. pects of nade str ns ctions ng struc ngs ure of th uctures es: indus	levelopment of d r, typical and outs f structure. failures and other s forms of instr building activity uctural forms tures in innovation	lifferent types of sru standing realization r drawbacks display <i>ruction</i> r in historical proces on developments	s of constructions, prob ed during the erection s	plems of erection a	nd other problems rocess Number of hours 2 1 2 2 4 2 4 2 4 2 1 1 1 1 3 3
C-1 C-2 Course c T-W-1 T-W-2 T-W-3 T-W-3 T-W-3 T-W-5 T-W-5 T-W-5 T-W-5 T-W-5 T-W-5 T-W-6 T-W-7 T-W-8 T-W-9 T-W-10 T-W-11 T-W-12	Course unit objective Presentation of his development of the accompaning given Presentation of stru- content divided into Social and legal as Natural and man-m Acient construction Sanctuary construct Bridges - the leadin Medium-rise buildings Towers and masts Lettice shell structure Hydrotechnical structure Letticed space fram	es torical d e theory n type o uctural f variou: pects of nade str ns ctions ng struc ngs ure of th uctures es: indus nes	levelopment of d r, typical and outs f structure. failures and other s forms of instr building activity uctural forms tures in innovation he Shukhov Towe	lifferent types of sru standing realization r drawbacks display <i>ruction</i> r in historical proces on developments er in Moscow - case s	s of constructions, prob ed during the erection s	plems of erection a	nd other problems rocess Number of hours 2 1 2 2 2 2 4 4 2 2 4 4 2 2 1 1 1 3 3 1 1
C-1 C-2 Course c T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-5 T-W-5 T-W-6 T-W-7 T-W-6 T-W-7 T-W-8 T-W-9 T-W-10 T-W-11 T-W-12 T-W-13	Course unit objective Presentation of his development of the accompaning given Presentation of stru- content divided into Social and legal as Natural and man-m Acient construction Sanctuary construct Bridges - the leadin Medium-rise buildings Towers and masts Lettice shell struct Hydrotechnical stru- Industrial structure Letticed space fram	es torical d e theory n type o uctural f variou. pects of nade str ns ctions ng struc ngs ure of th uctures es: indus nes es and p	levelopment of d r, typical and outs f structure. failures and other s forms of instr building activity uctural forms tures in innovation he Shukhov Towe strial halls, power	ifferent types of sru standing realization r drawbacks display <i>ruction</i> r in historical proces on developments er in Moscow - case s	s of constructions, prob ed during the erection s	plems of erection a	nd other problems rocess Number of hours 2 1 2 2 2 2 2 4 4 2 2 4 4 2 2 4 4 2 1 1 1 3 3 1 1 1 1
C-1 C-2 Course c T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 T-W-5 T-W-6 T-W-7 T-W-6 T-W-7 T-W-8 T-W-9 T-W-10 T-W-11 T-W-12 T-W-13 T-W-14	Course unit objective Presentation of his development of the accompaning given Presentation of stru- content divided into Social and legal as Natural and man-m Acient construction Sanctuary construct Bridges - the leadin Medium-rise buildings Towers and masts Lettice shell structure Hydrotechnical structure Letticed space fran Off-shore structure Failures of enginee	es torical d e theory n type o uctural f variou. pects of nade str ns ctions ng struc ngs ure of th uctures es: indus nes es and po ering stru	levelopment of d r, typical and outs f structure. failures and other s forms of instr building activity uctural forms tures in innovation he Shukhov Towe strial halls, power	lifferent types of sru standing realization r drawbacks display <i>ruction</i> r in historical proces on developments er in Moscow - case s	s of constructions, prob ed during the erection s	plems of erection a	nd other problems rocess Number of hours 2 1 2 2 2 2 4 4 2 2 4 4 2 2 4 1 1 1 3 3 1 1 1 2 1 1 2 1 1 1 2 1 1 1 2 1 1 1 1
C-1 C-2 Course c T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-5 T-W-6 T-W-7 T-W-6 T-W-7 T-W-8 T-W-7 T-W-10 T-W-10 T-W-11 T-W-12 T-W-13 T-W-14 T-W-15	Course unit objective Presentation of his development of the accompaning given Presentation of stru- content divided into Social and legal as Natural and man-m Acient construction Sanctuary construct Bridges - the leadin Medium-rise buildings Towers and masts Lettice shell struct Hydrotechnical stru- Industrial structure Letticed space fran Off-shore structure Failures of enginee Pass test of the lead	es torical d e theory n type o uctural f variou. pects of nade str ns ctions ng struc ngs ure of th uctures es: indus nes es and p ering stru tures	levelopment of d , typical and outs f structure. failures and other <i>s forms of instr</i> building activity uctural forms tures in innovation he Shukhov Tower strial halls, power roblems of inspec- uctures	lifferent types of sru standing realization r drawbacks display <i>ruction</i> r in historical proces on developments er in Moscow - case s	s of constructions, prob ed during the erection s	plems of erection a	nd other problems rocess Number of hours 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
C-1 C-2 Course c T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 T-W-7 T-W-6 T-W-7 T-W-7 T-W-7 T-W-9 T-W-10 T-W-11 T-W-11 T-W-12 T-W-13 T-W-14 T-W-15 Student	Course unit objective Presentation of his development of the accompaning giver Presentation of stru- content divided into Social and legal as Natural and man-m Acient construction Sanctuary construct Bridges - the leadin Medium-rise buildings Towers and masts Lettice shell structure Hydrotechnical stru- Industrial structure Letticed space fran Off-shore structure Failures of enginee Pass test of the lect workload - forms of	es torical d e theory n type o uctural f variou. pects of nade str ns ctions ng struc ng struc ngs ure of th uctures es indus nes es and p tring stru tures	levelopment of d , typical and outs f structure. failures and other <i>s forms of instr</i> building activity uctural forms tures in innovation he Shukhov Tower strial halls, power roblems of inspec- uctures	lifferent types of sru standing realization r drawbacks display <i>ruction</i> r in historical proces on developments er in Moscow - case s	s of constructions, prob ed during the erection s	plems of erection a	nd other problems rocess Number of hours 2 1 2 2 2 2 2 4 4 2 2 4 4 2 2 4 4 2 2 1 1 1 1
C-1 C-2 Course c T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-5 T-W-5 T-W-6 T-W-7 T-W-6 T-W-7 T-W-8 T-W-9 T-W-10 T-W-10 T-W-11 T-W-12 T-W-13 T-W-14 T-W-15 Student A-W-1	Course unit objective Presentation of his development of the accompaning giver Presentation of structure content divided into Social and legal as Natural and man-m Acient construction Sanctuary construct Bridges - the leadin Medium-rise buildings Towers and masts Lettice shell structure Hydrotechnical structure Industrial structure Failures of enginee Pass test of the lecture Workload - forms of Presence on lecture	es torical d e theory n type o uctural f variou. pects of nade str ns ctions ng struc- ngs ure of th uctures es: indus nes es and p ering stru- tures	levelopment of d , typical and outs f structure. failures and other <i>s forms of instr</i> building activity uctural forms tures in innovation he Shukhov Tower strial halls, power roblems of inspec- uctures	lifferent types of sru standing realization r drawbacks display <i>ruction</i> r in historical proces on developments er in Moscow - case s	s of constructions, prob ed during the erection s	plems of erection a	nd other problems rocess Number of hours 2 1 2 2 2 2 2 2 2 2 2 2 2 2 3 3 1 1 3 3 1 1 1 2 2 3 1 1 1 2 2 2 2
C-1 C-2 Course c T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-5 T-W-6 T-W-7 T-W-6 T-W-7 T-W-7 T-W-7 T-W-7 T-W-10 T-W-10 T-W-11 T-W-12 T-W-13 T-W-14 T-W-15 Student A-W-2	Course unit objective Presentation of his development of the accompaning given Presentation of stru- content divided into Social and legal as Natural and man-m Acient construction Sanctuary construct Bridges - the leadin Medium-rise buildings Towers and masts Lettice shell structure Hydrotechnical structure Letticed space fran Off-shore structure Failures of enginee Pass test of the lect workload - forms of Presence on lectur Pass test of the lect	es torical d e theory n type o uctural f variou. pects of nade str ns ttions ng struc ngs ure of th uctures es and pi ring stru tures <i>activit</i> es tures	levelopment of d , typical and outs f structure. failures and other <i>s forms of instr</i> building activity uctural forms tures in innovation he Shukhov Tower strial halls, power roblems of inspec- uctures	lifferent types of sru standing realization r drawbacks display <i>ruction</i> r in historical proces on developments er in Moscow - case s	s of constructions, prob ed during the erection s	plems of erection a	nd other problems rocess Number of hours 2 1 2 2 2 2 2 4 4 2 2 4 4 2 2 4 4 2 2 4 4 2 2 1 1 1 1
C-1 C-2 Course c T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-5 T-W-5 T-W-6 T-W-7 T-W-6 T-W-7 T-W-6 T-W-7 T-W-10 T-W-10 T-W-10 T-W-11 T-W-12 T-W-13 T-W-14 T-W-15 Student A-W-1 A-W-2 A-W-3	Course unit objective Presentation of his development of the accompaning given Presentation of stru- content divided into Social and legal as Natural and man-m Acient construction Sanctuary construct Bridges - the leadin Medium-rise buildings Towers and masts Lettice shell struct Hydrotechnical stru- Industrial structure Letticed space fran Off-shore structure Failures of enginee Pass test of the lect workload - forms of Presence on lectur Pass test of the lect	es torical d e theory n type o uctural f variou. pects of nade str ns ttions ng struc ngs ure of th uctures es and pi ring stru tures <i>activit</i> es tures	levelopment of d , typical and outs f structure. failures and other <i>s forms of instr</i> building activity uctural forms tures in innovation he Shukhov Tower strial halls, power roblems of inspec- uctures	lifferent types of sru standing realization r drawbacks display <i>ruction</i> r in historical proces on developments er in Moscow - case s	s of constructions, prob ed during the erection s	plems of erection a	nd other problems rocess Number of hours 2 1 2 2 2 2 2 2 2 2 2 2 2 2 3 3 1 1 3 3 1 1 1 2 2 3 1 1 1 2 2 2 2
C-1 C-2 Course c T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-5 T-W-6 T-W-7 T-W-6 T-W-7 T-W-7 T-W-7 T-W-10 T-W-10 T-W-10 T-W-10 T-W-11 T-W-12 T-W-13 T-W-13 T-W-14 T-W-15 Student A-W-1 A-W-2 A-W-3 Teaching	Course unit objective Presentation of his development of the accompaning given Presentation of stru- content divided into Social and legal as Natural and man-m Acient construction Sanctuary construct Bridges - the leadin Medium-rise buildings Towers and masts Lettice shell structure Hydrotechnical structure Letticed space fran Off-shore structure Failures of enginee Pass test of the lect workload - forms of Presence on lectur Pass test of the lect Own work of stude	es torical d e theory n type o uctural f variou. pects of nade str ns ttions ng struc ngs ure of th uctures is: indus nes is: and pu tures f activit es tures nt	levelopment of d , typical and outs f structure. failures and other <i>s forms of instr</i> building activity uctural forms tures in innovation ne Shukhov Tower strial halls, power roblems of inspec- uctures <i>y</i>	lifferent types of sru standing realization r drawbacks display <i>ruction</i> r in historical proces on developments er in Moscow - case s	s of constructions, prob ed during the erection s	plems of erection a	nd other problems rocess Number of hours 2 1 2 2 2 2 2 4 4 2 2 4 4 2 2 4 4 2 2 1 1 1 1
C-1 C-2 Course c T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-5 T-W-5 T-W-6 T-W-7 T-W-6 T-W-7 T-W-6 T-W-7 T-W-10 T-W-10 T-W-10 T-W-11 T-W-12 T-W-13 T-W-14 T-W-15 Student A-W-1 A-W-2 A-W-3	Course unit objective Presentation of his development of the accompaning given Presentation of stru- content divided into Social and legal as Natural and man-m Acient construction Sanctuary construct Bridges - the leadin Medium-rise buildings Towers and masts Lettice shell struct Hydrotechnical stru- Industrial structure Letticed space fran Off-shore structure Failures of enginee Pass test of the lect workload - forms of Presence on lectur Pass test of the lect	es torical d e theory n type o uctural f variou. pects of nade str ns ttions ng struc ngs ure of th uctures is: indus nes is: and pu tures f activit es tures nt	levelopment of d , typical and outs f structure. failures and other <i>s forms of instr</i> building activity uctural forms tures in innovation ne Shukhov Tower strial halls, power roblems of inspec- uctures <i>y</i>	lifferent types of sru standing realization r drawbacks display <i>ruction</i> r in historical proces on developments er in Moscow - case s	s of constructions, prob ed during the erection s	plems of erection a	nd other problems rocess Number of hours 2 1 2 2 2 2 2 4 4 2 2 4 4 2 2 4 4 2 2 1 1 1 1
C-1 C-2 Course c T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-5 T-W-6 T-W-7 T-W-6 T-W-7 T-W-7 T-W-7 T-W-10 T-W-10 T-W-10 T-W-11 T-W-12 T-W-13 T-W-14 T-W-15 Student A-W-1 A-W-2 A-W-3 Teaching M-1	Course unit objective Presentation of his development of the accompaning given Presentation of stru- content divided into Social and legal as Natural and man-m Acient construction Sanctuary construct Bridges - the leadin Medium-rise buildings Towers and masts Lettice shell structure Hydrotechnical structure Letticed space fran Off-shore structure Failures of enginee Pass test of the lect workload - forms of Presence on lectur Pass test of the lect Own work of stude	es torical d e theory n type o uctural f variou. pects of nade str ns ctions ng struc ngs ure of th uctures es and p ering stru tures factivit es tures nt	levelopment of d , typical and outs f structure. failures and other s forms of instr building activity uctural forms tures in innovation ne Shukhov Tower strial halls, power roblems of inspec- uctures y	lifferent types of sru standing realization r drawbacks display <i>ruction</i> r in historical proces on developments er in Moscow - case s	s of constructions, prob ed during the erection s	plems of erection a	nd other problems rocess Number of hours 2 1 2 2 2 2 2 4 4 2 2 4 4 2 2 4 4 2 2 1 1 1 1

Designed learning outcomes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course content	Teaching methods	Evaluation methods
Knowledge							
CE_2A_A/A/02-4_W01 Student posesses knowledge based on mathematical and mechanical basis of main processes and trends which influenced historical development of engineering structures starting from very early forms and ending with contemporary sophisticated and advanced structures with a clear relation to social, economic, legal and enviromental effects.	B-A_2A_W01 B-A_2A_W05 B-A_2A_W13 B-A_2A_W14	P75_WG_TA21 P75_WK_TA21		C-1 C-2	T-W-1 T-W-9 T-W-2 T-W-10 T-W-3 T-W-11 T-W-4 T-W-12 T-W-5 T-W-13 T-W-6 T-W-14 T-W-7 T-W-15 T-W-8	M-1	S-1
Skills	•	•			•		
CE_2A_A/A/02-4_U01 Student is able to see and understand all aspects of own engineering activity judged on the basis of properly selected sources, also in foreign languages and to interpret contemporary trends of developments in technical and non- technical aspects by comparing with experience coming from historical knowledge.	B-A_2A_U01 B-A_2A_U11 B-A_2A_U13 B-A_2A_U26	P75_UK P75_UO P75_UU P75_UW_TA22 P75_UW_TA23		C-1 C-2	T-W-1 T-W-9 T-W-2 T-W-10 T-W-3 T-W-11 T-W-4 T-W-12 T-W-5 T-W-13 T-W-6 T-W-14 T-W-7 T-W-15 T-W-8	M-1	S-1
Other social / personal competences							
CE_2A_A/A/02-4_K01 Student is aware of importance of his activity for the society and understands technical and non-technical consequences including environmental ones, understands the meaning of sustainable development and importance of continuos development of his professional and personal competences including ability of proper communication with the society.	B-A_2A_K03 B-A_2A_K04 B-A_2A_K06 B-A_2A_K08	P7S_KK P7S_KO P7S_KR		C-1 C-2	T-W-1 T-W-9 T-W-2 T-W-10 T-W-3 T-W-11 T-W-4 T-W-12 T-W-5 T-W-13 T-W-6 T-W-14 T-W-7 T-W-15 T-W-8	M-1	S-1
Required reading							
1. Mainstone R. J., Developments in Structural Form, Tay	lor & Francis Gro	oup, Oxford, 2	001				
2. Heyman J., The Science of Structural Engineering, Imp		ss, London, 19	999				
3. Dowling P. J., Structural Steel design, Butterworths, Lo	ndon, 1998						
Supplementary reading 1. Timoshenko S. P., History of Strength of Materials, Mc	Graw-Hill Book C	ompany, New	York, 1953				

							-				
Field of st	udy	Civil E	Ingineering								
Mode of st	tudy	statio	nary	Level	second	cycle					
Graduate'	s qualification	magis	ster				V	VBiA	4		
Area(s) of	study	nauki	techniczne						`		_
Education	al profile	gener	al academic					- 11			
Module								- 11			
Course un	it	PS - E	Ethics in Busin	ess				- 11		2	
Code		WBIA/	/S2CE/A/04-1					- 11		ΙΠ	
Field of sp	ecialisation										
Administe	ring faculty		ół Dydaktyczny I wnictwie	Ekonomiki, Orga	anizacji i Za	rządzania w			<u> </u>		
ECTS		1,0		ECTS (forms)	1,0						
Form of co	ourse credit	credit	S	Language	english						
Electives		4		Elective group							
Form of in	struction	Code	Semester	Hours		ECTS	We	eight	C	redit	t
lecture		w	3	15		1,0	1	,00	CI	redite	s
Leading te	eacher	Arasz	kiewicz Krystyna	a (Krystyna.Ara	szkiewicz@z	ut.edu.pl)					
Other tead			ng Professor (Vis								
Prerequisi		I	- · ·								
W-1	Knowledge of the b	asics of	feconomics								
Module/co	urse unit objective										
C-1	Getting the knowle		the principles of c	orporate social re	sponsibility a	nd the conce	ot of sus	stainable	develop	ment	
Course co	ntent divided into	-		-					Numbe		
T-W-1	The concept of bus				conomics.				Numbe		1
T-W-2	Subject, objectives	and me	ethods of ethics. E	-		: premises ar	nd ways	to			1
	justify moral choice Ethical dimension of			esis of business e	thics An ente	ernrise as a m	oral ent	ity The			
T-W-3	specificity of ethica	l analys	sis of economic is	sues.				-			2
T-W-4	Competitiveness - o Ethical dimension o	definitio of comp	on and essence, th etition.	ne process of ach	ieving and ma	aintaining con	npetitive	eness.			2
T-W-5	Conflict of economi			•							2
T-W-6	Corporate Social Re example of Polish a			ry, standards, pri	inciples. Good	CSR practice	s on the	9			2
T-W-7	Ethical dimension c company.			agement. Organis	ational cultur	e and social c	apital o	fa			2
T-W-8	Principles of engine	ering e	thics in the practi	ce of design, imp	lementation a	and operation	of tech	nical			2
T-W-9	facilities. Final test										1
	orkload - forms of	activit							Numbe	or of	
A-W-1	Participation in lect		У						warnoe	-1 01	14
A-W-1 A-W-2	Own work, self-stud										15
A-W-3	final test	-									1
Teaching	methods / tools								L		
M-1	Informative lecture	, explar	nation, case studie	es discussion							
Evaluation	n methods (F - prog	gressiv	ve, P - final)								
5-1	P final writter	-									
	Designed learning	g outco	omes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course co		aching ethods	Evaluation methods
Knowledge	9			1			1		I		1
B-A_2A_A/A/0 The student k social respon	knows the assumptions	of the co	oncept of corporate	B-A_2A_W14 B-A_2A_W16	P7S_WK_TA21	P7S_WG_IA21 P7S_WK_IA21	C-1	T-W-2 T T-W-3 T	-W-5 -W-6 -W-7 -W-8	M-1	S-1

B-A_2A_U26	P7S_UU	C-1	T-W-3 T-W-4 T-W-6	T-W-7 T-W-8	M-1	S-1
B-A_2A_K09	P7S_KR	C-1	T-W-1 T-W-2 T-W-3 T-W-4	T-W-5 T-W-6 T-W-7 T-W-8	M-1	S-1
ethics, Berrett-	Koehler, San Franc	isco, 2003				
, OUP, Oxford, 2	010					
g/, 2011						
,	B-A_2A_K09 ethics, Berrett- , OUP, Oxford, 2	B-A_2A_K09 P75_KR ethics, Berrett-Koehler, San Franc , OUP, Oxford, 2010	B-A_2A_K09 P7S_KR C-1 ethics, Berrett-Koehler, San Francisco, 2003 , OUP, Oxford, 2010	B-A_2A_U26 P7S_UU C-1 T-W-4 T-W-6 B-A_2A_K09 P7S_KR C-1 T-W-1 T-W-2 T-W-3 T-W-4 ethics, Berrett-Koehler, San Francisco, 2003	B-A_2A_U26 P7S_UU C-1 T-W-4 T-W-8 B-A_2A_K09 P7S_KR C-1 T-W-1 T-W-5 B-A_2A_K09 P7S_KR C-1 T-W-1 T-W-5 T-W-3 T-W-6 T-W-6 T-W-7 ethics, Berrett-Koehler, San Francisco, 2003 OUP, Oxford, 2010 Image: Comparison of the second sec	B-A_2A_U26 P7S_UU C-1 T-W-4 T-W-8 M-1 B-A_2A_K09 P7S_KR C-1 T-W-1 T-W-5 M-1 B-A_2A_K09 P7S_KR C-1 T-W-2 T-W-6 M-1 ethics, Berrett-Koehler, San Francisco, 2003

Field of s	study	Civil E	Engineering				
Mode of	study	statio		Level	second cycle		
	e's qualification	magis	ster		-	WBi/	\
Area(s) o	•	-	techniczne			VV DIF	1
	nal profile	-	ral academic				
Module		J				1 11	
Course u	ınit	PS -	Ethic and Soci	al Aspects of Ec	onomic Activity	1 11	
Code			/S2CE/A/04-2			1 11	
	specialisation		0202,7,0012				
	ering faculty		ół Dydaktyczny I wnictwie	Ekonomiki, Organ	izacji i Zarządzania w		
ECTS		1,0		ECTS (forms)	1,0		
Form of a	course credit	credit	S	Language	english		
Electives	5	4		Elective group			
Form of i	instruction	Code	Semester	Hours	ECTS	Weight	Credit
lecture		W	3	15	1,0	1,00	credits
Leading	teacher	Δrasz			kiewicz@zut.edu.pl)	,	
Other tea		1032	Riewicz Riystyn		Kiewiez@zut.euu.pi/		
Prerequis W-1	Knowledge of the b	acice o	foconomics				
C-1	Course unit objective Getting to know the conflicts accompan	e most		in the field of econo	mic ethics and arousing t	he attitude of s	ensitivity to moral
C-2		ne princ	iples of corporate	social responsibility	and company relations		
Course c	ontent divided into	variou	s forms of instru	uction			Number of hours
T-W-1	and his role in the	modern	n market economy		nomics. Features of the e		1
T-W-2	justify moral choice	es and j	udgments.		cal systems: premises and		1
T-W-3	specificity of ethica	al analy	sis of economic is	sues.	ics. An enterprise as a mo	-	2
T-W-4	Ethical dimension of	of comp	etition. Utilitarian	ism: corruption, mo			2
T-W-5					th: classic, endogenous, omic dimension of sustair		2
T-W-6	Corporate Social Re			ory, standards. Princ ple of Polish and glo	iples of corporate social r bal companies.	esponsibility in	2
T-W-7	methods and achie	vemen	ts of ethics based		nanagement tool. Assump an responsibilities, the co ble action		2
T-W-8	The ethics of the p	rofessic er profe	on of an engineer i ssional associatio	in the light of the FE ns. Principles of eng	ANI code, the Polish Chai ineering ethics in the pra		2
T-W-9	Final test						1
Student	workload - forms of	activit	ty				Number of hours
A-W-1	Participation in lect		-				14
A-W-2	Own work, self-stud	dy					15
A-W-3	final test						1
Teaching	g methods / tools						•
M-1	Informative lecture	, expla	nation, case studi	es discussion			
Evaluatio	on methods (F - pro	gressiv	/e, P - final)				
S-1	P final writter	-					
ι							

Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course	e content	Teaching methods	Evaluation methods
B-A_2A_W14 B-A_2A_W16	P75_WK_TA21	P7S_WG_IA21 P7S_WK_IA21	C-1 C-2	T-W-1 T-W-2 T-W-3 T-W-4	T-W-5 T-W-6 T-W-7 T-W-8	M-1	S-1
B-A_2A_W14 B-A_2A_W16	P7S_WK_TA21	P7S_WG_IA21 P7S_WK_IA21	C-1 C-2	T-W-5 T-W-6	T-W-7	M-1	S-1
B-A_2A_U26	P7S_UU		C-1 C-2	T-W-1 T-W-2	T-W-3 T-W-4	M-1	S-1
B-A_2A_U26	P7S_UU		C-1 C-2	T-W-3 T-W-4 T-W-6	T-W-7 T-W-8	M-1	S-1
B-A_2A_K09	P7S_KR		C-1 C-2	T-W-1 T-W-2 T-W-3 T-W-4	T-W-5 T-W-6 T-W-7 T-W-8	M-1	S-1
al ethics, Berrett-	Koehler, San F	rancisco, 200	3				
y, OUP, Oxford, 2	010						
rg/, 2011							
	learning outcomes designed for the fields of study	Reference to the learning outcomes designed for the fields of study learning outcomes defined for the particular areas of education A B-A_2A_W14 B-A_2A_W16 P7S_WK_TA21 B-A_2A_W16 P7S_WK_TA21 B-A_2A_U26 P7S_UU B-A_2A_U26 P7S_UU B-A_2A_CO P7S_KR al ethics, Berrett-Koehler, San F Ty, OUP, Oxford, 2010	Reference to the learning outcomes designed for the fields of study learning outcomes defined for the particular areas of education learning outcomes leading to the degree of "inżynier" A B-A_2A_W14 B-A_2A_W16 P7S_WK_TA21 P7S_WG_IA21 P7S_WK_IA21 B-A_2A_W14 B-A_2A_W16 P7S_WK_TA21 P7S_WG_IA21 P7S_WK_IA21 B-A_2A_W16 P7S_WK_TA21 P7S_WG_IA21 P7S_WK_IA21 B-A_2A_W16 P7S_WK_TA21 P7S_WG_IA21 P7S_WK_IA21 B-A_2A_W16 P7S_WK_TA21 P7S_WG_IA21 P7S_WK_IA21 B-A_2A_W16 P7S_WK_TA21 P7S_WG_IA21 P7S_WK_IA21 B-A_2A_U26 P7S_UU Image: mage: mag	Reference to the learning outcomes designed for the fields of study learning outcomes particular areas of education Reference to learning outcomes leading to the degree of "inżynier" Course objectives A B-A_2A_W14 B-A_2A_W16 P7S_WK_TA21 P7S_WG_IA21 P7S_WK_IA21 C-1 C-2 B B-A_2A_W16 P7S_WK_TA21 P7S_WG_IA21 P7S_WK_IA21 C-1 C-2 B B-A_2A_W16 P7S_UU C-1 C-2 B B-A_2A_W16 P7S_UU C-1 C-2 B B-A_2A_W16 P7S_UU C-1 C-2 B B-A_2A_W16 P7S_UU C-1 C-2 B B-A_2A_U26 P7S_UU C-1 C-2 B B-A_2A_U26 P7S_UU C-1 C-2 B B-A_2A_U26 P7S_KR C-1 C-2 B C-1 C-2 C-1 C-2 C-1 C-2 B D D C-1 C-2 B D D C-1 C-2 B D D D B D D D D D D D D D D D D D D	Reference to the learning outcomes designed for the fields of study learning outcomes defined for the particular areas of education Reference to learning outcomes leading to the degree of "inżynier" Course objectives Course A B-A_2A_W14 B-A_2A_W16 P7S_WK_TA21 P7S_WG_IA21 P7S_WK_IA21 C-1 C-2 T-W-1 T-W-2 T-W-3 B-A_2A_W16 P7S_WK_TA21 P7S_WG_IA21 P7S_WK_IA21 C-1 C-2 T-W-5 T-W-6 B-A_2A_W16 P7S_UW P7S_WK_IA21 C-1 C-2 T-W-5 T-W-6 B-A_2A_U26 P7S_UU C-1 C-2 T-W-1 T-W-2 T-W-6 B-A_2A_U26 P7S_UU C-1 C-2 T-W-3 T-W-4 T-W-6 B-A_2A_K09 P7S_KR C-1 C-2 T-W-1 T-W-2 T-W-3 T-W-4 B-A_2A_K09 P7S_KR C-1 C-2 T-W-1 T-W-2 T-W-3 T-W-4	Reference to the learning outcomes study Reference to the parting outcomes education Reference to learning outcomes leading to the degree of "inzynier" Course objectives Course content a B-A_2A_W14 B-A_2A_W16 P7S_WK_TA21 P7S_WG_IA21 P7S_WK_IA21 C-1 C-2 T-W-1 T-W-3 T-W-5 T-W-2 a B-A_2A_W16 P7S_WK_TA21 P7S_WG_IA21 P7S_WK_IA21 C-1 C-2 T-W-1 T-W-3 T-W-7 T-W-6 B-A_2A_W16 P7S_WK_TA21 P7S_WG_IA21 P7S_WK_IA21 C-1 C-2 T-W-7 T-W-6 T-W-7 T-W-6 B-A_2A_W16 P7S_UU C-1 C-2 T-W-1 C-2 T-W-3 T-W-7 T-W-7 T-W-4 B-A_2A_U26 P7S_UU C-1 C-2 T-W-3 T-W-4 T-W-3 T-W-4 T-W-3 T-W-4 B-A_2A_U26 P7S_UU C-1 C-2 T-W-1 C-2 T-W-1 T-W-3 T-W-7 T-W-4 B-A_2A_K09 P7S_KR C-1 C-2 T-W-1 T-W-4 T-W-5 T-W-6 B-A_2A_K09 P7S_KR C-1 C-2 T-W-1 T-W-4 T-W-5 T-W-6 al ethics, Berrett-Koehler, San Francisco, 2003 Y, OUP, Oxford, 2010 Y	Reference to the learning outcomes study Image and the particular areas of education Reference to learning outcomes learning outcomes learning outcomes learning outcomes learning outcomes learning outcomes learning outcomes learning outcomes learning outcomes Course content Teaching methods a B-A_2A_W14 B-A_2A_W16 P75_WK_TA21 P75_WG_IA21 P75_WK_IA21 C-1 C-2 T-W-1 T-W-3 T-W-5 T-W-6 M-1 b B-A_2A_W16 P75_WK_TA21 P75_WG_IA21 P75_WK_IA21 C-1 C-2 T-W-5 T-W-6 M-1 b B-A_2A_W16 P75_WK_TA21 P75_WG_IA21 P75_WK_IA21 C-1 C-2 T-W-5 T-W-6 M-1 b B-A_2A_U26 P75_UU C-1 C-2 T-W-1 T-W-4 T-W-3 T-W-6 M-1 b B-A_2A_U26 P75_UU C-1 C-2 T-W-1 T-W-4 T-W-3 T-W-6 M-1 b B-A_2A_K09 P75_KR C-1 C-2 T-W-1 T-W-4 T-W-5 T-W-6 M-1 al ethics, Berrett-Koehler, San Francisco, 2003 Y, OUP, Oxford, 2010 VUP, Oxford, 2010 VUP VUP VUP VUP

Field of st	tudy	Civil E	Engineering							
Mode of s	study	statio	nary	Level	second	cycle	-			
Graduate'	's qualification	magis	ster	1			۱۸	/Bi/	Δ	
Area(s) of	f study	nauki	techniczne				V	יוסי	<u>۲</u>	
Education	nal profile	gener	al academic				1 🗆			
Module								- 11		
Course ur	nit	Diplo	ma Thesis ES					- 11	비비님	11.
Code			/S2CE/A/05-1					- 11		11
	pecialisation		0202,7,700 1				1	- 11		11
	ering faculty	Dzieka	anat						וווחו	11.
ECTS		20,0		ECTS (forms)	20,0		-			
	ourse credit	credit	· · · · · · · · · · · · · · · · · · ·				_			
	ourse crean	_	5	Language	english		_			
Electives		5		Elective group					1	
Form of in	nstruction	Code	Semester	Hours		ECTS		ight	Crea	it
		PD	3	0		20,0	1,	00	credi	ts
Leading te	eacher	SSB P	rodziekan (Prod	lziekan.SSB@zut.	edu.pl)					
Other tea	achers									
Prerequis	sites									
W-1	all subjects passed	ł								
L	-									
W-2	Basics of Scientific	: Informa	ation passed							
			ation passed							
Module/co	ourse unit objectiv	'es	·	dertake independer	nt research	based work a	at Master	r level		
	ourse unit objectiv to assess the capa creation of compe	<i>es</i> bility of tency to	the student to un use information t	dertake independer	of copyrigh	nt law and pro			. To create al	oility of
Module/co C-1	ourse unit objectiv to assess the capa creation of compe written report on p	<i>es</i> bility of tency to professio	the student to un use information t nal activity, analy	echnics, protection /ses, calculations, d	of copyrighesign proce	nt law and pro	ofessiona	l ethics.		-
Module/cc C-1 C-2	ourse unit objectiv to assess the capa creation of compe written report on p to know basic rule	<i>'es</i> bility of tency to professio s how to	the student to un use information t onal activity, analy use source mate	echnics, protection	of copyrigh esign proce own concl	nt law and pro ess. usions, opinio	ofessiona ons, bein <u>c</u>	al ethics. g an effe	ect of realize	
Module/cc C-1 C-2 C-3	ourse unit objectiv to assess the capa creation of compe written report on p to know basic rule to create an ability	res Ibility of tency to professio s how to r to mak	the student to un use information t anal activity, analy use source mate e a medial preser	echnics, protection yses, calculations, d rial, how to prepare	of copyrighesign proce own conclics coverin	nt law and pro ess. usions, opinio g final thesis a	ofessiona ons, bein <u>c</u>	al ethics. g an effe	ect of realize	
Module/cc C-1 C-2 C-3 C-4 C-5	ourse unit objectiv to assess the capa creation of compe written report on p to know basic rule to create an ability	res ibility of tency to professio s how to r to mak r to prep	the student to un use information to nal activity, analy use source mate e a medial preser pare conclusions a	echnics, protection yses, calculations, d rial, how to prepare ntation from the top and analysis result o	of copyrighesign proce own conclics coverin	nt law and pro ess. usions, opinio g final thesis a	ofessiona ons, bein <u>c</u>	al ethics. g an effe	ect of realize cialisation.	d work.
Module/cc C-1 C-2 C-3 C-4 C-5	ourse unit objectiv to assess the capa creation of compe written report on p to know basic rule to create an ability	res ibility of tency to professio s how to r to mak r to prep variou	the student to un use information to anal activity, analy use source mate e a medial preser pare conclusions a s forms of instru	echnics, protection yses, calculations, d rial, how to prepare ntation from the top and analysis result o uction	of copyrighesign proce own conclics coverin	nt law and pro ess. usions, opinio g final thesis a	ofessiona ons, bein <u>c</u>	al ethics. g an effe	ect of realize	d work.
Module/cc C-1 C-2 C-3 C-4 C-5 Course co T-PD-1	ourse unit objective to assess the capa creation of compe written report on p to know basic rule to create an ability to create an ability ontent divided into Diploma thesis pro	ves ibility of tency to professio s how to v to mak v to prep variou	the student to un use information to onal activity, analy o use source mate e a medial preser pare conclusions a s forms of instru- n, power point pre	echnics, protection yses, calculations, d rial, how to prepare ntation from the top and analysis result o uction	of copyrighesign proce own conclics coverin	nt law and pro ess. usions, opinio g final thesis a	ofessiona ons, bein <u>c</u>	al ethics. g an effe	ect of realize cialisation.	d work. f hours 0
Module/cc C-1 C-2 C-3 C-4 C-5 Course co T-PD-1 Student w	ourse unit objectiv to assess the capa creation of compe written report on p to know basic rule to create an ability to create an ability ontent divided into Diploma thesis pre-	ves ibility of tency to professio s how to v to mak v to prep variou	the student to un use information to onal activity, analy o use source mate e a medial preser pare conclusions a s forms of instru- n, power point pre	echnics, protection yses, calculations, d rial, how to prepare ntation from the top and analysis result o uction	of copyrighesign proce own conclics coverin	nt law and pro ess. usions, opinio g final thesis a	ofessiona ons, bein <u>c</u>	al ethics. g an effe	ect of realize cialisation.	d work. f hours 0 f hours
Module/cc C-1 C-2 C-3 C-4 C-5 Course co T-PD-1	ourse unit objective to assess the capa creation of compe written report on p to know basic rule to create an ability to create an ability ontent divided into Diploma thesis pro	res ibility of tency to professio s how to r to mak r to prep variou. eparation f activit	the student to un use information to onal activity, analy o use source mate e a medial preser pare conclusions a s forms of instru- n, power point pre	echnics, protection yses, calculations, d rial, how to prepare ntation from the top and analysis result o uction	of copyrighesign proce own conclics coverin	nt law and pro ess. usions, opinio g final thesis a	ofessiona ons, bein <u>c</u>	al ethics. g an effe	ect of realize cialisation.	d work. f hours 0
Module/cc C-1 C-2 C-3 C-4 C-5 Course co T-PD-1 Student w A-PD-1	ourse unit objectiv to assess the capa creation of compe written report on p to know basic rule to create an ability to create an ability ontent divided into Diploma thesis pre- workload - forms o Desk study	<i>Yes</i> Ibility of tency to professio s how to y to mak to prep variou eparation f activit	the student to un use information to anal activity, analy o use source mate e a medial preser pare conclusions a s forms of instru- n, power point pre- y	echnics, protection yses, calculations, d rial, how to prepare ntation from the top and analysis result o uction esentation.	of copyrighesign proce own conclics coverin	nt law and pro ess. usions, opinio g final thesis a	ofessiona ons, bein <u>c</u>	al ethics. g an effe	ect of realize cialisation.	d work. f hours 0 f hours 86
Module/cc C-1 C-2 C-3 C-4 C-5 Course co T-PD-1 Student w A-PD-1 A-PD-2	ourse unit objective to assess the capa creation of compe- written report on p to know basic rule to create an ability to create an ability ontent divided into Diploma thesis pro- workload - forms o Desk study Research work on Consultances with Preparation of the of research work, chapters order, fir	res bility of tency to professio s how to r to mak r to prep variou paration f activit given to thesis th sis introd tests, gra al remai	the student to un use information to onal activity, analy o use source mate e a medial preser pare conclusions a s forms of instru- n, power point pre- y ppic utor, discussions duction, assumpti aphs, analysis of rks and conclusion	echnics, protection yses, calculations, d rial, how to prepare ntation from the top and analysis result o uction esentation.	of copyrigh esign proce own concl ics coverin n final thes creation of ests, reseau final thesis	nt law and pro ess. usions, opinio g final thesis sis content. literature rev rch, literature , correction pi	riew, exe Discuss rocedure	cution sion on c, final	ect of realize cialisation.	d work. f hours 0 f hours 86 145
Module/cc C-1 C-2 C-3 C-4 C-5 Course co T-PD-1 Student w A-PD-1 A-PD-2 A-PD-3 A-PD-4	ourse unit objective to assess the capa creation of compe- written report on p to know basic rule to create an ability to create an ability ontent divided into Diploma thesis pro- workload - forms o Desk study Research work on Consultances with Preparation of the of research work, chapters order, fir list of used source	res bility of tency to professio s how to r to mak r to prep variou paration f activit given to thesis th sis introd tests, gra al remai	the student to un use information to onal activity, analy o use source mate e a medial preser pare conclusions a s forms of instru- n, power point pre- y ppic utor, discussions duction, assumpti aphs, analysis of rks and conclusion	echnics, protection yses, calculations, d rial, how to prepare nation from the top and analysis result o uction esentation.	of copyrigh esign proce own concl ics coverin n final thes creation of ests, reseau final thesis	nt law and pro ess. usions, opinio g final thesis sis content. literature rev rch, literature , correction pi	riew, exe Discuss rocedure	cution sion on c, final	ect of realize cialisation.	d work. f hours 0 f hours 86 145 65
Module/cc C-1 C-2 C-3 C-4 C-5 Course co T-PD-1 Student w A-PD-1 A-PD-2 A-PD-3 A-PD-4	ourse unit objective to assess the capa creation of compe- written report on p to know basic rule to create an ability to create an ability to create an ability ontent divided into Diploma thesis pre- workload - forms o Desk study Research work on Consultances with Preparation of the of research work, chapters order, fir list of used source and results.	<i>Yes</i> Ibility of tency to professions s how to y to mak y to prep o variou paration f activit given to thesis tr sis introot thesis tr sis introot thesis tr sis introot	the student to un use information to onal activity, analy o use source mate e a medial preser pare conclusions a s forms of instru- n, power point pre- y ppic utor, discussions duction, assumpti aphs, analysis of rks and conclusion	echnics, protection yses, calculations, d rial, how to prepare nation from the top and analysis result o uction esentation.	of copyrigh esign proce own concl ics coverin n final thes creation of ests, reseau final thesis	nt law and pro ess. usions, opinio g final thesis sis content. literature rev rch, literature , correction pi	riew, exe Discuss rocedure	cution sion on c, final	ect of realize cialisation.	d work. f hours 0 f hours 86 145 65
Module/cc C-1 C-2 C-3 C-4 C-5 Course co T-PD-1 Student w A-PD-1 A-PD-3 A-PD-4	ourse unit objective to assess the capa creation of compe- written report on p to know basic rule to create an ability to create an ability ontent divided into Diploma thesis pre- workload - forms o Desk study Research work on Consultances with Preparation of the of research work, chapters order, fir list of used source and results. methods / tools	res ibility of tency to professio s how to / to mak / to prep o variou eparation f activit given to thesis th sis introd tests, gra al remain s. Final v ethod	the student to un use information to onal activity, analy o use source mate e a medial preser pare conclusions a s forms of instru- n, power point pre- y ppic utor, discussions duction, assumpti aphs, analysis of rks and conclusion	echnics, protection yses, calculations, d rial, how to prepare nation from the top and analysis result o uction esentation.	of copyrigh esign proce own concl ics coverin n final thes creation of ests, reseau final thesis	nt law and pro ess. usions, opinio g final thesis sis content. literature rev rch, literature , correction pi	riew, exe Discuss rocedure	cution sion on c, final	ect of realize cialisation.	d work. f hours 0 f hours 86 145 65
Module/cc C-1 C-2 C-3 C-4 C-5 Course co T-PD-1 Student w A-PD-1 A-PD-3 A-PD-4 Teaching M-1 M-2	ourse unit objective ourse unit objective to assess the capa creation of comperent on perent of the composition of the composit	<i>Yes</i> Ibility of tency to professions s how to y to mak y to prep o variou paration f activit given to thesis tr sis introo tests, gra al remains. Final v ethod s	the student to un use information to onal activity, analy o use source mate e a medial preser pare conclusions a s forms of instru- n, power point pre- y ppic utor, discussions duction, assumpti aphs, analysis of rks and conclusio version of the the	echnics, protection yses, calculations, d rial, how to prepare nation from the top and analysis result o uction esentation.	of copyrigh esign proce own concl ics coverin n final thes creation of ests, reseau final thesis	nt law and pro ess. usions, opinio g final thesis sis content. literature rev rch, literature , correction pi	view, exe Discuss rocedure	cution sion on c, final	ect of realize cialisation.	d work. f hours 0 f hours 86 145 65
Module/cc C-1 C-2 C-3 C-4 C-5 Course co T-PD-1 Student w A-PD-1 A-PD-3 A-PD-4 Teaching M-1 M-2	ourse unit objective ourse unit objective to assess the capa creation of comperent of present of the composition of the composition of the composition of the consultances with Preparation of the consultances with Interthods / tools classic problem m activating mathods (F - procession)	ves ibility of tency to professio s how to v to mak v to prep variou eparation f activit given to thesis th sis introo tests, gra al remain s. Final v ethod s ogressiv	the student to un use information to onal activity, analy o use source mate e a medial preser pare conclusions a s forms of instru- n, power point pre- y ppic utor, discussions duction, assumpti aphs, analysis of rks and conclusio version of the the	echnics, protection yses, calculations, d rial, how to prepare nation from the top and analysis result o uction esentation.	of copyrigh esign proce own concl ics coverin n final thes creation of ests, reseau final thesis	nt law and pro ess. usions, opinio g final thesis sis content. literature rev rch, literature , correction pi	view, exe Discuss rocedure	cution sion on c, final	ect of realize cialisation.	d work. f hours 0 f hours 86 145 65
Module/cc C-1 C-2 C-3 C-4 C-5 Course co T-PD-1 Student w A-PD-1 A-PD-2 A-PD-3 A-PD-3 A-PD-4 Teaching M-1 M-2 Evaluation	ourse unit objective ourse unit objective to assess the capa creation of comperent of present of the composition of the composition of the composition of the consultances with Preparation of the consultances with Interthods / tools classic problem m activating mathods (F - procession)	res ibility of tency to professio s how to r to mak r to prep variou eparation f activit given to thesis th sis introd tests, gra al remain s. Final v ethod s ogressiv sment o	the student to un use information to onal activity, analy o use source mate e a medial preser pare conclusions a s forms of instru- n, power point pre- y ppic utor, discussions duction, assumpti aphs, analysis of rks and conclusion version of the the re, P - final) f Master thesis	echnics, protection yses, calculations, d rial, how to prepare ntation from the top and analysis result o <i>uction</i> esentation. and conclusions ons for final thesis, results. Additional thesis, results. Additio	of copyrigh esign proce own concl ics coverin n final thes creation of ests, reseau final thesis	nt law and pro ess. usions, opinio g final thesis sis content. literature rev rch, literature , correction pi	view, exe Discuss rocedure	cution sion on c, final	ect of realize cialisation.	d work. f hours 0 f hours 86 145 65 300 Evaluatio
Module/cc C-1 C-2 C-3 C-4 C-5 Course co T-PD-1 Student w A-PD-1 A-PD-2 A-PD-3 A-PD-3 A-PD-4 Teaching M-1 M-2 Evaluation	ourse unit objective ourse unit objective to assess the capa creation of comperent on preprint on the port on the port on the port on the port on the preprint of the create an ability to create an ability to create an ability ontent divided into Diploma thesis preprint on the preparation of the of research work on Consultances with Preparation of the of research work, chapters order, fir list of used source and results. methods / tools classic problem m activating mathod n methods (F - properation) P Final asses	res ibility of tency to professio s how to r to mak r to prep variou eparation f activit given to thesis th sis introd tests, gra al remain s. Final v ethod s ogressiv sment o	the student to un use information to onal activity, analy o use source mate e a medial preser pare conclusions a s forms of instru- n, power point pre- y ppic utor, discussions duction, assumpti aphs, analysis of rks and conclusion version of the the re, P - final) f Master thesis	echnics, protection yses, calculations, d rial, how to prepare ntation from the top and analysis result o uction esentation. and conclusions ons for final thesis, results. Additional to ns. Draft version of sis, printing, prepare Reference to the learning outcomes designed for the fields of Reference to the learning outcomes designed for the fields of and conclusions	of copyrigh esign proce e own concl ics coverin- in final thes creation of ests, reseat final thesis ation for pr	nt law and pro- ess. usions, opinio g final thesis a sis content.	riew, exe Discuss rocedure main top	ecution sion on sion on sion sion	ect of realize cialisation.	d work. f hours 0 f hours 86 145 65 300 Evaluatio

Skills							
B-A_2A_A/A/05-3_U01 Student is able to choose specialistic tools and CAD software supporting designers work or/and adopt existing tools or develop new ones to formulate hypothesis related to engineering problems and basic research problems. For developed aspects connected to diploma thesis student is able to gain literaure sources, and is able to prepare scientific paper and multimedial presentation.	B-A_2A_U01 B-A_2A_U03 B-A_2A_U04 B-A_2A_U05 B-A_2A_U07 B-A_2A_U12 B-A_2A_U19	P7S_UK P7S_UO P7S_UU P7S_UW_TA21 P7S_UW_TA22 P7S_UW_TA24	P75_UW_IA22	C-1 C-2 C-3 C-4 C-5	T-PD-1	M-1 M-2	S-1
Other social / personal competences							
B-A_2A_A/A/05-3_K01 Student is exposing responsibility for his/her work as well as for the other participants of work, uses rules of professional ethics and uderstands the necessity to share his/her knowledge to the society in form of conclusions, descriptions relevant to priorities for execution of civil engineering activities. Is ready to update his/her professional and personal competences. Completes knowledge of modern processes, technologies management tools in building industry.	B-A_2A_K01 B-A_2A_K02 B-A_2A_K06 B-A_2A_K09	P7S_KK P7S_KR		C-1 C-2 C-3 C-4 C-5	T-PD-1	M-1 M-2	S-1
Required reading							
1. according to the topic of prepared Master thesis							
Supplementary reading							
1. suggested by diploma thesis tutor, 2011							

Field of st		1					7			
	tudy	Civil E	Ingineering							
Mode of s	study	statio	nary	Level	second	cycle				
Graduate'	's qualification	magis	ster				١٨	VBi/	Δ	
Area(s) of	f study	nauki	techniczne				v	יוטי	<u>۱</u>	
Education	nal profile	gener	al academic				1 [
Module	•							- 11		
Course ur	nit	Diplo	ma Thesis ICN	1				- 11	╵║╠	1 -
Code			/S2CE/A/05-2	-				- 11		1
	pecialisation	112	0202,7,700 2				1	- 11		
	ering faculty	Dzieka	anat							
ECTS		20,0		ECTS (forms)	20,0		_			
	ourse credit	credit	<u> </u>		english		_			
Electives	ourse crean	5	5	Language	english		_			
				Elective group						
Form of ir	nstruction	Code	Semester	Hours		ECTS		eight	Crec	
		PD	3	0		20,0	1,	,00	cred	ts
Leading te	eacher	SSB P	rodziekan (Prod	lziekan.SSB@zut.	edu.pl)					
Other tea	chers									
Prerequis	ites									
W-1	all subjects passe	ł								
W-2	Basics of Scientific	Informa	ation passed							
VV-2	Basics of Scienting	. Informa	acion pubbeu							
	ourse unit objectiv	'es	·	idertake independe	nt research	based work a	at Maste	r level		
Module/co	ourse unit objectiv to assess the capa creation of compe	<i>es</i> bility of tency to	the student to un use information t	idertake independe technics, protection yses, calculations, d	of copyrigh	nt law and pro			. To create a	oility of
Module/cc C-1 C-2 C-3	ourse unit objectiv to assess the capa creation of compe written report on p to know basic rule	<i>'es</i> bility of tency to professio s how to	the student to un use information t nal activity, analy use source mate	technics, protection yses, calculations, d rial, how to prepare	of copyrigh esign proce own concl	nt law and pro ess. usions, opinio	ofessiona ons, bein	al ethics. g an effe	ect of realize	-
Module/cc C-1 C-2 C-3 C-4	ourse unit objective to assess the capa creation of comperent on perent on perent written report on perent to know basic rule to create an ability	res ibility of tency to professio s how to r to mak	the student to un use information t nal activity, analy use source mate e a medial preser	technics, protection yses, calculations, d rial, how to prepare ntation from the top	of copyrighesign proce own concl ics coverin	nt law and pro ess. usions, opinio g final thesis	ofessiona ons, bein	al ethics. g an effe	ect of realize	-
Module/cc C-1 C-2 C-3	ourse unit objective to assess the capa creation of comperent on perent on perent written report on perent to know basic rule to create an ability	res ibility of tency to professio s how to r to mak	the student to un use information t nal activity, analy use source mate e a medial preser	technics, protection yses, calculations, d rial, how to prepare	of copyrighesign proce own concl ics coverin	nt law and pro ess. usions, opinio g final thesis	ofessiona ons, bein	al ethics. g an effe	ect of realize	-
Module/cc C-1 C-2 C-3 C-4 C-5	ourse unit objective to assess the capa creation of comperent on perent on perent written report on perent to know basic rule to create an ability	res ibility of tency to professio s how to r to mak r to prep	the student to un use information t nal activity, analy use source mate e a medial preser pare conclusions a	technics, protection yses, calculations, d rial, how to prepare ntation from the top and analysis result c	of copyrighesign proce own concl ics coverin	nt law and pro ess. usions, opinio g final thesis	ofessiona ons, bein	al ethics. g an effe	ect of realize	d work.
Module/cc C-1 C-2 C-3 C-4 C-5	to assess the capa creation of compe written report on p to know basic rule to create an ability	res ibility of tency to professio s how to r to mak r to prep	the student to un use information to anal activity, analy use source mate e a medial preser are conclusions a s forms of instru	technics, protection yses, calculations, d rial, how to prepare ntation from the top and analysis result o uction	of copyrighesign proce own concl ics coverin	nt law and pro ess. usions, opinio g final thesis	ofessiona ons, bein	al ethics. g an effe	ect of realize	d work.
Module/cc C-1 C-2 C-3 C-4 C-5 Course co T-PD-1	to assess the capa creation of compe written report on p to know basic rule to create an ability to create an ability	ves ibility of tency to professio s how to v to mak v to prep variou	the student to un use information to nal activity, analy use source mate e a medial preservare conclusions a s forms of instru- n, power point pre	technics, protection yses, calculations, d rial, how to prepare ntation from the top and analysis result o uction	of copyrighesign proce own concl ics coverin	nt law and pro ess. usions, opinio g final thesis	ofessiona ons, bein	al ethics. g an effe	ect of realize	d work. f hours 0
Module/cc C-1 C-2 C-3 C-4 C-5 Course co T-PD-1	to assess the capa creation of compe written report on p to know basic rule to create an ability to create an ability ontent divided into Diploma thesis pro	ves ibility of tency to professio s how to v to mak v to prep variou	the student to un use information to nal activity, analy use source mate e a medial preservare conclusions a s forms of instru- n, power point pre	technics, protection yses, calculations, d rial, how to prepare ntation from the top and analysis result o uction	of copyrighesign proce own concl ics coverin	nt law and pro ess. usions, opinio g final thesis	ofessiona ons, bein	al ethics. g an effe	ect of realize cialisation.	d work. f hours 0
Module/cc C-1 C-2 C-3 C-4 C-5 Course co T-PD-1 Student w	ourse unit objectiv to assess the capa creation of compe written report on p to know basic rule to create an ability to create an ability ontent divided into Diploma thesis pre-	res ibility of tency to professio s how to r to mak r to prep variou. eparation f activit	the student to un use information to nal activity, analy use source mate e a medial preser pare conclusions a s forms of instru- n, power point pre	technics, protection yses, calculations, d rial, how to prepare ntation from the top and analysis result o uction	of copyrighesign proce own concl ics coverin	nt law and pro ess. usions, opinio g final thesis	ofessiona ons, bein	al ethics. g an effe	ect of realize cialisation.	d work. f hours 0 f hours
Module/cc C-1 C-2 C-3 C-4 C-5 Course co T-PD-1 Student w A-PD-1	ourse unit objective to assess the capa creation of comperent on present of comperent of comperent of comperent of the composition of the comp	res ibility of tency to professio s how to r to mak r to prep variou paration f activit given to thesis t	the student to un use information to nal activity, analy use source mate e a medial preservare conclusions a s forms of instru- n, power point pre- y pic utor, discussions	technics, protection yses, calculations, d irial, how to prepare ntation from the top and analysis result o uction esentation.	of copyrigi esign proce e own concl ics coverin on final thes	nt law and pro ess. usions, opinio g final thesis sis content.	ofessiona ons, bein and stud	al ethics. g an effe lied spec	ect of realize cialisation.	f hours 0 f hours 86
Module/cc C-1 C-2 C-3 C-4 C-5 Course co T-PD-1 Student w A-PD-1 A-PD-2	ourse unit objective ourse unit objective to assess the capa creation of compe written report on p to know basic rule to create an ability to create an ability ontent divided into Diploma thesis prevorkload - forms o Desk study Research work on Consultances with Preparation of the of research work, chapters order, fir	res bility of tency to professio s how to r to mak r to prep variou paration f activit given to thesis th sis introd tests, gra al remai	the student to un use information to inal activity, analy use source mate e a medial preser are conclusions a s forms of instru- n, power point pre- y pic utor, discussions duction, assumpti aphs, analysis of rks and conclusion	technics, protection yses, calculations, d rial, how to prepare ntation from the top and analysis result c uction esentation.	of copyrigh esign proce own concl ics coverin in final thes creation of ests, reseau final thesis	nt law and pro ess. usions, opinio g final thesis sis content.	view, exe ricew, exe	al ethics. g an effe lied spec	ect of realize cialisation.	d work. f hours 0 f hours 86 145
Module/cc C-1 C-2 C-3 C-4 C-5 Course co T-PD-1 Student w A-PD-1 A-PD-2 A-PD-3 A-PD-4	ourse unit objective ourse unit objective to assess the capa creation of compe written report on p to know basic rule to create an ability to create an ability ontent divided into Diploma thesis prevented and the second of th	res bility of tency to professio s how to r to mak r to prep variou paration f activit given to thesis th sis introd tests, gra al remai	the student to un use information to inal activity, analy use source mate e a medial preser are conclusions a s forms of instru- n, power point pre- y pic utor, discussions duction, assumpti aphs, analysis of rks and conclusion	technics, protection yses, calculations, d rial, how to prepare ntation from the top and analysis result o uction esentation.	of copyrigh esign proce own concl ics coverin in final thes creation of ests, reseau final thesis	nt law and pro ess. usions, opinio g final thesis sis content.	view, exe ricew, exe	al ethics. g an effe lied spec	ect of realize cialisation.	d work. f hours 0 f hours 86 145 65
Module/cc C-1 C-2 C-3 C-4 C-5 Course co T-PD-1 Student w A-PD-1 A-PD-2 A-PD-3 A-PD-4	ourse unit objective to assess the capa creation of comperent on present on present on present on present on present on the preparation of the of research work on the preparation of the of research work, chapters order, fin list of used source and results.	<i>Yes</i> Ibility of tency to professions s how to y to mak y to prep o variou paration f activit given to thesis tr sis introot thesis tr sis introot thesis tr sis introot	the student to un use information to inal activity, analy use source mate e a medial preser are conclusions a s forms of instru- n, power point pre- y pic utor, discussions duction, assumpti aphs, analysis of rks and conclusion	technics, protection yses, calculations, d rial, how to prepare ntation from the top and analysis result o uction esentation.	of copyrigh esign proce own concl ics coverin in final thes creation of ests, reseau final thesis	nt law and pro ess. usions, opinio g final thesis sis content.	view, exe ricew, exe	al ethics. g an effe lied spec	ect of realize cialisation.	d work. <i>f hours</i> 0 <i>f hours</i> 86 145 65
Module/cc C-1 C-2 C-3 C-4 C-5 Course co T-PD-1 Student w A-PD-1 A-PD-2 A-PD-3 A-PD-4	ourse unit objective to assess the capa creation of comperent on present on the composition of the compo	res ibility of tency to professio s how to / to mak / to prep o variou eparation f activit given to thesis th sis introd tests, gra al remain s. Final v ethod	the student to un use information to inal activity, analy use source mate e a medial preser are conclusions a s forms of instru- n, power point pre- y pic utor, discussions duction, assumpti aphs, analysis of rks and conclusion	technics, protection yses, calculations, d rial, how to prepare ntation from the top and analysis result o uction esentation.	of copyrigh esign proce own concl ics coverin in final thes creation of ests, reseau final thesis	nt law and pro ess. usions, opinio g final thesis sis content.	view, exe ricew, exe	al ethics. g an effe lied spec	ect of realize cialisation.	d work. f hours 0 f hours 86 145 65
Module/cc C-1 C-2 C-3 C-4 C-5 Course co T-PD-1 Student w A-PD-1 A-PD-3 A-PD-4 Teaching M-1 M-2	ourse unit objective to assess the capa creation of comperent on presented in the second of the sec	res ibility of tency to professio s how to r to mak r to prep variou paration f activit given to thesis tr sis introo tests, gr al remai s. Final v ethod s	the student to un use information to inal activity, analy use source mate e a medial preser pare conclusions a s forms of instru- n, power point pre- y pic utor, discussions duction, assumpti aphs, analysis of rks and conclusio version of the the	technics, protection yses, calculations, d rial, how to prepare ntation from the top and analysis result o uction esentation.	of copyrigh esign proce own concl ics coverin in final thes creation of ests, reseau final thesis	nt law and pro ess. usions, opinio g final thesis sis content.	view, exe ricew, exe	al ethics. g an effe lied spec	ect of realize cialisation.	d work. f hours 0 f hours 86 145 65
Module/cc C-1 C-2 C-3 C-4 C-5 Course co T-PD-1 Student w A-PD-1 A-PD-3 A-PD-4 Teaching M-1 M-2	ourse unit objective to assess the capa creation of comperent of the composition of t	ves ibility of tency to professio s how to v to mak v to prep variou eparation f activit given to thesis th sis introo tests, gra al remain s. Final v ethod s ogressiv	the student to un use information to inal activity, analy use source mate e a medial preser pare conclusions a s forms of instru- n, power point pre- y pic utor, discussions duction, assumpti aphs, analysis of rks and conclusio version of the the	technics, protection yses, calculations, d rial, how to prepare ntation from the top and analysis result o uction esentation.	of copyrigi esign proce own concl ics coverin in final thes creation of ests, reseau final thesis	nt law and pro ess. usions, opinio g final thesis sis content.	view, exe ricew, exe	al ethics. g an effe lied spec	ect of realize cialisation.	d work. f hours 0 f hours 86 145 65
Module/cc C-1 C-2 C-3 C-4 C-5 Course co T-PD-1 Student w A-PD-1 A-PD-2 A-PD-3 A-PD-3 A-PD-4 Teaching M-1 M-2 Evaluation	ourse unit objective to assess the capa creation of comperent of the composition of t	res ibility of tency to professio s how to r to mak r to prep variou eparation f activit given to thesis th sis introd tests, gra al remainants. Final v ethod s ogressiv sment o	the student to un use information to inal activity, analy use source mate e a medial preser are conclusions a s forms of instru- n, power point pre- y pic utor, discussions duction, assumpti aphs, analysis of rks and conclusion version of the the re, P - final) f Master thesis	technics, protection yses, calculations, d rial, how to prepare ntation from the top and analysis result o uction esentation. and conclusions ons for final thesis, results. Additional t ns. Draft version of sis, printing, prepar	of copyrigi esign proce own concl ics coverin in final thes creation of ests, reseau final thesis	nt law and pro ess. usions, opinio g final thesis sis content.	view, exe ricew, exe	al ethics. g an effe lied spec	ect of realize cialisation.	d work. f hours 0 f hours 86 145 65 300 g Evaluatio
Module/cc C-1 C-2 C-3 C-4 C-5 Course co T-PD-1 Student w A-PD-1 A-PD-2 A-PD-3 A-PD-3 A-PD-4 Teaching M-1 M-2 Evaluation	ourse unit objective to assess the capa creation of comperent on present on the composition of comperent on present on the composition of the compositic definition of the compositic definition of the composite definito	res ibility of tency to professio s how to r to mak r to prep variou eparation f activit given to thesis th sis introd tests, gra al remainants. Final v ethod s ogressiv sment o	the student to un use information to inal activity, analy use source mate e a medial preser are conclusions a s forms of instru- n, power point pre- y pic utor, discussions duction, assumpti aphs, analysis of rks and conclusion version of the the re, P - final) f Master thesis	echnics, protection yses, calculations, d erial, how to prepare ntation from the top and analysis result o uction esentation. and conclusions ons for final thesis, results. Additional t ns. Draft version of sis, printing, prepar	of copyrigh esign proce e own concl ics coverin- in final thes creation of ests, reseat final thesis ation for pr	nt law and pro- ess. usions, opinio g final thesis sis content.	ofessiona ons, bein and stud in stud riew, exe . Discuss rocedure main to	ecution sion on e, final pics	ect of realize	d work. f hours 0 f hours 86 145 65 300 g Evaluation

Skills							
B-A_2A_A/A/05-2_U01 Student is able to choose specialistic tools and CAD software supporting designers work or/and adopt existing tools or develop new ones to formulate hypothesis related to engineering problems and basic research problems. For developed aspects connected to diploma thesis student is able to gain literaure sources, and is able to prepare scientific paper and multimedial presentation.	B-A_2A_U01 B-A_2A_U03 B-A_2A_U04 B-A_2A_U05 B-A_2A_U05 B-A_2A_U07 B-A_2A_U12 B-A_2A_U19	P7S_UK P7S_U0 P7S_UU P7S_UW_TA21 P7S_UW_TA22 P7S_UW_TA24	P75_UW_IA22	C-1 C-2 C-3 C-4 C-5	T-PD-1	M-1 M-2	S-1
Other social / personal competences							
B-A_2A_A/A/05-2_K01 Student is exposing responsibility for his/her work as well as for the other participants of work, uses rules of professional ethics and uderstands the necessity to share his/her knowledge to the society in form of conclusions, descriptions relevant to priorities for execution of civil engineering activities. Is ready to update his/her professional and personal competences. Completes knowledge of modern processes, technologies management tools in building industry.	B-A_2A_K01 B-A_2A_K02 B-A_2A_K06 B-A_2A_K09	P7S_KK P7S_KR		C-1 C-2 C-3 C-4 C-5	T-PD-1	M-1 M-2	S-1
Required reading							
1. according to the topic of prepared Master thesis							
Supplementary reading							
1. suggested by diploma thesis tutor, 2011							

Field of stu	ıdy	Civil Er	ngineering	1							
Mode of stu	udy	station	ary	Level	second	cycle					
Graduate's	qualification	magist	er				V	VBi <i>l</i>	1		
Area(s) of s	study	nauki t	echniczne						·		-
Educationa	al profile	genera	l academic					- 11		_	
Module								- 11	п	Ln	
Course uni	t	Diplon	na Seminar -	prof. Iwankie	ewicz			- 11			
Code		WBIA/S	S2CE/A/06-1					- 11			
Field of spe	ecialisation							L II			
Administer	ing faculty	Zakład	Teorii Konstru	kcji							
ECTS		3,0		ECTS (forms)	3,0						
Form of co	urse credit	credits		Language	english	1					
Electives		6		Elective group	0						
Form of ins	struction	Code	Semester	Hours		ECTS	W	eight	0	Credit	-
diploma/th	esis seminars	SD	3	45		3,0	1	,00	с	redit	5
Leading tea	acher	Iwankie	ewicz Radosłav	v (riwankiewicz	z@zut.edu.pl	l)					
Other teac			Adrian (Adrian.								
Prerequisit	es										
	Courses pertinent	to MSc ir	n Engineering de	egree course							
Module/cou	urse unit objectiv	es									
	Capability to prese		ncepts, the prog	ress and the find	dings of MSc t	hesis.					
Course cor	ntent divided into	various	forms of instru	ıction					Numb	er of	hours
	Attending seminar										45
Student wo	orkload - forms o	f activitv	,						Numb	er of	hours
	Attending the sem										45
A-SD-2	Preparing own pre	sentation	(s).								45
Teaching n	nethods / tools										
M-1	Seminars.										
Evaluation	methods (F - pro	gressive	e, P - final)								
S-1	F Seminar pr	esentatio	on(s).								
				Reference to the	Reference to the	Deference to				eaching	Evaluatio methods
	Designed learnin	g outcor	mes	learning outcomes designed for the fields of study	learning outcomes	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course co		nethods	
Knowledge	_	g outcor	nes	learning outcomes designed for the fields of	learning outcomes defined for the particular areas of	learning outcomes leading to the		Course co			
Knowledge B-A_2A_A/A/06 Student should	2	e and deve	elop fundamental	learning outcomes designed for the fields of	learning outcomes defined for the particular areas of	learning outcomes leading to the degree of "inżynier"		Course co			S-1
Knowledge B-A_2A_A/A/06 Student should research conce Skills B-A_2A_A/A/06 Student should	55_W01 d be able to formulate epts essential for his/ 55_U01 d have a capability to	e and deve her MSc th	elop fundamental esis.	learning outcomes designed for the fields of study	learning outcomes defined for the particular areas of education	learning outcomes leading to the degree of "inżynier"	objectives			nethods	S-1 S-1
Knowledge B-A_2A_A/A/06 Student should research conce Skills B-A_2A_A/A/06 Student should the concepts,	5b_W01 d be able to formulate epts essential for his/ 5b_U01	e and deve her MSc th present at findings of	elop fundamental esis. different stages MSc thesis.	learning outcomes designed for the fields of study B-A_2A_W02 B-A_2A_U02	learning outcomes defined for the particular areas of education P7S_WG_TA21	learning outcomes leading to the degree of "inżynier"	C-1	T-SD-1		M-1	
Knowledge B-A_2A_A/A/06 Student should research conce Skills B-A_2A_A/A/06 Student should the concepts, Other socia B-A_2A_A/A/06 Student should	5b_W01 d be able to formulate epts essential for his/ 5b_U01 d have a capability to the progress and the al / personal com 5b_K01 d be able to make an ages his/her MSc thes	e and deve her MSc th present at findings of petence. oral/compu	elop fundamental esis. : different stages : MSc thesis. S uter presentation	learning outcomes designed for the fields of study B-A_2A_W02 B-A_2A_U02	learning outcomes defined for the particular areas of education P7S_WG_TA21	learning outcomes leading to the degree of "inżynier"	C-1	T-SD-1		M-1	
Knowledge B-A_2A_A/A/06 Student should research conce Skills B-A_2A_A/A/06 Student should the concepts, Other socia B-A_2A_A/A/06 Student should of different sta	5b_W01 d be able to formulate epts essential for his/ 5b_U01 d have a capability to the progress and the al / personal com 5b_K01 d be able to make an ages his/her MSc thes ssions.	e and deve her MSc th present at findings of petence. oral/compu	elop fundamental esis. : different stages : MSc thesis. S uter presentation	B-A_2A_W02 B-A_2A_U02 B-A_2A_U04	P75_WG_TA21	learning outcomes leading to the degree of "inżynier"	C-1 C-1	T-SD-1 T-SD-1		M-1 M-1	S-1

Field of s	study	Civil E	Engineering				
Mode of	study	statio	nary	Level	second cycle		
Graduate	e's qualification	magis	ster			WBi/	Δ
Area(s) c	of study	nauki	techniczne			VVDI/	`
Educatio	nal profile	aener	al academic				
Module	- I					-	
Course u	ınit	Diplo	ma Seminar -	prof. Kaszyńska	1	-	
Code		-	/S2CE/A/06-2			-	
	specialisation		52CL/A/00-2			- \	
	-	Katad	ra Kanstruksii Ż	elbetowych i Tec	pologii Potopu		
	ering faculty			-	_		
ECTS		3,0		ECTS (forms)	3,0		
	course credit	credit	S	Language	english		
Electives	5	6		Elective group			
Form of	instruction	Code	Semester	Hours	ECTS	Weight	Credit
diploma/	thesis seminars	SD	3	45	3,0	1,00	credits
Leading	teacher	Kaszy	ńska Maria (Ma	ria.Kaszynska@zu	it.edu.pl)		
Other tea					·		
Prerequi	sites	<u> </u>					
W-1	Passed all courses	from th	e specialty				
C-1	course unit objectiv		riting theorie				
C-1 C-2		-		iquos complianco v	vith copyright laws and	d work othics	
C-2 C-3					es and conducted assi		sis range
C-4	Acquiring ability to						Sis range
	ontent divided into			-			Number of hours
					ification of design and	experimental	
T-SD-1	thesis. General rule	es for pr	reparation of the t	hesis plan. Prepara	tions: initial arrangem	ent of the thesis.	4
T-SD-2					Basic content of the in of research methods f		3
	studies, study desi	gn meth	nods. Determinati	on of the initial con	cept in case of design	project.	
T-SD-3	reference list.	ig acqui	red data. Source	selection, databases	s, note indexing, prepa	arations of	3
T-SD-4					atent protection in the	• •	4
T-SD-5	Basic rules of thes figures and equation			oter's first page, ma	rgin alignment, page i	ndexing, table,	4
T-SD-6	Preparation of tabl			s, figures. Rules for	index preparation and	design drawing	4
	in projects	-	atation areaset				
T-SD-7	Rules for PowerPoi	•	• •		ta analysis. Delivering	an oral	4
T-SD-8	presentation in the	thesis	range by each inc	lividual	, ,		7
T-SD-9	Examples of conclu acquired results	usions, e	ending and summ	ary of the thesis. De	etermination of the pro	actical use of	4
T-SD-10		e thesis.	Presentation of c	onclusions, summaı	y. Thesis defense. Dis	cussion on the	8
Student	workload - forms of	^r activit	у У				Number of hours
A-SD-1	Presence on lectur	es	-				45
A-SD-2	Preparations of the	e thesis	plan				4
A-SD-3	Preparations of the	e referer	nce list				4
A-SD-4	Preparations of the	e equatio	ons, tables and fig	gures			4
A-SD-5	Preparation and de		•				15
A-SD-6	Preparation of the	•					10
A-SD-7	Preparation of the						2
A-SD-8	Preparation of the	table of	content and inde	x, tables and figure	s indexes		5

			/ tools								
M-1 M-2	Lectur										
			seminar								
			s (F - progressive, P - final)	<u></u>							
S-1	F		Discussion and potential correction o			, test range ai	nd refer	ences			
5-2	P	A	ssessment of delivered paper end t	hesis presentati	on	1		1			
	Desig	ne	d learning outcomes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course	e content	Teaching methods	Evaluation methods
Knowledg	je			1				1		1	
CE_2A_A/A/C Acquired the subject		dge	on basic issues in the major and thesis	B-A_2A_W01 B-A_2A_W02 B-A_2A_W05 B-A_2A_W06 B-A_2A_W13	P75_WG_TA21	P75_WG_IA21	C-1 C-2 C-3 C-4	T-SD-2 T-SD-3	T-SD-6 T-SD-7 T-SD-8 T-SD-9 T-SD- 10	M-1 M-2	S-1 S-2
CE_2A_A/A/0 Acquired kno		on (data research and source materials	B-A_2A_W01 B-A_2A_W02 B-A_2A_W05 B-A_2A_W06	P7S_WG_TA21	P75_WG_IA21	C-1 C-2 C-3 C-4	T-SD-2 T-SD-3	T-SD-6 T-SD-7 T-SD-8 T-SD-9	M-1 M-2	S-1 S-2
CE_2A_A/A/0 Can prepare chosen spec	and deli		the speech and presentation on the	B-A_2A_W01 B-A_2A_W02 B-A_2A_W05 B-A_2A_W06	P7S_WG_TA21	P7S_WG_IA21	C-1 C-2 C-3 C-4	T-SD-2 T-SD-3	T-SD-6 T-SD-7 T-SD-8 T-SD-9	M-1 M-2	S-1 S-2
Skills											
	proper to		for solving issues meet during thesis prmation technologies	B-A_2A_U01 B-A_2A_U02 B-A_2A_U03	P7S_UK		C-1 C-2 C-3 C-4	T-SD-2 T-SD-3	T-SD-6 T-SD-7 T-SD-8 T-SD-9 T-SD- 10	M-1 M-2	S-1 S-2
CE_2A_A/A/0 Solves basic concrete str	problem	is of	f concrete technology and designing of	B-A_2A_U11 B-A_2A_U12 B-A_2A_U13 B-A_2A_U13 B-A_2A_U18	P75_UK P75_UO P75_UW_TA21 P75_UW_TA22 P75_UW_TA23 P75_UW_TA24		C-1 C-2 C-3 C-4	T-SD-2 T-SD-3 T-SD-4 T-SD-5	T-SD-6 T-SD-7 T-SD-8 T-SD-9 T-SD- 10	M-1 M-2	S-1 S-2
CE_2A_A/A/0 Can on one's thesis		scri	be and deliver the issues regarding	B-A_2A_U11 B-A_2A_U12 B-A_2A_U15 B-A_2A_U18	P7S_UK P7S_UO P7S_UW_TA21 P7S_UW_TA24		C-1 C-2 C-3 C-4	T-SD-2 T-SD-3	T-SD-6 T-SD-7 T-SD-8 T-SD-9 T-SD- 10	M-1 M-2	S-1 S-2
Other soc	ial / pe	erso	onal competences		•			1			
CE_2A_A/A/C Can formula assumptions	te thesis	arr	angement, prepare the tasks and	B-A_2A_K01 B-A_2A_K02 B-A_2A_K03 B-A_2A_K04 B-A_2A_K05 B-A_2A_K06 B-A_2A_K06 B-A_2A_K07 B-A_2A_K08	P75_KK P75_KO P75_KR		C-1 C-2 C-3 C-4	T-SD-2 T-SD-3	T-SD-6 T-SD-7 T-SD-8 T-SD-9 T-SD- 10	M-1 M-2	S-1 S-2
	lish the t		is assumptions and prognoses the mental effects	B-A_2A_K01 B-A_2A_K02 B-A_2A_K03 B-A_2A_K04 B-A_2A_K05 B-A_2A_K06 B-A_2A_K06 B-A_2A_K07 B-A_2A_K08	P75_KK P75_KO P75_KR		C-1 C-2 C-3 C-4	T-SD-2 T-SD-3	T-SD-6 T-SD-7 T-SD-8 T-SD-9 T-SD- 10	M-1 M-2	S-1 S-2
CE_2A_A/A/C Can evaluat conclusions		ults	of one's own work and draw the	B-A_2A_K01 B-A_2A_K02 B-A_2A_K03 B-A_2A_K04 B-A_2A_K05 B-A_2A_K05 B-A_2A_K06 B-A_2A_K07 B-A_2A_K08	P75_KK P75_KO P75_KR		C-1 C-2 C-3 C-4	T-SD-2 T-SD-3	T-SD-6 T-SD-7 T-SD-8 T-SD-9 T-SD- 10	M-1 M-2	S-1 S-2
Required	readin	g									
		-	lechanics, Wiley And Shon, 2008, 8								

Field of s	tudy	Civil E	Ingineering						
Mode of :	study	statio	nary	Level	second	cycle			
Graduate	's qualification	magis	ster	·			WBi.	Д	
Area(s) o	f study	nauki	techniczne					·	_
Educatio	nal profile	gener	al academic						
Module									
Course u	nit	Diplo	ma Seminar -	prof. Meyer					41
Code		WBIA	/S2CE/A/06-3						11
Field of s	pecialisation								11
	ering faculty	Kated	lra Geotechniki					լսլլւ	11
ECTS	5 5	3,0		ECTS (forms)	3,0				
	course credit	credit	·s	Language	english		_		
Electives		6		Elective group			_		
	nstruction	Code	Semester			ECTS	Weight	Cred	;+
				Hours					
•	thesis seminars	SD	3	45		3,0	1,00	credi	
Leading			r Zygmunt (Zyg						
Other tea	achers	Szme	chel Grzegorz (Grzegorz.Szmeo	hel@zut.ed	u.pl)			
Prerequis	sites								
W-1	Completed all su	bjects in t	the field of the stu	udied specialty					
Module/c	ourse unit object	ives							
C-1	Learning the prir	ciples of	writing plans and	the content of di	oloma theses	in the field of	soil mechanics		
C-2	Acquisition of the	e ability to	o prepare present	ations in the thes	is of the MA t	hesis			
Course c	ontent divided in	to variou	s forms of instr	uction				Number o	f hours
T-SD-1	Basic knowledge	about the	e preparation of t	he master thesis	in relation to	issues of soil	mechanics		5
T-SD-2	-		and the structure	•					5
T-SD-3	Catalog methods creating notes, li	for orgar st of litera	nizing the collecte ature	ed materials for th	e diploma the	esis, selection	of sources,		5
T-SD-4	-		tudents of topics		-				10
T-SD-5	Presentation by subject of the pr		nts of the realized	l parts of the Mas	ter's thesis, d	iscussions rel	ated to the		15
T-SD-6	Preparation for p	rinting an	d defense of thes w to provide cont				garding detailed	1	5
Student	workload - forms	of activit	TV					Number o	f hours
A-SD-1	Presence at sem		-						45
A-SD-2	Elaboration of m	aster diplo	oma thesis plan						10
A-SD-3	Preparation of th	e prelimir	nary list of literatu	ıre					5
A-SD-4	Student must pro	epare Mas	ster Thesis first pr	resentation					10
A-SD-5	Master thesis fin	al prepara	ation and presenta	ation at seminar					20
Teaching	methods / tools								
M-1	Information Lect	ure							
M-2	Case Study Lect	ıre							
М-3	Practical method	s- presen	tation						
Evaluatio	on methods (F - p	rogressiv	ve, P - final)						
S-1	F Continuo	us rating o	of work progress						
5-2	P Final pres	entation	rating						
	Designed learn	ing outco	omes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives Course	content Teaching methods	
	ge					I	· · · · ·		1

B-A_2A_A/A/06d_W01 Has knowledge related to the basic issues of the chosen specialty, standards and standards. He knows how to present a presentation on the results of the engineering task	B-A_2A_W01 B-A_2A_W02 B-A_2A_W05 B-A_2A_W06 B-A_2A_W13 B-A_2A_W15	P75_WG_TA21 P75_WK_TA21	P7S_WG_IA21 P7S_WK_IA21	C-1 C-2	T-SD-2	T-SD-4 T-SD-5 T-SD-6	M-1 M-2 M-3	S-1 S-2
Skills								
B-A_2A_A/A/06d_U01 Has the ability to obtain information from literature, formulate hypotheses and prepare and report solutions for the diploma thesis as well as obtain software supporting the organization of the construction process	B-A_2A_U01 B-A_2A_U02 B-A_2A_U03 B-A_2A_U05 B-A_2A_U05 B-A_2A_U09 B-A_2A_U11 B-A_2A_U11 B-A_2A_U12 B-A_2A_U12 B-A_2A_U19 B-A_2A_U22	P75_UK P75_UO P75_UU P75_UW_TA21 P75_UW_TA24	P7S_UW_IA21	C-1 C-2	T-SD-2	T-SD-4 T-SD-5 T-SD-6	M-1 M-2 M-3	5-2
Other social / personal competences								
B-A_2A_A/A/06d_K01 He is aware of the responsibility for his own work and team and understands the need to learn throughout life	B-A_2A_K01 B-A_2A_K02 B-A_2A_K03 B-A_2A_K05 B-A_2A_K06 B-A_2A_K07 B-A_2A_K08	P75_KK P75_KO P75_KR		C-1 C-2	T-SD-2	T-SD-4 T-SD-5 T-SD-6	M-1 M-2 M-3	S-1 S-2
Required reading					-1			-
1. Muni Budhu, Soil Mechanics, Wiley And Shon, 2008, 8								

Field of stu	ıdv	Civil	Engineering				
Mode of st	-	statio		Level	second cycle		
	s qualification	magi	-		Second Cycle		\ \
	•	-				WBi/	4
Area(s) of	-		techniczne				
Education	al profile	gene	ral academic			-	
Module						- 1 11	nllnl
Course un	it	Math	ematics				
Code		WBIA	/S2CE/B/01				
Field of sp	ecialisation						
Administe	ring faculty	Studi	um Matematyki				
ECTS		2,0		ECTS (forms)	2,0		
Form of co	ourse credit	credit	ts	Language	english		
Electives				Elective group		_	
Form of in	struction	Code	Semester	Hours	ECTS	Weight	Credit
lecturing c	ourse	A	1	15	1,0	0,50	credits
lecture		W	1	15	1,0	0,50	credits
Leading te	acher	Boho	nos Adam (Adan	n.Bohonos@zut.eo	du.pl)		
Other tead	chers						
Prerequisi	tes						
W-1	Knowledge of selec degree studies at C				ourses Mathematics-1	and Mathematics-	2 from the 1-st
Module/co	urse unit objective	e <i>s</i>					
C-1	To give the student	s an ex	ktended and deep	ened knowledge of	nigher mathematics		
C-2	To teach the stude	nts me	thods and comput	ational algorithms u	sed in engineering		
С-3	To educate the stud	dents a	bout the necessit	y of whole life learni	ng and responsibility f	or a reliable work	
Course co	ntent divided into	variou	is forms of instru	uction			Number of hours
T-A-1	Basic information frequencies of the partial derivative of				arts and Integration by	/ substitution and	2
T-A-2	Solving ordinary dif						3
Т-А-З	Solving partial diffe	rential	equations of the s	second order using o	anonical form		4
T-A-4	Expansion of a peri	odic fu	nction into Fourie	series			4
T-A-5	Test						2
T-W-1	Ordinary differentia		-				3
T-W-2	Partial differential e course.	equatio	n of second order	, types: parabolic, h	perbolic and elliptic -	elementary	4
T-W-3		wer sei	ries and Fourier se	ries of a periodic fu	nction		4
T-W-4	Fourier transform						2
T-W-5	Test						2
Student w	orkload - forms of	activi	ty				Number of hours
A-A-1	Taking part in exer	cises, s	olving of exercise	s and analyzing prol	olems under supervisio	on of a teacher	13
A-A-2	Self study by solvin	ig exer	cises and analyzin	g problems			5
A-A-3	Test preparration						10
A-A-4	Test						2
A-W-1	Taking part in lectu		-				13
A-W-2	Independent readin	ng of le	cture notes and st	udying literature			7
A-W-3	Exam praparation						8
A-W-4	Exam						2
	methods / tools						
M-1	A lecture with expla			· · · · · · · · · · · · · · · · · · ·			
М-2	Exercises - solving	exercis	ses and problems	concerning topic of	ine lecture		

Evaluatio	n meth	ods (F - progressive, P - final)								
S-1	F	Valuation of students activity during	lectures and exe	ercises						
5-2	Р	Exercises - a test of computational e	xercises							
S-3	Р	Exercises - a test of thoretical questi	ons							
	Desig	ned learning outcomes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course	content	Teaching methods	Evaluation methods
Knowledg	je									
B-A_2A_A/B/ The student and computa mathematics	knows the	e basic definitions, theorems, examples ethods of selected topics of higher	B-A_2A_W01	P7S_WG_TA21	P7S_WG_IA21	C-1 C-2		T-W-4 T-W-5	M-1 M-2	S-1 S-2 S-3
Skills										
	is able to	solve mathematical problems appearing correctly and precisely	B-A_2A_U01 B-A_2A_U10	P7S_UK P7S_UW_TA21	P7S_UW_IA21	C-1 C-2		T-A-4 T-A-5	M-1 M-2	S-1 S-2 S-3
Other soc	ial / pe	rsonal competences								
B-A_2A_A/B/ The student responsibilit	is aware	of necessity of the whole life learning and iable work	B-A_2A_K02	Р75_КК		C-3	T-A-2	T-W-1 T-W-2 T-W-3 T-W-4 T-W-5	M-1 M-2	S-1 S-2
Required	reading	3								
1. Tyn Myi	nt-U, Lok	enath Debnath, Linear Partial Differe	ntial Equations fo	or Scientists a	nd Engineers,	Birkhau	user, 4			
2. K. Weltr	ner, J. Gro	osjean, W. J. Weber, P. Schuster, Math	ematics for Phys	icists and Eng	jineers, Spring	jer, 200	9			
Suppleme	entary r	eading								
1. Donald	A.McQua	nrie, Mathematical Methods for Scient	ists and Enginee	ers, Univ Scien	ce Books, 200)3				
3. Donald	A. McQu	arrie, Mathematical Methods for Scien	tists and Engine	ers part 2, Uni	v Science Boo	oks, 200)3			

Field of s	study	Civil E	ingineering				
Mode of :	study	statio	nary	Level	second cycle		
Graduate	e's qualification	magis	ter			WBi/	Δ
Area(s) o	of study	nauki	techniczne				<u>`</u>
Educatio	nal profile	gener	al academic				
Module							
Course u	init	Comp	olex Concrete	Structures			
Code		WBIA/	S2CE/A/C/01				
Field of s	specialisation						
Administ	ering faculty	Kated	ra Konstrukcji Ż	Zelbetowych i Tech	nologii Betonu		
ECTS	<u> </u>	3,0	·	ECTS (forms)	3,0		
	course credit		ination	Language	english	-	
Electives				Elective group		-	
	instruction	Code	Semester	Hours	ECTS	Weight	Credit
		P		15			
project c	ouise	W N	1		1,5	0,50	credits
lecture			1	15	1,5	0,50	examination
Leading	teacher				(iernozycki@zut.edu.	•	
Other tea	achers			tr.Brzozowski@zut n.Zielinski@zut.edi	.edu.pl), Visiting Prof u.pl)	essor (Visiting)	@zut.edu.pl),
Prerequis	sites	I		<u>v</u>	- · ·		
W-1		ajor of any sj	pecialty in Civil E	ngineering as full-tim	e or extramural studies	;	
Module/c	ourse unit obje	ctives					
C-1			ore-stressed struc	ctures			
Course o	ontent divided	into variou	s forms of instr	uction			Number of hours
T-P-1	Design of pre-s	stressed or p	oost-tensioned gi	rder: Selection of the	cross-section, tendons Girder design drawings		15
T-W-1		-		-	t-tensioned and pre-str		2
T-W-2	Materials used stressing equip		sed and post-ten	sioned structures: co	ncrete, pre-stressing st	eel, tendons,	3
T-W-3	Calculation cor cracking and d		ain limiting, loss i	n pre-stressing force	ultimate limit state re		_
		IATIACTION			, ultimate innit state, re	sistance to	5
T-W-4	-		ioned girders, de	sign rules, marking o	out of tendons, example		5
T-W-4 T-W-5	-	nd post-tens	J	sign rules, marking c			-
	Pre-stressed and Cylindrical pre Design of pre-st	nd post-tens -stressed co stressed or p	ncrete tanks post-tensioned gir	rder: Selection of the		and stressing	3
T-W-5 T-W-6	Pre-stressed and Cylindrical pre Design of pre-st	nd post-tens -stressed co stressed or p ng of ultima	ncrete tanks post-tensioned gin te limit state and	rder: Selection of the	out of tendons, example	and stressing	3
T-W-5 T-W-6	Pre-stressed a Cylindrical pre Design of pre-s force. Evaluati	nd post-tens -stressed co stressed or p ng of ultima as of activit	ncrete tanks post-tensioned gin te limit state and	rder: Selection of the	out of tendons, example	and stressing	3 1 1
T-W-5 T-W-6 Student	Pre-stressed a Cylindrical pre Design of pre-s force. Evaluati	nd post-tens -stressed co stressed or p ng of ultima of activit n classes	ncrete tanks post-tensioned gi te limit state and y	rder: Selection of the	out of tendons, example	and stressing	3 1 Number of hours
T-W-5 T-W-6 Student 1 A-P-1	Pre-stressed and Cylindrical pre- Design of pre-st force. Evaluati workload - form Participation in Participation in Individual prep	nd post-tens -stressed co stressed or p ng of ultima of <i>of activit</i> n classes n consultatio paration of d	ncrete tanks post-tensioned gi te limit state and y	rder: Selection of the cracking resistance.	out of tendons, example	and stressing	3 1 1 Number of hours 15
T-W-5 T-W-6 Student M A-P-1 A-P-2 A-P-3 A-P-4	Pre-stressed and Cylindrical pre- Design of pre-s force. Evaluati workload - form Participation in Participation in Individual prep Preparation for	nd post-tens -stressed co stressed or p ng of ultima of activit n classes n consultatio paration of d r grading	ncrete tanks post-tensioned gin te limit state and y ns	rder: Selection of the cracking resistance.	out of tendons, example	and stressing	3 1 1 Number of hours 15 2 20 7
T-W-5 T-W-6 Student (A-P-1 A-P-2 A-P-3 A-P-3 A-P-4 A-P-5	Pre-stressed at Cylindrical pre-stressed at Design of pre-stressed at force. Evaluati workload - form Participation ir Participation ir Individual prep Preparation for Controlled Ass	nd post-tens -stressed co stressed or p ng of ultima of activit n classes n consultatio paration of d r grading essment	ncrete tanks post-tensioned gin te limit state and y ns	rder: Selection of the cracking resistance.	out of tendons, example	and stressing	3 1 1 1 Number of hours 15 20 7 1
T-W-5 T-W-6 Student (A-P-1 A-P-2 A-P-3 A-P-3 A-P-5 A-W-1	Pre-stressed at Cylindrical pre-stressed at Design of pre-stressed at force. Evaluati workload - form Participation ir Participation ir Individual prep Preparation for Controlled Ass Participation ir	nd post-tens -stressed co stressed or p ng of ultima os of activit n classes n consultatio paration of d r grading essment n lectures	ncrete tanks post-tensioned gir te limit state and y ns esign assignment	rder: Selection of the cracking resistance.	out of tendons, example	and stressing	3 1 1 Number of hours 15 2 20 7 1 15
T-W-5 T-W-6 Student M A-P-1 A-P-2 A-P-3 A-P-3 A-P-4 A-P-5 A-W-1 A-W-2	Pre-stressed at Cylindrical pre- Design of pre-store force. Evaluati workload - form Participation ir Participation ir Individual preparation for Controlled Ass Participation ir	nd post-tens -stressed co stressed or p ng of ultima of activit n classes n consultatio paration of d r grading essment n lectures ration – litera	ncrete tanks post-tensioned gir te limit state and y ns esign assignment	rder: Selection of the cracking resistance.	out of tendons, example	and stressing	3 1 1 Number of hours 15 20 7 1 15 20 7 15 25
T-W-5 T-W-6 Student (A-P-1 A-P-2 A-P-3 A-P-3 A-P-4 A-P-5 A-W-1 A-W-2 A-W-3	Pre-stressed at Cylindrical pre-stressed at Design of pre-stressed at force. Evaluati workload - form Participation ir Participation ir Individual prep Preparation for Controlled Ass Participation ir Lecture prepar Taking an example	nd post-tens -stressed co stressed or p ng of ultima os of activit n classes n consultatio paration of d r grading essment n lectures ration – litera m	ncrete tanks post-tensioned gir te limit state and y ns esign assignment	rder: Selection of the cracking resistance.	out of tendons, example	and stressing	3 1 1 Number of hours 15 2 20 7 1 15
T-W-5 T-W-6 Student M A-P-1 A-P-2 A-P-3 A-P-3 A-P-4 A-P-5 A-W-1 A-W-2 A-W-3 Teaching	Pre-stressed at Cylindrical pre- force. Evaluati workload - form Participation in Participation in Individual prep Preparation for Controlled Ass Participation in Lecture prepar Taking an example methods / tool	nd post-tens -stressed co stressed or p ng of ultima os of activit n classes n consultatio paration of d r grading essment n lectures ration – litera m	ncrete tanks post-tensioned gir te limit state and y ns esign assignment	rder: Selection of the cracking resistance.	out of tendons, example	and stressing	3 1 1 Number of hours 15 20 7 1 15 20 7 15 25
T-W-5 T-W-6 Student (A-P-1 A-P-2 A-P-3 A-P-3 A-P-4 A-P-5 A-W-1 A-W-2 A-W-3	Pre-stressed at Cylindrical pre-stressed at Design of pre-stressed at force. Evaluati workload - form Participation ir Participation ir Individual prep Preparation for Controlled Ass Participation ir Lecture prepar Taking an example	nd post-tens -stressed co stressed or p ng of ultima os of activit n classes n consultatio paration of d r grading essment n lectures ration – litera m	ncrete tanks post-tensioned gir te limit state and y ns esign assignment	rder: Selection of the cracking resistance.	out of tendons, example	and stressing	3 1 1 Number of hours 15 20 7 1 15 20 7 15 25
T-W-5 T-W-6 Student M A-P-1 A-P-2 A-P-3 A-P-3 A-P-4 A-P-5 A-W-1 A-W-2 A-W-3 Teaching M-1 M-2	Pre-stressed at Cylindrical pre-stressed at Design of pre-stressed at force. Evaluati workload - form Participation ir Participation ir Individual prep Preparation for Controlled Ass Participation ir Lecture prepar Taking an example methods / tool Lecture	nd post-tens -stressed co stressed or p ng of ultima is of activit in classes in consultatio paration of d r grading essment in lectures ration – litera m	ncrete tanks post-tensioned gin te limit state and y ns esign assignment ature study	rder: Selection of the cracking resistance.	out of tendons, example	and stressing	3 1 1 Number of hours 15 20 7 1 15 20 7 15 25
T-W-5 T-W-6 Student M A-P-1 A-P-2 A-P-3 A-P-3 A-P-4 A-P-5 A-W-1 A-W-2 A-W-3 Teaching M-1 M-2	Pre-stressed at Cylindrical pre-stressed at Design of pre-stressed at force. Evaluati workload - form Participation ir Participation ir Individual prep Preparation for Controlled Ass Participation ir Lecture prepar Taking an example project project promethods (F -	nd post-tens -stressed co stressed or p ng of ultima os of activit n classes n consultatio paration of d r grading essment n lectures ration – litera m	ncrete tanks post-tensioned gin te limit state and y ns esign assignment ature study	rder: Selection of the cracking resistance.	out of tendons, example	and stressing	3 1 1 Number of hours 15 20 7 1 15 20 7 15 25

Designed learning outcomes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course	e content	Teaching methods	Evaluation methods
Knowledge	•							
CE_2A_CE/C/02_W01 Understands the aim of using active reinforcement in pre- stressed and post-tensioned structures	B-A_2A_W05 B-A_2A_W06 B-A_2A_W08 B-A_2A_W10	P7S_WG_TA21	P7S_WG_IA21	C-1	T-W-1 T-W-2 T-W-3	T-W-4 T-W-5 T-W-6	M-1	S-1
Skills								
CE_2A_CE/C/02_U01 Student presents unclear data, unfinished solutions, follows the work ethics	B-A_2A_U08 B-A_2A_U10 B-A_2A_U15 B-A_2A_U21 B-A_2A_U22	P7S_UW_TA21 P7S_UW_TA24	P7S_UW_IA21 P7S_UW_IA24	C-1	T-P-1 T-W-1 T-W-2 T-W-3	T-W-4 T-W-5 T-W-6	M-2	5-2
Other social / personal competences		•						
CE_2A_CE/C/02_K01 Has awareness of the need for individual studying and upgrading professional skills	B-A_2A_K01 B-A_2A_K06	P7S_KK P7S_KR		C-1	T-P-1 T-W-1 T-W-2 T-W-3	T-W-4 T-W-5 T-W-6	M-1 M-2	S-1 S-2
Required reading								
1. Giandomenico Toniolo, Marco di Prisco, Michele Win Ta	ai Mak, Reinforce	ed Concrete D	esign to Euro	code 2,	Spring	er Verlag	g GmbH	, 2017
2. W.H. Mosley, Reinforced Concrete Design, PALGRAVE	MACMILLAN, 201	12						
3. Millais, Malcolm, Building structures : from concepts to	o design, Spon P	ress, New Yorl	<, 2005					
4. MacGregor, James Grierson, Reinforced concrete : med	chanics and desi	ign, Pearson P	rentice Hall, 2	006				
5. A. M. Neville, Properties of concrete, London, 2011								
6. Starosolski W., Konstrukcje żelbetowe, według EC2 t. I	-V, PWN, Warsza	awa, 2011						
7. EN 1992-1-1, Eurocode2 :Design of concrete structure	s - Part 1-1:Gene	eral rules and	rules for build	lings, 20	010			
8. EN 1992-3, Eurocode 2 - Design of conrete structures	- Part 3: Liquid r	etainig and co	ntaiment stru	ctures,	2006			
Supplementary reading 1. EN 1990, Eurocode - Basic of structural design, 2002								

Field of st	L										
	tuay	Civ	il Engineerin	ig							
Mode of s	study	sta	tionary	Level		second	cycle				
Graduate	's qualif	<i>fication</i> ma	gister					WBi	Α		
Area(s) or	f study	nau	ıki techniczn	ne					<u> </u>		_
Educatior	nal profi	le gei	neral academ	nic							
Module									15		
Course ur	nit	Co	mplex Meta	al Structure	S				111		
Code		WE	IA/S2CE/A/C	/02					111	ШП	
Field of s	pecialisa	ation							111		
Administe	ering fac	culty Zal	dad Teorii Ko	onstrukcji					L <u>u</u>	JLL	Ц.
ECTS		3,0		ECTS	(forms)	3,0					
Form of c	ourse ci	redit exa	mination	Langu	Jage	english		-			
Electives				Electiv	ve group			_			
Form of ir	nstructio	on Cou	le Semes	ter	Hours		ECTS	Weight		Credi	t
project co	ourse	P	1		15		1,5	0,50		credit	s
lecture		W	1		15		1,5	0,50	e>	kamina	tion
Leading t	eacher	W/r	hlowski Ton	nasz (Tomasz		 ki⊚zut er			_		
Other tea		Ab (W	amowicz Ma	ałgorzata (Ma owski@zut.eo	lgorzata.Ab	ramowic	z@zut.edu.p	ol), Paczkowsł a (Agnieszka.)		ław	
Prerequis	sites										
W-1	produc	edge of the main ts; ability to desi									
Madula/a		les of steel halls.		uct simple stee	el elements (beams, co	lumns, bearii	ngs); knowledg	e of the	basic d	esign
	ourse ui	nit objectives	-		el elements (beams, co	lumns, beariı	ngs); knowledg	e of the	basic d	esign
C-1	ourse ui Ability	nit objectives to design comple	ex metal struc	tures	el elements (beams, co	lumns, bearir	ngs); knowledg			
C-1 Course co	ourse ur Ability ontent d Design limit st	nit objectives to design comple ivided into vari of single-shell si rates and drawing	ex metal struct ous forms of reel smoke chi	tures f instruction imney or vertio	cal-cylindrica	I tank for I	iquid fuels. E	valuating of the	Nun	hber of	
C-1 Course cc T-P-1	ourse ui Ability ontent d Design limit st assem	nit objectives to design comple ivided into vari of single-shell si	ex metal struct ous forms of eel smoke chi gs preparation	tures f instruction imney or vertion (assembly, wo	cal-cylindrica	I tank for I	iquid fuels. E	valuating of the	Nun		hours
C-1 Course cc T-P-1	ourse ui Ability ontent d Design limit st assem Fractui Steel s	nit objectives to design comple <i>livided into vari</i> of single-shell si ates and drawing bly details)	ex metal struct ous forms of eel smoke chi gs preparation ontrol in Steel himneys, tank	tures f instruction imney or vertio (assembly, wo Structures (s - basic princ	cal-cylindrical orkshop secti iples of calcu	l tank for l	iquid fuels. E ed constructio	valuating of the	Num		hours 15
C-1 Course cc T-P-1 T-W-1 T-W-2	Ourse un Ability Ontent d Design limit st assem Fractun Steel s aspect	nit objectives to design comple ivided into varion of single-shell st ates and drawing bly details) re and Fatigue Co hell structures: co	ex metal struct ous forms of reel smoke chi gs preparation ontrol in Steel himneys, tank nd constructio	tures f instruction imney or vertio (assembly, wo Structures (s - basic princ	cal-cylindrical orkshop secti iples of calcu	l tank for l	iquid fuels. E ed constructio	valuating of the	Nun		hours 15 5 10
C-1 Course co T-P-1 T-W-1 T-W-2 Student w	Ability Design limit st assem Fractur Steel s aspect workloac	nit objectives to design comple ivided into vari- of single-shell st tates and drawing bly details) re and Fatigue Co hell structures: c s of the design a	ex metal struct ous forms of reel smoke chi gs preparation ontrol in Steel himneys, tank nd constructio	tures f instruction imney or vertio (assembly, wo Structures (s - basic princ	cal-cylindrical orkshop secti iples of calcu	l tank for l	iquid fuels. E ed constructio	valuating of the	Nun	nber of	hours 15 5 10
C-1 Course co T-P-1 T-W-1 T-W-2 Student v A-P-1	ourse un Ability ontent d Design limit st assem Fractun Steel s aspect workloac	nit objectives to design comple livided into vari- of single-shell si- tates and drawing bly details) re and Fatigue Co hell structures: c s of the design a	ex metal struct ous forms of reel smoke chi gs preparation ontrol in Steel himneys, tank nd constructio vity	tures f instruction imney or vertion (assembly, wo Structures cs - basic princ on of steel struc	cal-cylindrical orkshop secti iples of calcu	l tank for l	iquid fuels. E ed constructio	valuating of the	Nun	nber of	hours 15 5 10
C-1 Course co T-P-1 T-W-1 T-W-2 Student w A-P-1 A-P-2	ourse un Ability Design limit st assem Fractun Steel s aspect workload Particin Individ	nit objectives to design comple livided into varia of single-shell st tates and drawing bly details) re and Fatigue Co hell structures: co s of the design a d - forms of act pation in classes	ex metal struct ous forms of reel smoke chi gs preparation ontrol in Steel himneys, tank nd constructio vity	tures f instruction imney or vertion (assembly, wo Structures cs - basic princ on of steel struc	cal-cylindrical orkshop secti iples of calcu	l tank for l	iquid fuels. E ed constructio	valuating of the	Nun	nber of	hours 15 5 10 hours 15
C-1 Course co T-P-1 T-W-1 T-W-2 Student v A-P-1 A-P-2 A-P-3 A-W-1	ourse un Ability Design limit st assem Fractur Steel s aspect workload Particip Individ Contro Particip	nit objectives to design comple- ivided into vari- of single-shell si- tates and drawing bly details) re and Fatigue Co- hell structures: co- s of the design a d - forms of act- pation in classes ual preparation co- lled assessment pation in lectures	ex metal struct ous forms of eel smoke chi gs preparation ontrol in Steel himneys, tank nd constructio vity f design assig	tures f instruction imney or vertio (assembly, wo Structures s - basic princ on of steel struc	cal-cylindrical orkshop secti iples of calcu	l tank for l	iquid fuels. E ed constructio	valuating of the	Nun	nber of	hours 15 10 hours 15 28
C-1 Course co T-P-1 T-W-1 T-W-2 Student w A-P-1 A-P-2 A-P-3 A-W-1 A-W-2	Ability Design limit st assem Fractur Steel s aspect workload Particip Individ Contro Particip Lectur	nit objectives to design comple- livided into vari- of single-shell si- tates and drawing- bly details) re and Fatigue Co- hell structures: co- s of the design a d - forms of act- pation in classes ual preparation co- lled assessment pation in lectures e preparation - lit	ex metal struct ous forms of eel smoke chi gs preparation ontrol in Steel himneys, tank nd constructio vity f design assig	tures f instruction imney or vertio (assembly, wo Structures s - basic princ on of steel struc	cal-cylindrical orkshop secti iples of calcu	l tank for l	iquid fuels. E ed constructio	valuating of the	Nun	nber of	hours 15 5 10 hours 28 2 15 25
C-1 Course co T-P-1 T-W-1 T-W-2 Student w A-P-1 A-P-2 A-P-3 A-W-1 A-W-2	Ability Design limit st assem Fractur Steel s aspect workload Particip Individ Contro Particip Lectur	nit objectives to design comple- ivided into vari- of single-shell si- tates and drawing bly details) re and Fatigue Co- hell structures: co- s of the design a d - forms of act- pation in classes ual preparation co- lled assessment pation in lectures	ex metal struct ous forms of eel smoke chi gs preparation ontrol in Steel himneys, tank nd constructio vity f design assig	tures f instruction imney or vertio (assembly, wo Structures s - basic princ on of steel struc	cal-cylindrical orkshop secti iples of calcu	l tank for l	iquid fuels. E ed constructio	valuating of the	Nun	nber of	hours 15 5 10 hours 15 28 2 2 15
C-1 Course co T-P-1 T-W-1 T-W-2 Student w A-P-1 A-P-2 A-P-3 A-W-1 A-W-2 A-W-2 A-W-3 Teaching	ourse un Ability Design limit st assem Fractur Steel s aspect workload Particip Individ Contro Particip Lecturd Taking	nit objectives to design comple- ivided into vari- of single-shell si- tates and drawing- bly details) re and Fatigue Co- hell structures: co- s of the design a d - forms of act- pation in classes ual preparation of lled assessment pation in lectures e preparation - lift an exam	ex metal struct ous forms of eel smoke chi gs preparation ontrol in Steel himneys, tank nd constructio vity f design assig	tures f instruction imney or vertio (assembly, wo Structures s - basic princ on of steel struc	cal-cylindrical orkshop secti iples of calcu	l tank for l	iquid fuels. E ed constructio	valuating of the	Nun	nber of	hours 15 10 hours 28 2 15 25
C-1 Course co T-P-1 T-W-1 T-W-2 Student v A-P-1 A-P-2 A-P-3 A-V-1 A-W-2 A-W-3 Teaching M-1	Ourse un Ability Design limit st assem Fractur Steel s aspect vorkload Particip Individ Contro Particip Lecture method	nit objectives to design comple- livided into vari- of single-shell st lates and drawing- bly details) re and Fatigue Co- hell structures: co- s of the design a d - forms of act bation in classes ual preparation of lied assessment bation in lectures e preparation - lift an exam ds / tools e	ex metal struct ous forms of eel smoke chi gs preparation ontrol in Steel himneys, tank nd constructio vity f design assig	tures f instruction imney or vertio (assembly, wo Structures s - basic princ on of steel struc	cal-cylindrical orkshop secti iples of calcu	l tank for l	iquid fuels. E ed constructio	valuating of the	Nun	nber of	hours 15 10 hours 28 2 15 25
C-1 Course co T-P-1 T-W-1 T-W-2 Student v A-P-1 A-P-2 A-P-3 A-V-1 A-W-2 A-W-3 Teaching M-1	Ourse un Ability Design limit st assem Fractur Steel s aspect Vorkloac Particip Individ Contro Particip Lectur Taking	nit objectives to design comple- livided into vari- of single-shell st lates and drawing- bly details) re and Fatigue Co- hell structures: co- s of the design a d - forms of act bation in classes ual preparation of lied assessment bation in lectures e preparation - lift an exam ds / tools e	ex metal struct ous forms of eel smoke chi gs preparation ontrol in Steel himneys, tank nd constructio vity f design assig	tures f instruction imney or vertio (assembly, wo Structures s - basic princ on of steel struc	cal-cylindrical orkshop secti iples of calcu	l tank for l	iquid fuels. E ed constructio	valuating of the	Nun	nber of	hours 15 10 hours 28 2 15 25
C-1 Course co T-P-1 T-W-1 T-W-2 Student w A-P-1 A-P-2 A-P-3 A-W-1 A-W-2 A-W-3 Teaching M-1 M-2	Ourse un Ability Design limit st assem Fractur Steel s aspect Workload Particip Individ Contro Particip Lecture Taking Method Project	nit objectives to design comple- livided into vari- of single-shell st lates and drawing- bly details) re and Fatigue Co- hell structures: co- s of the design a d - forms of act bation in classes ual preparation of lied assessment bation in lectures e preparation - lift an exam ds / tools e	ex metal struct ous forms of reel smoke chi gs preparation ontrol in Steel himneys, tank nd constructio vity of design assig erature study	tures f instruction imney or vertio (assembly, wo Structures cs - basic princ on of steel struc	cal-cylindrical orkshop secti iples of calcu	l tank for l	iquid fuels. E ed constructio	valuating of the	Nun	nber of	hours 15 10 hours 28 2 15 25
C-1 Course co T-P-1 T-W-1 T-W-2 Student w A-P-1 A-P-2 A-P-3 A-W-1 A-W-2 A-W-3 Teaching M-1 M-2 Evaluation S-1	Ourse un Ability Design limit st assem Fractur Steel s aspect Workload Particip Individ Contro Particip Lecture Taking Method Project	nit objectives to design comple- livided into vari- of single-shell si- tates and drawing- bly details) re and Fatigue Co- hell structures: co- s of the design a d - forms of act- bation in classes ual preparation co- lied assessment bation in lectures e preparation - life an exam	ex metal struct ous forms of reel smoke chi gs preparation ontrol in Steel himneys, tank nd constructio vity of design assig rerature study sive, P - fina	tures f instruction imney or vertio (assembly, wo Structures (s - basic princ on of steel structures (s - basic princ on of steel structures)	cal-cylindrical orkshop secti iples of calcu	l tank for l	iquid fuels. E ed constructio	valuating of the	Nun	nber of	hours 15 5 10 hours 28 2 15 25
C-1 Course co T-P-1 T-W-1 T-W-2 Student w A-P-1 A-P-2 A-P-3 A-W-1 A-W-2 A-W-3 Teaching M-1 M-2	ourse ur Ability Design limit st assem Fractur Steel s aspect vorkload Particip Individ Contro Particip Lecture Taking method Project n method	nit objectives to design comple- livided into vari- of single-shell st ates and drawing bly details) re and Fatigue Co- hell structures: co- s of the design a d - forms of act bation in classes ual preparation of lied assessment bation in lectures e preparation - lift an exam ds / tools e cods (F - progress	ex metal struct ous forms of reel smoke chi gs preparation ontrol in Steel himneys, tank nd constructio vity if design assig rerature study sive, P - fina crolled assign	tures f instruction imney or vertio (assembly, wo Structures (s - basic princ on of steel structures (s - basic princ) (s - ba	cal-cylindrical orkshop secti iples of calcu	l tank for l	iquid fuels. E ed constructio	valuating of the	Nun	nber of	hours 15 5 10 hours 15 28 2 15 25
C-1 Course co T-P-1 T-W-1 T-W-2 Student w A-P-1 A-P-2 A-P-3 A-W-1 A-W-2 A-W-3 Teaching M-1 M-2 Evaluation S-1	Ourse un Ability Design limit st assem Fractur Steel s aspect vorkload Particip Individ Contro Particip Lecture Taking method Project P P P	nit objectives to design comple- ivided into vari- of single-shell si- tates and drawing bly details) re and Fatigue Co- hell structures: of s of the design a d - forms of act bation in classes ual preparation of led assessment bation in lectures e preparation - lift an exam ds / tools e bads (F - progress Passing the con	ex metal struct ous forms of reel smoke chi gs preparation ontrol in Steel himneys, tank nd constructio vity f design assig erature study sive, P - fina crolled assignr m	tures f instruction imney or vertic (assembly, we Structures s - basic princ on of steel struc gnment)) ment Referee learning designed for	cal-cylindrical orkshop secti iples of calcu ctures	l tank for l	iquid fuels. E ed constructio	valuating of the on and . Non-technical	Nun	nber of	hours 15 5 10 hours 28 2 15 25

CE_2A_A/C/03_W01 The student is able to distinguish and define forms of destruction of steel construction elements. The student is able to define types of steel shell constructions and propose their correct construction solutions using appropriate standards and technical standards.	B-A_2A_W08 B-A_2A_W10	P7S_WG_TA21	P75_WG_IA21	C-1	T-P-1 T-W-1	T-W-2	M-1 M-2	S-1 S-2
Skills								
CE_2A_A/C/03_U01 The student can use selected CAD programs to compile technical documentation of simple and complex steel shell structures. The student is able to design steel structures in accordance with a predefined specification.	B-A_2A_U08 B-A_2A_U14 B-A_2A_U22	P7S_UW_TA24	P7S_UW_IA24	C-1	T-P-1		M-2	S-1
Other social / personal competences								
CE_2A_A/C/03_K01 Student has awareness of the need for individual studying and upgrading professional skills	B-A_2A_K02 B-A_2A_K03	P7S_KK		C-1	T-P-1 T-W-1	T-W-2	M-2	S-1
Required reading								
1. Darko Beg, Ulrike Kuhlmann, Laurence Davaine, Benja Part 1-5: Design of Plated Structures, Wiley, Berlin, 2010	min Braun, Des	ign of Plated S	tructures: Euro	ocode	3: Desig	gn of Ste	el Struc	tures,
Supplementary reading								
1. Michel Bruneau, Chia-Ming Uang, Andrew Whittaker, D	uctile design of	steel structure	es, McGraw Hi	ll Profe	essional	, Boston,	1998	
2. Leroy Gardner and David A. Nethercot, Designers' guid Publishing, London, 2011	de to Eurocode	3 : design of st	eel buildings :	EN 19	93-1-1,	-1-3 and	d -1-8, IO	CE

Field of s	study	Civil E	Engineering				
Mode of	study	statio	nary	Level	second cycle		
Graduat	e's qualification	magis	ster			WBiA	4
Area(s)	of study	nauki	techniczne				
Educatio	onal profile	genei	ral academic			_	
Module						-	n ILn I
Course ι			tural Dynami	cs		-	
Code		WBIA	/S2CE/A/C/03			- (II	
Field of s	specialisation						
Adminis			d Teorii Konstru	-			
ECTS		3,0		ECTS (forms)	3,0		
Form of	course credit	exam	ination	Language	english		
Electives	s			Elective group			
Form of	instruction	Code	Semester	Hours	ECTS	Weight	Credit
project o	course	Р	2	15	1,5	0,50	credits
lecture		W	2	30	1,5	0,50	examination
Leading	teacher	Iwank	ciewicz Radosłav	w (riwankiewicz@:	zut.edu.pl)		
Other te	eachers	Webe	er Hanna (Hanna	a.Weber@zut.edu.	pl)		
Prerequi	isites						
W-1	Mathematics course	es per	tinent to BSc in E	ngineering degree o	course		
W-2	Structural Mechanic	S					
Module/	course unit objective						
C-1	Capability to write d	down tl . the .r	he equations of m principle of angula	notion of single- and or momentum and L	multi-degree-of-freedo agrange's equations as	m linear systems	with the aid of to determine the
	natural frequency o	f single	e-degree-of-freed	om systems.			
C-2	multi-degree-of-free	edom s	systems.		etermine the natural fr		-
С-3	Capability to determ and some non-perio			response of single	- and multi-degree-of-f	reedom linear syst	ems to harmonic
C-4		ate the		m and to dotormino			
Course o	content divided into v		plane frames.		the critical load for rod	s (columns) with c	lifferent boundary
T-P-1		variou	•		the critical load for rod	s (columns) with c	-
			s forms of instr	uction	the critical load for rod		Number of hours
	frequency.	deriva	s forms of instruction of equations	uction of motion of SDOF s	ystems, determination		Number of hours
Т-Р-2 Т-Р-3	frequency. Example problems:	deriva deriva	is forms of instru- tion of equations ation of equations	uction of motion of SDOF s of motion of MDOF	ystems, determination systems.	of natural	Number of hours
T-P-2	frequency. Example problems: Solving eigenvalue	deriva deriva proble	is forms of instru- tion of equations ation of equations m for MDOF syste	uction of motion of SDOF s of motion of MDOF ems, determination of	ystems, determination	of natural nd eigenvectors.	Number of hours 2 3
Т-Р-2 Т-Р-3	frequency. Example problems: Solving eigenvalue Determination of an Determination of cri	deriva deriva proble nplituc	is forms of instru- tion of equations ation of equations m for MDOF syste les of steady-state	uction of motion of SDOF s of motion of MDOF ems, determination of e response of a MDC	ystems, determination systems. of natural frequencies a	of natural nd eigenvectors. excitation.	Number of hours 2 3 5
Т-Р-2 Т-Р-3 Т-Р-4	frequency. Example problems: Solving eigenvalue Determination of an Determination of cri plane frames. Degrees of freedom motion: Newton'sec	deriva deriva proble nplituc itical lo n and g	is forms of instru- tion of equations ation of equations m for MDOF syste les of steady-state oad for rods (colur eneralized co-ord	uction of motion of SDOF s of motion of MDOF ems, determination of e response of a MDC mns) with different t inates. Constraints a	ystems, determination systems. of natural frequencies a DF system to harmonic	of natural Ind eigenvectors. excitation. d for simple . Equations of	Number of hours 2 3 5 1
T-P-2 T-P-3 T-P-4 T-P-5	frequency. Example problems: Solving eigenvalue Determination of an Determination of cri plane frames. Degrees of freedom motion: Newton'sec superposition. Single-degree-of-fre Forced vibrations: h	deriva deriva proble nplituc itical lo and g cond la eedom armon	is forms of instru- tion of equations ation of equations m for MDOF syste les of steady-state bad for rods (colur eneralized co-ord w and principle of (SDOF) systems:	uction of motion of SDOF s of motion of MDOF ems, determination of e response of a MDO mns) with different t inates. Constraints a f angular momentun equation of motion,	systems, determination systems. of natural frequencies a DF system to harmonic boundary conditions an and their combinations	of natural and eigenvectors. excitation. d for simple . Equations of and their d free vibrations.	Number of hours 2 3 5 1 4
T-P-2 T-P-3 T-P-4 T-P-5 T-W-1	frequency. Example problems: Solving eigenvalue Determination of an Determination of cri plane frames. Degrees of freedom motion: Newton'sec superposition. Single-degree-of-free	deriva deriva proble nplituc itical lo and g cond la eedom armon cions.	is forms of instru- tion of equations ation of equations m for MDOF syste les of steady-state bad for rods (colur eneralized co-ord w and principle of (SDOF) systems:	uction of motion of SDOF s of motion of MDOF ems, determination of e response of a MDO mns) with different t inates. Constraints a f angular momentun equation of motion,	systems, determination systems. of natural frequencies a DF system to harmonic boundary conditions an and their combinations n. Oscillatory motions a undamped and dampe	of natural and eigenvectors. excitation. d for simple . Equations of and their d free vibrations.	Number of hours 2 3 5 1 4 3
T-P-2 T-P-3 T-P-4 T-P-5 T-W-1 T-W-2	frequency. Example problems: Solving eigenvalue Determination of an Determination of cri plane frames. Degrees of freedom motion: Newton'sec superposition. Single-degree-of-free Forced vibrations: h non-periodic excitat Lagrange's equatior Multi-degree-of-free	deriva deriva proble nplituc itical la cond la cond la eedom armon cions. ns. edom (i , eigen	is forms of instru- tion of equations ation of equations m for MDOF syste les of steady-state oad for rods (colur eneralized co-ord w and principle of (SDOF) systems: ic excitation, exci- MDOF) systems: e vectors), damping	uction of motion of SDOF s of motion of MDOF ems, determination of e response of a MDC mns) with different t inates. Constraints a f angular momentun equation of motion, itation due to rotatir equations of motion, g hypotheses. Force	systems, determination systems. of natural frequencies a DF system to harmonic boundary conditions an and their combinations n. Oscillatory motions a undamped and dampe	of natural ind eigenvectors. excitation. d for simple . Equations of and their d free vibrations. tion excitation,	Number of hours 2 3 5 1 4 3 6
T-P-2 T-P-3 T-P-4 T-P-5 T-W-1 T-W-2 T-W-2	frequency. Example problems: Solving eigenvalue Determination of an Determination of cri plane frames. Degrees of freedom motion: Newton'sec superposition. Single-degree-of-free Forced vibrations: h non-periodic excitat Lagrange's equatior Multi-degree-of-free natural frequencies, transformation tech	deriva deriva proble nplituc itical la itical la cond la eedom armon cions. ns. edom (i , eigen nique ns of a	IS forms of instru- tion of equations ation of equations m for MDOF syste les of steady-state bad for rods (colur eneralized co-ord w and principle of (SDOF) systems: ic excitation, exci- sic excitation, exci- for harmonic exci- beam: equation of	uction of motion of SDOF s of motion of MDOF ems, determination of e response of a MDO mns) with different t inates. Constraints a f angular momentun equation of motion, itation due to rotatir equations of motion, g hypotheses. Force tation.	ystems, determination systems. of natural frequencies a DF system to harmonic boundary conditions an and their combinations n. Oscillatory motions a undamped and dampe ng unbalance, base mo eigenvalue problem (e d vibrations: direct app e problem (eigenvalue	of natural ind eigenvectors. excitation. d for simple . Equations of and their d free vibrations. tion excitation, igenvalues, roach and modal	Number of hours 2 3 5 1 4 3 6 2
T-P-2 T-P-3 T-P-4 T-P-5 T-W-1 T-W-2 T-W-2 T-W-3 T-W-4	frequency. Example problems: Solving eigenvalue Determination of an Determination of cri plane frames. Degrees of freedom motion: Newton'sec superposition. Single-degree-of-free Forced vibrations: h non-periodic excitat Lagrange's equatior Multi-degree-of-free natural frequencies, transformation tech	deriva deriva proble nplituc itical lo and g cond la eedom armon ions. ns. edom (i , eigen nique ns of a unctior	IS forms of instru- tion of equations ation of equations m for MDOF syste les of steady-state bad for rods (colur eneralized co-ord w and principle of (SDOF) systems: ic excitation, exci- sic excitation, exci- beam: equation of s – normal modes	uction of motion of SDOF s of motion of MDOF ems, determination of e response of a MDO mns) with different t inates. Constraints a f angular momentun equation of motion, itation due to rotatir equations of motion, g hypotheses. Force tation.	ystems, determination systems. of natural frequencies a DF system to harmonic boundary conditions an and their combinations n. Oscillatory motions a undamped and dampe ng unbalance, base mo eigenvalue problem (e d vibrations: direct app e problem (eigenvalue	of natural ind eigenvectors. excitation. d for simple . Equations of and their d free vibrations. tion excitation, igenvalues, roach and modal	Number of hours 2 3 5 1 4 3 6 2 8
T-P-2 T-P-3 T-P-4 T-P-5 T-W-1 T-W-2 T-W-2 T-W-3 T-W-4 T-W-5	frequency. Example problems: Solving eigenvalue Determination of an Determination of criplane frames. Degrees of freedom motion: Newton'sec superposition. Single-degree-of-free Forced vibrations: h non-periodic excitat Lagrange's equation Multi-degree-of-free natural frequencies, transformation tech Transverse vibration Stability of equilibriu	deriva deriva proble nplituc itical lo a and g cond la eedom armon cions. ns. edom (i , eigen ns of a unctior um po	s forms of instru- tion of equations ation of equations m for MDOF syste les of steady-state bad for rods (colur eneralized co-ord w and principle of (SDOF) systems: ic excitation, exci- bic excitation, exci- beam: equation of beam: equation of s – normal mode sitions.	uction of motion of SDOF s of motion of MDOF ems, determination of e response of a MDC mns) with different t inates. Constraints a f angular momentum equation of motion, itation due to rotatir equations of motion, g hypotheses. Force tation. of motion, eigenvalu s), different boundar	ystems, determination systems. of natural frequencies a DF system to harmonic boundary conditions an and their combinations n. Oscillatory motions a undamped and dampe ng unbalance, base mo eigenvalue problem (e d vibrations: direct app e problem (eigenvalue	of natural ind eigenvectors. excitation. d for simple . Equations of ind their d free vibrations. tion excitation, iigenvalues, iroach and modal s, natural	Number of hours 2 3 5 1 4 3 6 2 8 3
T-P-2 T-P-3 T-P-4 T-P-5 T-W-1 T-W-2 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 T-W-7	frequency. Example problems: Solving eigenvalue Determination of an Determination of criplane frames. Degrees of freedom motion: Newton'sec superposition. Single-degree-of-free Forced vibrations: h non-periodic excitat Lagrange's equation Multi-degree-of-free natural frequencies, transformation tech Transverse vibration Stability of equilibriu Structural stability:	deriva deriva proble nplituc itical la itical la cond la eedom armon cions. ns. edom ((, eigen nique ns of a unctior um poi bucklin	Is forms of instru- tion of equations ation of equations m for MDOF syste les of steady-state bad for rods (colur eneralized co-ord w and principle of (SDOF) systems: ic excitation, exci- tic excitation, exci- for harmonic exci- beam: equation of s – normal modes sitions. ng of elastic rods	uction of motion of SDOF s of motion of MDOF ems, determination of e response of a MDC mns) with different t inates. Constraints a f angular momentum equation of motion, itation due to rotatir equations of motion, g hypotheses. Force tation. of motion, eigenvalu s), different boundar	systems, determination systems. of natural frequencies a DF system to harmonic boundary conditions an and their combinations n. Oscillatory motions a undamped and dampe ing unbalance, base mo eigenvalue problem (ei d vibrations: direct app re problem (eigenvalue ry conditions.	of natural ind eigenvectors. excitation. d for simple . Equations of ind their d free vibrations. tion excitation, iigenvalues, iroach and modal s, natural	Number of hours 2 3 5 1 4 3 6 2 8 3

Student v	workload	l - forms of activity						Nun	nber of	hours
A-P-2	Private	e (home) study.								20
A-P-3	Home	assignments (two major assignments	5).							10
A-W-1	Attend	ing the lectures.								30
A-W-2	Private	e (home) study.								10
A-W-3	Studyi	ng/revision for the final exam.								5
Teaching	g method	ls / tools								
M-1	Lectur	es.								
M-2	Solving	problems and home assignments.								
Evaluatic	on metho	ods (F - progressive, P - final)								
S-1	Р	Final exam mark.								
S-2	F	Assessment of home assignments.								
	Desigr	ned learning outcomes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Cours	e content	Teaching methods	Evaluation methods
Knowledg	ge									
	ould be abl	e to develop simple mathematical models and to formulate the buckling problems.	B-A_2A_W01	P75_WG_TA21	P7S_WG_IA21	C-1 C-2 C-3 C-4	T-P-1 T-P-2 T-P-3 T-P-4 T-P-5 T-W-1	T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 T-W-7	M-1 M-2	S-1 S-2
Skills										
problems ar He/she shou	ould be abl nd equatio uld also be	e to solve numerically the eigenvalue ns of motion in vibration problems. able to solve the equations g problems.	B-A_2A_U01	P7S_UK		C-1 C-2 C-3 C-4	T-P-1 T-P-2 T-P-3 T-P-4 T-P-5 T-W-1	T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 T-W-7	M-1 M-2	S-1 S-2
Other so	cial / per	rsonal competences								
B-A_2A_A/C, Student sho research/co deadlines.	ows the cap	pability to make a plan for an undertaken al project, to execute it and to observe	B-A_2A_K01	P7S_KK		C-1 C-2 C-3 C-4	T-P-1 T-P-2 T-P-3 T-P-4 T-P-5 T-W-1	T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 T-W-7	M-1 M-2	S-1 S-2
Required	l reading	1								
1. W.C. H	lurty and	M.F. Rubinstein, Dynamics of Structu	ires, Englewood	Cliffs: Prentice	Hall, 1964					
2. S.S. Rad	o, Mechai	nical Vibrations, Addison-Wesley, 199	5, 3rd edition							
3. C.F. Bea	ards, Eng	ineering Vibration Analysis with Appli	cation to Control	Systems, Edv	vard Arnold, 1	995				
4. M. Gera	adin, D.Ri	xen, Mechanical Vibrations. Theory a	nd Application to	Structural Dy	namics, J. Wile	ey, 1994	4			

Field of st	udy	Civil E					
Mode of s	tudy	statio	nary	Level	second cycle		
Graduate	's qualification	magis	ster	1		WBi/	Δ
Area(s) of	f study	nauki	techniczne			vvD1/	\
Education	-	gener	al academic				
Module		J				-	
Course ur	nit	Spec	ial Foundatior	15		-	
Code		-	/S2CE/A/C/04			-	
	pecialisation		5202/7/0/04			- \	
-	ering faculty	Katod	lra Geotechniki				
ECTS		2,0		ECTS (forms)	2,0		
				ECTS (forms)		_	
	ourse credit	credit	S	Language	english		
Electives				Elective group			1
Form of ir	nstruction	Code	Semester	Hours	ECTS	Weight	Credit
project co	ourse	Р	2	15	1,0	0,50	credits
lecture		w	2	15	1,0	0,50	credits
Leading to	eacher	Pozlev	wicz Andrzej (Ar	ndrzej.Pozlewicz@	zut.edu.pl)		-
Other tea	chers				-		
Prerequis	ites						
W-1	Soil mechanics						
W-2	Engineering geolog	iv.					
W-3	Foundation design						
Module/co	ourse unit objectiv	<u>م</u>					
C-1			nize and use of pro	oper foundation in c	ase of massive constru	iction and comple	x load systems
C-2				design of special fou			
Course co	ntent divided into	variou	s forms of instr	uction			Number of hours
T-P-1				otechnical conditions	5		15
T-W-1	Advanced geotech		• •				1
T-W-2	Load transfer mech						2
T-W-3	Meyerhof's method	l for bor	red and displacem	nent driven piles			1
T-W-4	"Alpha", "lambda"	and "be	tha" methods for	shafts and piers			1
T-W-5	Elastic foundation						2
T-W-6	Test loads, Davisso	on formu	ulae				1
T-W-7	Negative skin fricti						1
T-W-8	Group of piles, drill						1
T-W-9	Brich Hansen meth						1
T-W-10					and Matlock, Broms a	pproaches)	2
T-W-11	Anchoring systems			sign			2
	vorkload - forms of		-				Number of hours
A-P-1	presence on projec						15
A-P-2	single-handed worl	k on des	sign project task				10
A-P-3 A-P-4	consultances	iect cor	moletion correction	on of calculation and	l drawings mistakes		2
А-Р-4 А-Р-5	completion of proje	-			a arawings mistakes		1
A-P-5 A-W-1	presence on lectur						15
A-W-1 A-W-2			foundations desi	gn items given durir	a lectures		3
A-W-3					and with literature stu	ıdies	3
A-W-4					dowienia w czasie kon		4
A-W-5	preparation for lect			· ·			5
	-		-				1

Student w	vorkloa	d - forms of activity						Num	nber of	hours
A-W-6	compl	etion of lectures								1
Teaching	metho	ds / tools								
M-1	Projec	t based learning method								
М-2	Lectur	e, case studies								
Evaluatio	n meth	ods (F - progressive, P - final)								
S-1	F	Project work								
S-2	F	continuous assessment								
S-3	Р	Project presentation and defence								
	Desig	ned learning outcomes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Cours	e content	Teaching methods	Evaluation methods
Knowledg	e		I	1	1	1				1
not standard	ws syster	ns of modern foundations design in case of tion	B-A_2A_W08	P7S_WG_TA21	P7S_WG_IA21	C-1 C-2	T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5	T-W-6 T-W-7 T-W-8 T-W-9 T-W-10 T-W-11	M-1 M-2	S-1 S-2 S-3
Skills										
special found	ole to: an dations, p	alyze geotechnical solutions for various provide comparative analysis for given lations of bearing capacity of a special	B-A_2A_U15 B-A_2A_U20	P7S_UW_TA24		C-1 C-2	T-P-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-5	T-W-7 T-W-8 T-W-9 T-W-10 T-W-11	M-1 M-2	S-1 S-2 S-3
Other soc	ial / pe	rsonal competences	-	•						
gained know	ple in bot ledge an dations e	h professional and responsible way use d skills in executions works associated with ngineering. Understands the engineering vironment	B-A_2A_K03	Р75_КК		C-1 C-2	T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5	T-W-6 T-W-7 T-W-8 T-W-9 T-W-10 T-W-11	M-1 M-2	S-1 S-2 S-3
Required	reading	9	-	·						
		ndation Analysis and Design, McGraw	-Hill, 1996, Knov	el Release Da	te 2007-01-02	2				
2. Budhu M	1., Soil M	lechanics and Foundations, John Wile	y & Sons, 2007, I	Knovel Release	e Date: Aug 5,	2009,	Earth S	ciences		
3. Cashma	n P. M.,	Preene M., Groundwater Lowering in	Construction. A p	ractical guide	, Spon Press,	London	New Y	′ork, 200)1	
4. Cernica	J. N., Ge	otechnical Engineering: Foundation D	esign, John Wiley	/ & Sons, New	York, 1995					
		dation Engineering Handbook - Desig te: 2006-08-09	n and Construction	on with the 20	06 Internatior	nal Build	ding Co	de, McG	raw-Hil	l, 2006,
6. Monaha	n E. J., C	onstruction of Fills, John Wiley & Sons	, 1994, 2, Knove	l Release Date	e: 2007-08-22					
7. Smith I.,	Smith's	Elements of Soil Mechanics. 8th Edit	on. Design to Eu	rokode 7, Blac	kwell Publishi	ing, Oxf	ord, 20	06, 8, V	III-114	
8. Tomlins	on M. J.,	Foundation Design and Construction,	Prentice Hall, Ha	arlow, 2001, 7						
9. Venkatra	amaiah	C., Geotechnical Engineering, John Wi	ley & Sons, 1993							
Suppleme 1. De Cock		eading and C. (Eds.), Design of Axially Loade	d Piles. Europea	n Practice, A. A	A. Balkema, R	otterda	m, 199	7		
	9	· · · · · · · · · · · · · · · · · · ·			,					

Course unit Computer Methods Code WBIA/S2CE/A/C/05 Field of specialisation Administering faculty Zaklad Teorii Konstrukcji ECTS 2.0 ECTS (forms) 2.0 Form of course credit credits Language english Electives Elective group Outside the second seco												
Graduate's qualification magister Mere(3) 05 study nauki techniczne Sicuzational profile general academic Module	Field of s	tudy		Civil E	Engineering							
Markads) of study nauki techniczne Selucational profile general academic Module	Mode of s	study		statio	nary	Level	second	cycle				
Markads) of study nauki techniczne Selucational profile general academic Module	Graduate	's qualifi	cation	magis	ster				V	VRiA		
Module Computer Methods Correct unit Computer Methods Correct unit WBIA/S2CE/A/C(05 Field of specialisation Administering faculty Zaklad Teorii Konstrukcji SECTS 2.0 ECTS (forms) 2.0 Form of course credit credits Language english Electives Elective group Elective group Credit Form of instruction Code Semester Hours ECTS Weight Credits Eactives Elective group Distruction 0.50 credits ecture W 2 15 1.0 0.50 credits ecture W 2 15 1.0 0.50 credits ecture W 2 15 1.0 0.50 credits Percequistes Silicka Ewa (Ewa Silicka@cut.edu.pl) Distructures. Credits Credits Course content divided into various forms of instructures Module/course unit dojectives Course content divide into various system and finite-difference method. A A FP-1 Analysis of plate stystes structure by ARSA sy	Area(s) o	f study		nauki	techniczne							_
Course unit Computer Methods Code WBIA/SZCE/A/C/05 Field of specialisation Administering faculty Zaklad Teorii Konstrukcji ECT 2.0 ECTS (forms) 2.0 Form of course credit credits Language english Electives Elective group Form of instruction Code Semester Hours ECTS Weight Credit cading tacher Silicka Ewa (Ewa.Silicka@zut.edu.pl) 0,50 credits cedits cading tacher Silicka Ewa (Ewa.Silicka@zut.edu.pl) Other teachers Silicka Ewa (Ewa.Silicka@zut.edu.pl) Order of mathematic. Module/course unit objectives Causa to nalysis of plate bar system by matrix displacement methods. Number of hours Causa controt divided into various forms of instruction Mumber of hours Causa to nalysis of plate bar system by matrix displacement methods.	Educatior	nal profile	e	genei	ral academic							
Code WBIA/SZCE/A/C/05 Field of specialisation Administering faculty Zaklad Teorii Konstrukcji ECTS 2.0 ECTS (forms) 2.0 Form of course credit credits Language english Form of instruction Code Semester Hours ECTS Weight Credit Form of instruction Code Semester Hours ECTS Weight Credit Form of instruction Code Semester Hours ECTS Weight Credits ecture W 2 15 1.0 0.50 credits ecture W 2 15 1.0 0.50 credits Perceptists Silicka Ewa (Ewa.Silicka@zut.edu.pl) Descredits Credits Credits Modulecourse unit objectives Silicka forms of instruction Number of hours Number of hours F/P-1 Analysis of plate bar system by matrix displacement methods. Multiplate bar system by matrix displacement method. 4 F/P-3 Analysis of plate stress structure by ASA system.Influence of mesh on results improvement. 2 F/P-4	Module									- 11		
Code WBIA/S2CE/A/C/05 Field of specialisation Administering faculty Zakład Teorii Konstrukcji SCTS 2.0 ECTS (forms) 2.0 Form of course credit credits Language english Form of instruction Code Semester Hours ECTS Weight Credit Form of instruction Code Semester Hours ECTS Weight Credit scopect course P 2 15 1.0 0.50 credits ecture W 2 15 1.0 0.50 credits ecture W 2 15 1.0 0.50 credits Perequisites W 2 15 1.0 0.50 credits Perequisites Multip to proper numerical methods according to static analysis of engineering structures. Course content divided into various forms of instruction Number of hours Call Acquaintance with popular numerical methods according to static analysis of engineering structures. 4 4 Call Analysis of plate bar system by finite difference method. 2 4 <t< td=""><td>Course ui</td><td>nit</td><td></td><td>Com</td><td>outer Methods</td><td></td><td></td><td></td><td></td><td>- 11</td><td></td><td>11.</td></t<>	Course ui	nit		Com	outer Methods					- 11		11.
Field of specialisation Zaklad Teorii Konstrukcji Administering faculty Zaklad Teorii Konstrukcji 2.0 ECTS 2.0 ECTS (forms) 2.0 Form of course credit credits Language english Electives Elective group Elective group credit Form of instruction Code Semester Hours ECTS Weight Credit aroject course P 2 15 1.0 0.50 credits ecture W 2 15 1.0 0.50 credits ecture W 2 15 1.0 0.50 credits ecture W 2 15 1.0 0.50 credits Perequisites Vi Passed course of mathematic. Module/course unit objectives Number of hours Alapist to proper numerical definition and analysis of engineering structures by commercial systems. Verification of instruction Number of hours Course content divided into various forms of instruction Number of hours 4 4 FA-2 Analysis of plate by ARSA system. Influence of meshon results	Code									- 11	11 11 1	11
Administering faculty Zaklad Teorii Konstrukcji Construkcji Construkcji ECTS 2.0 ECTS (forms) 2.0 Form of course credit credits Language english Form of instruction Code Semester Hours ECTS Weight Credit Form of instruction Code Semester Hours ECTS Weight Credit Form of instruction Code Semester Hours ECTS Weight Credit Form of instruction Code Semester Hours ECTS Weight Credits eading teacher Silicka Ewa (Ewa.Silicka@gut.edu.pl) Deterteachers Silicka Ewa (Ewa.Silicka@gut.edu.pl) Deterteachers Silicka Ewa (Ewa.Silicka@gut.edu.pl) Prerequisites // 1 Requaintance with popular numerical definition and analysis of regineering structures. Acquaintance with popular numerical definition and analysis of regineering structures. August of plate stress structure by ARSA system. Influence of mesh on results improvement. 2 Creve content divided into various forms of instruction Number of hours. 3 3 Creve S Static analysis of plate stress structure by ARSA system and fi	Field of s	pecialisa	tion						1	- 11		
ECTS 2,0 ECTS (forms) 2,0 Form of course credit credits Language english Electives Elective group Elective group Form of instruction Code Semester Hours ECTS Weight Credits Form of instruction Code Semester Hours ECTS Weight Credits corpolect course P 2 15 1.0 0.50 credits ecture W 2 15 1.0 0,50 credits eading teacher Silicka Ewa (Ewa.Silicka@zut.edu.pl) Prerequisites Prerequisites Prerequisites #/1 Passed course of mathematic. Module/course unit objectives Number of hours Course content divided into various forms of instruction Number of hours 4 Course content divided into various forms of instruction Number of hours 4 F/P-2 Analysis of plate bar system by matrix displacement method. 4 4 F/P-3 Static analysis of plate stress structure by ARSA system and finite-difference method. 4 4 F/P-4 Static analysis of pla				Zakła	d Teorii Konstru	kcii				\square	սլլւ	41.
Form of course credit credits Language english Electives Elective group Elective group Form of instruction Code Semester Hours ECTS Weight Credits aroject course P 2 15 1,0 0,50 credits ecture W 2 15 1,0 0,50 credits Leading teacher Silicka Ewa (Ewa.Silicka@zut.edu.pl) Prerequisites	ECTS					-	2.0		-			
Electives Elective group Form of instruction Code Semester Hours ECTS Weight Credits soriget course P 2 15 1,0 0,50 credits eacture W 2 15 1,0 0,50 credits leading teacher Silicka Ewa (Ewa.Silicka@zut.edu.pl) Descretation Silicka@zut.edu.pl) Descretation Deter teachers Silicka Ewa (Ewa.Silicka@zut.edu.pl) Descretation Number of hours Prerequisites Acquaintance with popular numerical methods according to static analysis of engineering structures. Number of hours C2 Ability to proper numerical definition and analysis of engineering structures by commercial systems. 1 Course content divided into various forms of instruction Number of hours F.P-1 Analysis of plate bar system by matrix displacement methods. 4 F.P-2 Analysis of plate bar system surture by ARSA system. Influence of mesh on results improvement. 2 F.P-3 Static analysis of plate system system by finite elements method. 4 F.P-4 Static analysis of plate system system sort instruction 4 F.P-5 Test.		ourse cr	edit		-s		-		-			
Form of instruction Code Semester Hours ECTS Weight Credit aroject course P 2 15 1,0 0,50 credits exture W 2 15 1,0 0,50 credits eading teacher Silicka Ewa (Ewa.Silicka@zut.edu.pl) Silicka Ewa (Ewa.Silicka@zut.edu.pl) Prerequisites Prerequ			cure	creat			cright		_			
P 2 15 1,0 0,50 credits ecture W 2 15 1,0 0,50 credits eading teacher Silicka Ewa (Ewa.Silicka@zut.edu.pl) Districta Ewa (Ewa.Silicka@zut.edu.pl) Districta Ewa (Ewa.Silicka@zut.edu.pl) Prerequisites Avi Passed course of mathematic. Module/course unit objectives C-1 Acquaintance with popular numerical methods according to static analysis of engineering structures. C-2 C-2 Ability to proper numerical definiton and analysis of engineering structures. C-2 C-2 Ability to proper numerical definiton and analysis of engineering structures. C-2 Course content divided into various forms of instruction Number of hours Cr-2 Analysis of plate bar system by matrix displacement methods. 4 Fr-3 Static analysis of plate bars structure by ARSA system. Influence of mesh on results improvement. 2 Fr-4 Static analysis of plate bars system by finite-difference method. 4 Fr-4 Static analysis of plate stress structure by finite elements method. 4 Fr-4 Static analysis of plate stress structure by finite elements within element method 9 Static analysis of plate bars, plates, shells and solids elements by finite element method 1 Fr-4 Static analysis of plate stress structure by			2	Cada	Comostor			ECTC		iaht	Crad	:+
V 2 15 1,0 0,50 credits Leading teacher Silicka Ewa (Ewa.Silicka@zut.edu.pl) Dther teachers Silicka Ewa (Ewa.Silicka@zut.edu.pl) Prerequisites Number of hours Molle/course unit objectives Number of hours Carse content divided into various forms of instruction Number of hours Number of hours F.P-1 Analysis of plate stress structure by ARSA system. Influence of mesh on results improvement. 2 2 3 F.P-3 Static analysis of plate stress structure by finite elements method. 4 <td></td> <td></td> <td>11</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td>-</td> <td></td> <td></td>			11						-	-		
Leading teacher Silicka Ewa (Ewa Silicka@zut.edu.pl) Other teachers Silicka Ewa (Ewa Silicka@zut.edu.pl) Prerequisites Art Art Passed course of mathematic. Module/course unit objectives Silicka Ewa (Ewa Silicka@zut.edu.pl) C-1 Acquaintance with popular numerical methods according to static analysis of engineering structures. C-2 Ability to proper numerical definiton and analysis of engineering structures by commercial systems. Course content divided into various forms of instruction Number of hours Course content divided into various forms of instruction Number of hours Course content divided into various forms of instruction Number of hours Course content divided into various forms of instruction Variation and single stress structure by ARSA system. Influence of mesh on results improvement. 2 T-P-2 Analysis of plate bras system by finite elements method. 4 F-P-3 Static analysis of plate stress structure by finite elements method. 4 F-P-4 Static analysis of plate stress structure by finite elements by finite element method 9 F-W-1 Revision of the matrix displacement method 11 F-W-2 Static linear analysis of plates by finite-difference method 11 F-W-2 Static analysis of plate by ARSA system and solids elements by finite element method 9		ourse										
Other teachers Silicka Ewa (Ewa.Silicka@zut.edu.pl) Prerequisites Silicka Ewa (Ewa.Silicka@zut.edu.pl) Prerequisites Module/course unit objectives C-1 Acquaintance with popular numerical methods according to static analysis of engineering structures. C-2 Ability to proper numerical definiton and analysis of engineering structures by commercial systems. Course content divided into various forms of instruction Number of hours F.P-1 Analysis of plate bar system by matrix displacement methods. 4 F.P-2 Analysis of plate bar system by matrix displacement methods. 4 F.P-3 Static analysis of plate stress structure by ARSA system. Influence of mesh on results improvement. 2 F.P-3 Static analysis of plate stress structure by finite elements method. 4 F.P-4 Static analysis of blate stress structure by finite elements method 5 F.P-4 Static linear analysis of bars, plates, shells and solids elements by finite element method 9 Static linear analysis of bars, plates, shells and solids elements by finite element method 9 Static linear analysis of bars, plates, shells and solids elements by finite element method 1 AP-3 Revision to test. 8 AP-3 Revision to tes								1,0	0	,50	credi	ts
Prerequisites M-1 Passed course of mathematic. Module/course unit objectives C-1 Acquaintance with popular numerical methods according to static analysis of engineering structures. C-2 Ability to proper numerical definiton and analysis of engineering structures by commercial systems. Course content divided into various forms of instruction Number of hours TrP-1 Analysis of plate bar system by matrix displacement methods. 4 FrP-2 Analysis of plate stress structure by ARSA system. Influence of mesh on results improvement. 2 TrP-3 Static analysis of plate stress structure by finite elements method. 4 TrP-4 Static analysis of plate stress structure by finite elements method. 2 TrP-4 Static analysis of plates by finite-difference method 5 TrW-1 Revision of them tartix displacement method 9 Static innear analysis of bars, plates, shells and solids elements by finite element method 9 Static innear analysis of bars, plates, shells and solids elements by finite element method 9 Static innear analysis of bars, plates, shells and solids elements by finite element method 9 Static innear analysis of bars, plates, shells and solids elements by finite element method 9 <td< td=""><td>Leading t</td><td>eacher</td><td></td><td>Silick</td><td>a Ewa (Ewa.Silic</td><td>ka@zut.edu.pl)</td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	Leading t	eacher		Silick	a Ewa (Ewa.Silic	ka@zut.edu.pl)						
W-1 Passed course of mathematic. Module/course unit objectives C-1 Acquaintance with popular numerical methods according to static analysis of engineering structures. C-2 Ability to proper numerical definiton and analysis of engineering structures by commercial systems. Course content divided into various forms of instruction Number of hours Course content divided into various forms of instruction Number of hours F.P-1 Analysis of plate bar system by matrix displacement methods. 4 T.P-2 Analysis of plate stress structure by ARSA system. Influence of mesh on results improvement. 2 T.P-3 Static analysis of plate stress structure by finite elements method. 4 T.P-4 Static analysis of plate stress structure by finite elements method. 4 T.P-5 Test. 2 T.W-1 Revision of the matrix displacement method 5 T.W-2 Static analysis of plates by finite-difference method. 9 Stude to workload - forms of activity Number of hours A4-P.1 Presents on laboratory tutorials. 15 A4-P.2 Prepering to laboratory tutorials. 8 A4-P.3 Revision to test. 8 A4-W-3 <td>Other tea</td> <td>chers</td> <td></td> <td>Silick</td> <td>a Ewa (Ewa.Silic</td> <td>ka@zut.edu.pl)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Other tea	chers		Silick	a Ewa (Ewa.Silic	ka@zut.edu.pl)						
Module/course unit objectives 5:1 Acquaintance with popular numerical methods according to static analysis of engineering structures. 5:2 Ability to proper numerical definiton and analysis of engineering structures by commercial systems. Course content divided into various forms of instruction Number of hours 7:P-1 Analysis of plate bar system by matrix displacement methods. 4 7:P-2 Analysis of plate stress structure by ARSA system. Influence of mesh on results improvement. 2 7:P-3 Static analysis of plate stress structure by finite elements method. Comparison of results. 3 7:P-4 Static analysis of plate stress structure by finite elements method. 4 7:P-5 Test. 2 7:W-1 Revision of the matrix displacement method 5 7:W-2 Static analysis of plates by finite-difference method 1 7:W-3 Static linear analysis of bars, plates, shells and solids elements by finite element method 9 Student workload - forms of activity Number of hours 11 7:W-2 Revision to test. 8 8 4:W-2 Prepering to laboratory tutorials. 15 4:W-3 Revision to test. 8 4:W-4	Prerequis	sites										
C-1 Acquaintance with popular numerical methods according to static analysis of engineering structures. C-2 Ability to proper numerical definiton and analysis of engineering structures by commercial systems. Course content divided into various forms of instruction Number of hours Course content divided into various forms of instruction Number of hours F.P-1 Analysis of plate bar system by matrix displacement methods. 4 F.P-2 Analysis of plate bar system by MRSA system. Influence of mesh on results improvement. 2 F.P-3 Static analysis of plate stress structure by ARSA system and finite-difference method. Comparison of results. 3 T.P-4 Static analysis of plate bar system by matrix displacement method 4 T.P-5 Test. 2 F.W-1 Revision of the matrix displacement method 5 T.W-2 Static analysis of plates by finite-difference method 9 Static inear analysis of bars, plates, shells and solids elements by finite element method 9 Static inear analysis of plate bar system 11 15 At-P.1 Presents on laboratory tutorials. 8 At-P.2 Prepering to laboratory tutorials. 8 At-P.3 Revision to test. 8	W-1	Passed	course of m	athem	atic.							
C-2 Ability to proper numerical definiton and analysis of engineering structures by commercial systems. Course content divided into various forms of instruction Number of hours T-P-1 Analysis of plate bar system by matrix displacement methods. 4 T-P-2 Analysis of plate bar system by MRSA system. Influence of mesh on results improvement. 2 T-P-3 Static analysis of plate stress structure by ARSA system and finite-difference method. Comparison of results. 3 T-P-4 Static analysis of plate stress structure by finite elements method. 4 T-P-5 Test. 2 T-W-1 Revision of the matrix displacement method 5 T-W-2 Static analysis of plates by finite-difference method 1 T-W-3 Static linear analysis of bars, plates, shells and solids elements by finite element method 9 Student workload - forms of activity Number of hours AP-1 Presents on laboratory tutorials. 15 AP-2 Prepering to laboratory tutorials. 8 AP-3 Revision to test. 8 AUW-1 Presence on lectures 8 AUW-2 Individual study 8 AUW-3 Resivon of presented problems	Module/c	ourse un	it objective	25								
Course content divided into various forms of instruction Number of hours Fr.P-1 Analysis of plate bar system by matrix displacement methods. 4 Fr.P-2 Analysis of plate stress structure by ARSA system. Influence of mesh on results improvement. 2 Fr.P-3 Static analysis of plate by ARSA system and finite-difference method. Comparison of results. 3 Fr.P-4 Static analysis of plate stress structure by finite elements method. 4 Fr.P-5 Test. 2 Fr.W-1 Revision of the matrix displacement method 5 Fr.W-2 Static analysis of plates by finite-difference method 1 Fr.W-3 Static linear analysis of bars, plates, shells and solids elements by finite element method 9 Student workload - forms of activity Number of hours 4 Ar-P-1 Presents on laboratory tutorials. 15 Ar-P-3 Revision to test. 8 AtW-1 Presence on lectures 15 AtW-2 Individual study 8 AtW-3 Resivon of presented problems 8 Teaching methods / tools 4 8 M-1 Lectures 15 V-2 I b	C-1	Acquair	ntance with	popula	r numerical metho	ods according to s	tatic analysis	s of engineeri	ng struct	tures.		
T-P-1 Analysis of plate bar system by matrix displacement methods. 4 T-P-2 Analysis of plate stress structure by ARSA system. Influence of mesh on results improvement. 2 T-P-3 Static analysis of plate by ARSA system and finite-difference method. Comparison of results. 3 T-P-4 Static analysis of plate stress structure by finite elements method. 4 T-P-4 Static analysis of plate stress structure by finite elements method. 4 T-P-4 Static analysis of plates by finite-difference method 2 T-W-1 Revision of the matrix displacement method 5 T-W-2 Static analysis of bars, plates, shells and solids elements by finite element method 9 Static linear analysis of bars, plates, shells and solids elements by finite element method 9 Static on laboratory tutorials. 15 A-P-1 Presents on laboratory tutorials. 15 A-P-2 Prepering to laboratory tutorials. 8 A-P-3 Revision to test. 8 A-W-1 Presence on lectures 15 A-W-3 Resivion of presented problems 8 Teaching methods / tools 8 Teaching methods / tools 5	C-2	Ability t	o proper nu	merica	l definiton and and	alysis of engineer	ing structure	s by commer	cial syste	ems.		
T-P-2 Analysis of plate stress structure by ARSA system. Influence of mesh on results improvement. 2 T-P-3 Static analysis of plate stress structure by ARSA system and finite-difference method. Comparison of results. 3 T-P-4 Static analysis of plate stress structure by finite elements method. 4 F-P-5 Test. 2 T-W-1 Revision of the matrix displacement method 5 T-W-2 Static analysis of plates by finite-difference method 1 T-W-3 Static inear analysis of bars, plates, shells and solids elements by finite element method 9 Student workload - forms of activity Number of hours AP-1 Presents on laboratory tutorials. 11 AP-2 Prepering to laboratory tutorials. 15 A-P-3 Revision to test. 8 A-W-1 Presence on lectures 15 A-W-2 Individual study 8 A-W-3 Resivion of presented problems 8 Teaching methods / tools 4 8 W-2 Laboratory tutorials 5 Evaluation methods (F - progressive, P - final) 5 1 S-1 F Mark of the final	Course co	ontent di	vided into	variou	is forms of instru	uction					Number of	f hours
T-P-3 Static analysis of plate by ARSA system and finite-difference method. Comparison of results. 3 T-P-4 Static analysis of plate stress structure by finite elements method. 4 T-P-5 Test. 2 T-W-1 Revision of the matrix displacement method 5 T-W-2 Static analysis of plates by finite-difference method 1 T-W-3 Static inear analysis of bars, plates, shells and solids elements by finite element method 9 Student workload - forms of activity Number of hours A-P-1 Presents on laboratory tutorials. 15 A-P-2 Prepening to laboratory tutorials. 8 A-P-3 Revision to test. 8 A-W-1 Presence on lectures 15 A-W-2 Individual study 8 A-W-3 Revision of presented problems 8 Teaching methods / tools 8 W-2 Laboratory tutorials 8 You Laboratory tutorials 8 Teaching methods / tools 5 15 W-1 Lectures 5 6 You Laboratory tutorials 8	T-P-1	-	•	-								4
T-P-4 Static analysis of plate stress structure by finite elements method. 4 T-P-5 Test. 2 T-W-1 Revision of the matrix displacement method 5 T-W-2 Static analysis of plates by finite-difference method 1 T-W-3 Static linear analysis of bars, plates, shells and solids elements by finite element method 9 Static linear analysis of bars, plates, shells and solids elements by finite element method 9 Static linear analysis of bars, plates, shells and solids elements by finite element method 9 Static linear analysis of bars, plates, shells and solids elements by finite element method 9 Static linear analysis of bars, plates, shells and solids elements by finite element method 9 Static linear analysis of bars, plates, shells and solids elements by finite element method 9 Static linear analysis of bars, plates, shells and solids elements by finite element method 9 Static linear analysis of bars, plates, shells and solids elements by finite element method 9 Static analysis of bars, plates, shells and solids elements by finite element method 9 Static analysis of bars, plates, shells and solids elements by finite-element method 15 A4-P-1 Presence on lectures 15 A-W-2 I	T-P-2											2
T-P-5 Test. 2 T-W-1 Revision of the matrix displacement method 5 T-W-2 Static analysis of plates by finite-difference method 1 T-W-3 Static linear analysis of bars, plates, shells and solids elements by finite element method 9 Static linear analysis of bars, plates, shells and solids elements by finite element method 9 Static linear analysis of bars, plates, shells and solids elements by finite element method 9 Static linear analysis of bars, plates, shells and solids elements by finite element method 9 Static linear analysis of bars, plates, shells and solids elements by finite element method 9 Static linear analysis of bars, plates, shells and solids elements by finite element method 9 Static linear analysis of bars, plates, shells and solids elements by finite element method 9 Static linear analysis of bars, plates, shells and solids elements by finite element method 9 Static linear analysis of bars, plates, shells and solids elements by finite element method 9 Static linear analysis of bars, plates, shells and solids elements by finite element methods 15 A-P-2 Prepering to laboratory tutorials. 8 A-W-3 Resivion of presented problems 8 Teaching methods / tools	Т-Р-З			-	-			parison of re	sults.			
T-W-1 Revision of the matrix displacement method 5 T-W-2 Static analysis of plates by finite-difference method 1 T-W-3 Static linear analysis of bars, plates, shells and solids elements by finite element method 9 Student w-rkload - forms of activity Number of hours A-P-1 Presents on laboratory tutorials. 15 A-P-2 Prepering to laboratory tutorials. 8 A-P-3 Revision to test. 8 A-W-1 Presence on lectures 15 A-W-2 Individual study 8 A-W-3 Resivion of presented problems 8 Teaching methods / tools 8 V-1 Lectures 8 V-2 Laboratory tutorials 8 Evaluation Ference to the final test 15 V-2 Laboratory tutorials 5 Evaluation Ference to the finitig outcomes of study 8 Presigned learning outcomes Reference to the fining outcomes of education of education of the finities of study 16 Course content Teaching for the finities of the finit			nalysis of pl	ate str	ess structure by fi	nite elements me	thod.					
T-W-2 Static analysis of plates by finite-difference method 1 T-W-3 Static linear analysis of bars, plates, shells and solids elements by finite element method 9 Student w-rkload - forms of activity Number of hours A-P-1 Presents on laboratory tutorials. 15 A-P-2 Prepering to laboratory tutorials. 8 A-P-3 Revision to test. 8 A-W-1 Presence on lectures 15 A-W-2 Individual study 8 A-W-3 Resivion of presented problems 8 Teaching methods / tools 8 V-1 Lectures 8 V-2 Laboratory tutorials 8 V-2 Laboratory tutorials 8 V-2 Laboratory tutorials 9 Studiution methods / tools 8 V-2 Laboratory tutorials 5 Studiution methods (F - progressive, P - final) 5 15 S-1 F Mark of the final test 1 Designed learning outcomes Reference to the learning outcomes study end to the end study array of end edgree of "nxyner" edgree of "nxyner" edgree of "nxyner" edgree of "nxyner" edgree of "nxyn	-		n of the mat	riv dia	lacoment method	4						
T-W-3 Static linear analysis of bars, plates, shells and solids elements by finite element method 9 Student workload - forms of activity Number of hours A-P-1 Presents on laboratory tutorials. 15 A-P-2 Prepering to laboratory tutorials. 8 A-P-3 Revision to test. 8 A-W-1 Presence on lectures 15 A-W-2 Individual study 8 A-W-3 Resivion of presented problems 8 Teaching methods / tools 8 W-2 Laboratory tutorials 8 V-2 Laboratory tutorials 2 Evaluation methods / tools 5 5 M-2 Laboratory tutorials 2 Evaluation methods (F - progressive, P - final) 5 5 S-1 F Mark of the final test 1 Designed learning outcomes Reference to the learning outcomes study Scurse on elective objective study 2 Reference to the learning outcomes study Study endersor of market of the fields of study Course content Teaching benchos study												_
Student workload - forms of activity Number of hours A-P-1 Presents on laboratory tutorials. 15 A-P-2 Prepering to laboratory tutorials. 8 A-P-3 Revision to test. 8 A-W-1 Presence on lectures 155 A-W-2 Individual study 8 A-W-3 Resivion of presented problems 8 Teaching methods / tools 8 M-2 Laboratory tutorials 8 Evaluation methods (F - progressive, P - final) 5 5-1 F Mark of the final test Reference to the learning outcomes study study in the digit of the			1				ts by finite el	ement metho	hd			
A.P-1 Presents on laboratory tutorials. 15 A.P-2 Prepering to laboratory tutorials. 8 A.P.3 Revision to test. 8 A-W-1 Presence on lectures 15 A-W-2 Individual study 8 A-W-3 Resivion of presented problems 8 A-W-3 Resivion of presented problems 8 Teaching methods / tools 8 W-1 Lectures 9 W-2 Laboratory tutorials 9 Evaluation methods (F - progressive, P - final) 5 S-1 F Mark of the final test Designed learning outcomes designed for the fielding to the eding											Number	
A-P-2 Prepering to laboratory tutorials. 8 A-P-3 Revision to test. 8 A-W-1 Presence on lectures 15 A-W-2 Individual study 8 A-W-3 Resivion of presented problems 8 A-W-3 Resivion of presented problems 8 Teaching methods / tools 8 M-1 Lectures 8 M-2 Laboratory tutorials 9 Evaluation methods (F - progressive, P - final) 5-1 F S-1 F Mark of the final test 1 Designed learning outcomes Reference to the designed for the fields of study Reference to the designed for the fields of study Course content Teaching wethods					-						Number of	
A-P-3 Revision to test. 8 A-W-1 Presence on lectures 15 A-W-2 Individual study 8 A-W-3 Resivion of presented problems 8 Teaching methods / tools 8 M-1 Lectures 8 M-2 Laboratory tutorials 9 Evaluation methods (F - progressive, P - final) 5-1 F S-1 F Mark of the final test 1 Designed learning outcomes Reference to the defined for the fields of study Reference to the defined for the fields of study Course content Teaching methods												_
A-W-1 Presence on lectures 15 A-W-2 Individual study 8 A-W-3 Resivion of presented problems 8 Teaching methods / tools 8 M-1 Lectures 9 M-2 Laboratory tutorials 9 Evaluation methods (F - progressive, P - final) 5 6 5-1 F Mark of the final test 1 Designed learning outcomes Reference to the study study study study study study study Reference to the study study study study study study Course content Teaching methods for the fields of education	A-P-3		•									
A-W-2 Individual study 8 A-W-3 Resivion of presented problems 8 Teaching methods / tools 8 M-1 Lectures 9 M-2 Laboratory tutorials 9 Evaluation methods (F - progressive, P - final) 5-1 F Mark of the final test S-1 F Mark of the final test 1 1 Designed learning outcomes Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of study Course content Teaching methods	A-W-1			es								-
Teaching methods / tools M-1 Lectures M-2 Laboratory tutorials Evaluation methods (F - progressive, P - final) 5-1 F Mark of the final test Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes Course content Teaching rethods Period Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes defined for the graticular areas of education Course content Teaching methods	A-W-2	Individu	ial study									
M-1 Lectures M-2 Laboratory tutorials Evaluation methods (F - progressive, P - final) S-1 F Mark of the final test Designed learning outcomes Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Course content Teaching methods Evaluation methods	A-W-3	Resivior	n of present	ed prol	blems							8
M-1 Lectures M-2 Laboratory tutorials Evaluation methods (F - progressive, P - final) S-1 F Mark of the final test Designed learning outcomes Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Course content Teaching methods Evaluation methods	Teaching	methods	s / tools							I		
Evaluation methods (F - progressive, P - final) 5-1 F Mark of the final test Designed learning outcomes Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Course content Teaching methods Evaluation methods	M-1	-										
5-1 F Mark of the final test Designed learning outcomes Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the learn	М-2	Laborat	ory tutorials	5								
5-1 F Mark of the final test Designed learning outcomes Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the fields of education Reference to the learning outcomes designed for the learn	Evaluatio	n metho	ds (F - prod	gressiv	/e, P - final)							
Designed learning outcomes designed for the fields of study	S-1			-								
Knowledge			ed learning	g outco	omes	learning outcomes designed for the fields of	learning outcomes defined for the particular areas of	learning outcomes leading to the		Course con		
	Knowledg	<i>je</i>										

B-A_2A_A/C/07_W01 Knows and understands algorithms of popular numerical methods in accordance to linear static analysis of engineering structures.	B-A_2A_W04	P7S_WG_TA21	P7S_WG_IA21	C-1 C-2	T-W-1 T-W-2	T-W-3	M-1	S-1
Skills								
B-A_2A_A/C/07_U01 Is able to define and analize simple structures with the use of commercial systems.	B-A_2A_U17	P7S_UW_TA24		C-1 C-2	T-P-1 T-P-2 T-P-3	T-P-4 T-P-5	M-2	S-1
Other social / personal competences								
B-A_2A_A/C/07_K01 Understands responsibility for the profesionally made calculations.	B-A_2A_K02	P7S_KK		C-1 C-2	T-P-1 T-P-2	T-P-3 T-P-4	M-2	S-1
Required reading								
1. Cook R. D., Malkus D. S., Plesha M. E., Witt R. J., Conce	epts and Applica	tions of Finite	Element Analy	/sis, Wi	ley, 20	02		
2. Desei C. S., Abel J. F., Introduction to the Finite Elemer	nt Method, VNR,	New York						
3. Zienkiewicz O. C., The Finite Element Method in Engine	eering Science,	McGraw-Hill, L	ondon					

Field of stu	Jdy	Civil	Engineering								
Mode of st	tudy	statio	onary	Level	second	cycle					
Graduate's	s qualification	magi	ster	•			V	VBi/	4		
Area(s) of	study	nauk	i techniczne						<u>`</u>		_
Education	al profile	gene	ral academic					- 11			
Module								- 11		Гп	
Course un	it	Basi	cs of Scientific	Information	- Training			- 11			
Code		WBiA	/S2CE/W01					- 11			
Field of sp	ecialisation										
Administe	ring faculty	Kateo	dra Geotechniki					N	<u> </u>		
ECTS		0,0		ECTS (forms)	0,0						
Form of co	ourse credit	credi	ts	Language	english						
Electives				Elective group	0						
Form of in	struction	Code	Semester	Hours		ECTS	We	eight		Credit	t
lecture		w	3	2		0,0	1	,00		credit	S
Leading te	acher	SSB F	Prodziekan (Prod	ziekan.SSB@zı	ut.edu.pl)				1		
Other tead			ng Professor (Vis								
Prerequisi	tes		<u> </u>		• ·						
W-1	basics of computer	use ar	nd internet								
Module/co	urse unit objective	25									
C-1	Student knows the		ources of search t	he books and otl	ner sources of	needed infor	mation.				
Course co	ntent divided into	varioi	is forms of instri	uction					Numl	her of	hours
	Library system at Z	UT, so	urces scientific info	ormation, Knove							
T-W-1	books exchange be bases	tween	libraries, bibligrap	hy, practical adv	ises for searc	h the informa	tion in c	data			2
Student w	orkload - forms of	activi	ty						Numl	ber of	hours
Teaching I	methods / tools										
M-1	Lecture										
Evaluation	methods (F - prog	gressi	ve, P - final)								
S-1	F presence or	n lectu	re								
	Designed learning	g outc	omes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course co		Teaching methods	Evaluation methods
Knowledge	9			•		•					
catalogues to	V01_W01 is bases and informatio search for materials fo c rules in research and	or diplor	na thesis. Is aware	B-A_2A_W15	P7S_WK_TA21	P75_WK_IA21	C-1	T-W-1		M-1	S-1
Skills											
	le to choose relevant el ervices, library catalogi			B-A_2A_U01	P7S_UK		C-1	T-W-1		M-1	S-1
Other soci	al / personal comp	petenc	ces			•					
B-A_2A_B-A/W Student is ab bases, unders	V01_K01 le to use information er stands ethic aspects an	nvironm d copyr	ent of scientific data ight law.	B-A_2A_K06 B-A_2A_K07	P7S_KR		C-1	T-W-1		M-1	S-1
Required r	-										
World, The	de Weck, Daniel Ro MIT Press Cambridg	je, Mas	sachusetts, Londo	n, England, 2011	[-	chnolo	gical
	n, S. Sharma, Techn	ical Co	ommunication Prin	ciples and Practi	ce, Oxfor Univ	versity Press, (Oxford,	2015, 3r	d		
	ntary reading										
1. Kenneth	G. Budinski, Prepariı	ng and	Delivering Techni	cal Presentation	s, ASTM Interr	national, 2006	5				

			J	<u> </u>	<u> </u>						
Field of s	study	Civil E	Engineering								
Mode of	study	statio	onary	Level	second	cycle					
Graduate	e's qualification	magis	ster				V	VBi/	4		
Area(s) c	of study	nauki	i techniczne						<u>`</u>		_
Educatio	nal profile	genei	ral academic						∣∟	_	
Module									1 🖬	1Г в	п.
Course u	ınit	Pract	tical Placemen	t - 4 weeks						E	!
Code		WBiA	/S2CE/P/01							ШП	
Field of s	specialisation										
Administ	tering faculty	Dziek	anat						쁘		
ECTS		1,0		ECTS (forms)	1,0						
Form of a	course credit	credit	ts	Language	polish						
Electives	5			Elective group	0		_				
Form of i	instruction	Code	Semester	Weeks		ECTS	We	eight		Credi	t
		PR	2	4		1,0		,00		credit	 S
Leading	teacher		- Prodziekan (Prod			, -		'			
Other tea			Prodziekan (Prod	-							
					uuu.pi)						
Prerequi: W-1	Actual insurance a	nd curr	ont modical oxami	nations with an	ontry about th	o possibility (ofworki	ag at boi	abte		
								ig at nei	gnts		
Module/c C-1	Practical observat		participation of th	o implomentatio	n of individual	stages of the	invoctr	nont pro	coss in	constr	uction
			· ·	•		stages of the	investi	nent pro			
Course c	ontent divided into				n company re	levant offices	lahora	tories -	Num	ber of	weeks
T-PR-1	completed with th staff safety.	e develo	opment of a report	on internships.	Industrial safe	ety measures,	individu	ual and			4
Student	workload - forms o	f activit	ty						Num	ber of	hours
A-PR-1	Practical placeme			asures training.							10
A-PR-2	Preparing report o										10
A-PR-3	Completion on pra			pared report							4
A-PR-4	Preparation to pas	s the m	odule								7
	g methods / tools										
M-1	practical method										
	on methods (F - pro										
S-1	P report and	discuss	ion	1	1						
	Designed learnir	ig outc	omes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course c	ontent	Teaching methods	Evaluatio methods
Knowled	ge			1	1	I	1	1			1
B-A_2A_S2E Student kno principles o investment	B-A/P/01_W01 ows the standards applic of building management, process - its organization of conducting business of	has knov n, partici	wledge about the ipants and knows	B-A_2A_W11 B-A_2A_W14	P75_WG_TA21 P75_WK_TA21	P75_WG_IA21 P75_WK_IA21	C-1	T-PR-1		M-1	S-1
Skills					1						<u>.</u>
	B-A/P/01_U01	archite	tural drawing-					T-PR-1			
construction	quires the ability to read n and maps. He can pre conment of selected CAD	pare grap program	phic documentation nmes and can	B-A_2A_U16 B-A_2A_U23	P7S_UW_TA23 P7S_UW_TA24		C-1			M-1	S-1
organize wo	ork on a construction sit of construction technolog										

B-A_2A_S2B-A/P/01_K01 Student understands the need to learn throughout life - based on the observation of the construction work, the design office. He is responsible for his own and team's security. He is aware of the responsibility for his own work and readiness to comply with the principles of teamwork and taking responsibility for the tasks he or she has carried out jointly. Is aware of the importance of behavior in a professional manner and compliance with the rules of professional ethics	B-A_2A_K06	P7S_KR	C-1	T-PR-1	M-1	S-1
Required reading						
1. Documentation of building site						

						_	
Field of st	tudy	Civil E	Engineering				
Mode of s	tudy	statio	nary	Level	second cycle		
Graduate	's qualification	magis	ster	1		WBi/	Δ
Area(s) of	f study	nauki	techniczne			V	`
Education		gener	ral academic				
Module	,					-	
Course ur	nit	Theo	ry of Construc	tions		-	
Code		-	/S2CE/ES/D/01-1			-	
	pecialisation		eering Structure			- \	
		-				$ \setminus$ $ $	
	ering faculty		d Teorii Konstru	-	2.0		
ECTS		3,0		ECTS (forms)	3,0		
	ourse credit	credit	ts	Language	english		
Electives				Elective group			T
Form of ir	nstruction	Code	Semester	Hours	ECTS	Weight	Credit
laboratory	y course	L	1	15	1,0	0,34	credits
project co	ourse	Р	1	15	1,0	0,33	credits
lecture		W	1	15	1,0	0,33	credits
Leading t	eacher	Webe	er Hanna (Hanna	.Weber@zut.edu.	nl)		
Other tea							
Prerequis							
W-1 W-2	Mathematics Physics						
W-2 W-3	Structural Mechani	ice					
W-3 W-4	Numerical Methods						
	ourse unit objectiv						
C-1	-		Statics and limit s	tates of continuous k			
C-1 C-2	-			nent envelope in con			
C-3	Ability to consider						
C-4	Ability to consider		5				
C-5	Ability to solve the						
Course co	ontent divided into	variou	is forms of instr	uction			Number of hours
T-L-1	Plane state of stres						3
T-L-2	Torsion of thin-wal	led cros	s-section				3
T-L-3	Observation and vi	isualiza	tion of vibrations				3
T-L-4	Elastic buckling of	bar					2
T-L-5	Influence lines of c	ontinuo	ous beam.				2
T-L-6	Stretching of non-s	symmet	rical thin-walled c	ross-section			2
T-P-1	Influence lines of c	ontinuo	ous beams.				5
Т-Р-2	Beams on flexible	-					5
Т-Р-З	Limit states of bea						5
T-W-1	Static indeterminat	te conti	nuous beams, infl	uence lines.			3
T-W-2	Cables and chains						2
T-W-3	Beams on flexible		£				4
T-W-4	Limit states of bea						6
	vorkload - forms of		-				Number of hours
A-L-1	Attending the labo	-					15
A-L-2	Preparation for lab	-					15
A-P-1	Attending the proje						15
A-P-2	Preparation for pro	oject cla	sses				5

Student	workloa	d - forms of activity						Num	nber of	hours
A-P-3	Execu	tion of project assignment								10
A-W-1	Attend	ling the lectures.								15
A-W-2	Study	ing/revision for the final exam.								13
A-W-3	Partici	pation in the exam.								2
Teaching	g metho	ds / tools								
M-1	Lectur	e								
M-2	Projec	t class								
M-3	Labora	atory class								
Evaluatio	on meth	ods (F - progressive, P - final)								
S-1	Р	Written exam								
S-2	F	Assesment of project assignment								
S-3	F	Assesment during the laboratory cla	isses							
	Desig	ned learning outcomes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Cours	e content	Teaching methods	Evaluation methods
Knowled	lge		1	l					1	1
B-A_2A_A/C Student kno indetermina	ows how to	o create numerical models for static stems with permanent and live loads.	B-A_2A_W05	P7S_WG_TA21	P7S_WG_IA21	C-1	T-W-1 T-W-2	T-W-3 T-W-4	M-1	S-1
Skills										
	able to cre	ate numerical and measuring models in addressed problem	B-A_2A_U19	P75_UW_TA24		C-2 C-3 C-4 C-5	T-L-1 T-L-2 T-L-3 T-L-4 T-L-5 T-L-6 T-P-1	T-P-2 T-P-3 T-W-1 T-W-2 T-W-3 T-W-4	M-1 M-2 M-3	S-1 S-2 S-3
Other so	cial / pe	rsonal competences								
B-A_2A_A/C Student is a	C/01_K01 aware of re	esponsibility for his computation	B-A_2A_K02	P7S_KK		C-2 C-3 C-4 C-5	T-P-1 T-P-2 T-P-3 T-W-1	T-W-2 T-W-3 T-W-4	M-1 M-2	S-1 S-2
Required	d reading	g								
1. Kennet	h M. Leet	, Chia-Ming Uang, Anne M. Gilbert, Fu	indamentals of S	tructural Anal	ysis, McGraw-	Hill, 201	11, Fou	rth editi	on	
2. Jacques	s Heymar	n, Elements of the theory of Structure	s, Cambridge Un	iversity Press,	1996					

Field of	study		Civil E	Engineering							
Mode of	f study		statio	nary	Level	second	cycle				
Graduat	te's quali	fication	magis	ster		4		M	/BiA		
Area(s)	of study		nauki	techniczne							_
Educatio	onal profi	le	gener	ral academic							
Module									- 11 i		П.
Course a	unit		Com	puter Aided De	esign-2						<u>.</u>
Code			WBIA,	/S2CE/ES/D/08-2	2						
Field of	specialis	ation	Engin	eering Structure	es						
Adminis	tering fa	culty	Kated	lra Konstrukcji Ż	zelbetowych i Te	chnologii B	etonu		J Ľ	ᆈᄔ	<u> </u>
ECTS			2,0		ECTS (forms)	2,0					
Form of	course c	redit	credit	S	Language	english		-			
Elective	S				Elective group			-			
Form of	instructi	on	Code	Semester	Hours		ECTS	We	ight	Credi	t
project o	course		Р	2	30		1,0	0,	50	credit	S
lecture			w	2	15		1,0	0,	50	credit	S
Leading	teacher		Brzoz	owski Piotr (Piot	⊥ tr.Brzozowski@z	ut.edu.pl)					
Other te					ominik.Kacprzał	•	ol). Visitina F	Professo	r (Visitina	@zut.edu	(la.
Prerequ				·		<u> </u>	- ,, - J		· · · J	<u> </u>	
W-1		ating maior o	f anv s	pecialty in Civil Er	ngineering as full-	time or extra	mural studies	;			
Modula		nit objective			5 5						
C-1		-		d concrete structu	Ires using comput	er programs					
C-2	-				tion of reinforced		ctures using	compute	r programs		
Course o	content c	livided into	variou	s forms of instru	uction				N	umber of	hours
T-P-1	Desigr prepar	of various re ation, load co	einforce ollectio	e concrete elemer	nts using compute Itimate limit state						30
T-W-1	Introd				ods used in calcul	ations of reir	forced concre	ete elemr	nets		2
T-W-2		uction to the eir document		ot of preparation o	of engineering dra	wings of rein	forced concre	te eleme	nts		2
T-W-3					crete elements an						4
T-W-4					ete elements and						2
T-W-5	Ultima	te limit state	and se	erviceability limit	states in compute	r calculations	5				5
	1	d - forms of		ty					N	umber of	hours
A-P-1		pation in clas									30
A-W-1		pation in lect									15
A-W-2		e preparation		ature study							13
A-W-3	_	an final test									2
	g method										
М-1 М-2	Lectur Projec	-									
	-										
		ods (F - prog									
S-1	Р Р	-		lled assignment ssigned to do at h	ome						
5-2			WUIK d					<u> </u>			
S-2						Defense a testing	1	1		1	1
5-2	Desig	ned learning	g outco	omes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course conter	t Teaching methods	Evaluation methods

CE_2A_CE/C/08-2_W01 Understands the aim of using computer programs in design and	B-A_2A_W02 B-A_2A_W04	P7S WG TA21	P7S WG IA21	C-1	T-P-1 T-W-1	T-W-3 T-W-4	M-1	S-1
preparations of drawings and documentation of reinforced concrete elements and structures	B-A_2A_W06 B-A_2A_W09			C-2	T-W-2	T-W-5	M-2	S-2
Skills								
CE_2A_CE/C/08-2_U01 Can prepare calculations and documentation of elements and structures using computer programs	B-A_2A_U08 B-A_2A_U09 B-A_2A_U14 B-A_2A_U18 B-A_2A_U20	P7S_UW_TA21 P7S_UW_TA24		C-1 C-2	T-P-1 T-W-1 T-W-2	T-W-3 T-W-4 T-W-5	M-1 M-2	S-1 S-2
Other social / personal competences								
CE_2A_CE/C/08-2_K01 Has awareness of the need for individual studying and upgrading professional skills	B-A_2A_K06	P7S_KR		C-1 C-2	T-P-1 T-W-1 T-W-2	T-W-3 T-W-4 T-W-5	M-1 M-2	S-1 S-2
Required reading								
1. Kuang-Hua Chang, Design Theory and Methods using (CAD/CAE, Elsevi	ier, 2014						
2. Rao, Singiresu S., The finite element method in engine	ering, Elsevier,	2011						
3. various, Programs manuals and tutorials, various								
Supplementary reading								
1. Ning Gu, Xiangyu Wang, Computational Design Method 2012	ds and Technolo	ogies: Applicat	ions in CAD, C	AM and	d CAE E	ducatior	i, IGI Glo	obal,

Field of s Mode of	atu du i						7				
Mode of	study	Civil E	Engineering								
	study	statio	nary	Level	second	cycle	1				
Graduate	e's qualificat	<i>ion</i> magis	ster		I		V	VBi/	Δ		
Area(s) c	of study	nauki	techniczne				V	יוטי	`		
Educatio	nal profile	gener	ral academic				1 F		ПΕ		
Module	,							II			
Course u	ınit	Cost	Management	in Constructio	n-1			I I		旧니	
Code			/S2CE/ES/D/09-					I I		Шп	
	specialisatior		eering Structu				1	I I			
		Zosná	-	Ekonomiki, Orga	nizacii i Za	rzadzania w			10		
Administ	tering faculty		wnictwie	Ekonomiki, orge							
ECTS		2,0		ECTS (forms)	2,0						
Form of a	course credi	t credit	S	Language	english		1				
Electives	5			Elective group			1				
Form of i	instruction	Code	Semester	Hours		ECTS	We	eight		Credit	-
project c	ourse	Р	2	15		1,0	0	,50		credite	5
lecture		w	2	15		1,0	0	,50		credite	5
Leading	teacher	Boche		a (Magdalena.Bo	 chenek@zi		1		<u> </u>		
Other tea		Boene	enek Magaalen		CHCHCK@20						
Prerequis W-1		ladaa of constr	uction tochnolog	v and construction	matariala						
		-		y and construction	materials						
	course unit o	-									
C-1				t will be able to ma	nage the cor	nstruction cost	effect	ively and	1	-	
Course c	content divid	ed into variou	s forms of insti		nage the cor	nstruction cost	effect	ively and	1	ntably ber of	
Course c T-P-1	content divid	<i>ed into variou</i> gement using s	<i>is forms of insti</i> oftware	ruction	nage the cor	nstruction cost	effect	ively and	1	-	15
Course c T-P-1 T-W-1	Cost mana Introductio	ed into variou gement using so n to internation	of forms of insti oftware al cost managen	ruction	nage the cor	nstruction cost	effect	ively and	1	-	15 1
Course c T-P-1 T-W-1 T-W-2	Cost mana Cost mana Introductio	ed into variou gement using s n to internation al best practice	is forms of instr oftware al cost managen es	ruction nent	nage the cor	nstruction cost	effect	ively and	1	-	15 1 2
Course c T-P-1 T-W-1 T-W-2 T-W-3	Cost mana Cost mana Introductio Internation Simulation	ed into variou gement using s n to internation al best practice techniques for	es forms of instr oftware al cost managen es cost managemen	ruction nent	nage the cor	nstruction cost	effect	ively and	1	-	15 1 2 3
Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4	Cost mana Cost mana Introductio Internation Simulation Managing r	ed into variou gement using s n to internation al best practice techniques for risks within the	es forms of instr oftware al cost managen es cost managemen	ruction nent	nage the cor	nstruction cost	effect	ively and	1	-	15 1 2 3 3
Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5	Cost mana Cost mana Introductio Internation Simulation Managing r Value man	ed into variou gement using s n to internation al best practice techniques for risks within the agement	es forms of instr oftware al cost managen es cost managemen project cost	ruction nent	nage the cor	nstruction cost	effect	ively and	1	-	15 1 2 3 3 3 3
Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6	Cost manage Cost manage Introductio Internation Simulation Managing r Value manage Cost contro	ed into variou gement using s n to internation al best practice techniques for risks within the agement ol and monitorin	es forms of insti oftware aal cost managen es cost managemen project cost	ruction nent	nage the cor	nstruction cost	effect	ively and	Numl	ber of	15 1 2 3 3 3 3 3 3
Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 Student	Cost mana Cost mana Introductio Internation Simulation Managing r Value man Cost contro	ed into variou gement using so n to internation al best practice techniques for risks within the agement ol and monitorin	es forms of insti oftware aal cost managen es cost managemen project cost	ruction nent	nage the cor	nstruction cost	effect	ively and	Numl	-	15 1 2 3 3 3 3 4 hours
Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 Student (A-P-1	Cost manage Introductio Internation Simulation Managing r Value mana Cost contro workload - fo Class Partic	ed into variou gement using s n to internation al best practice techniques for risks within the agement of and monitorin prms of activit cipation	es forms of insti oftware aal cost managen es cost managemen project cost	ruction nent	nage the cor	nstruction cost	effect	ively and	Numl	ber of	15 1 2 3 3 3 3 3 hours 15
Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 Student A-P-1 A-P-2	Cost mana Cost mana Introductio Internation Simulation Managing r Value man Cost contro workload - fo Class Partio Exercise pr	ed into variou gement using s n to internation al best practice techniques for risks within the agement of and monitorin orms of activit cipation reparation	es forms of insti oftware aal cost managen es cost managemen project cost	ruction nent	nage the cor		effect	ively and	Numl	ber of	15 1 2 3 3 3 3 4 hours
Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 Student (A-P-1	Cost mana Cost mana Introductio Internation Simulation Managing r Value man Cost contro Workload - fo Class Partio Exercise pr Class Partio	ed into variou gement using so n to internation al best practice techniques for risks within the agement of and monitorin corms of activit cipation cipation	es forms of instr oftware al cost managen es cost managemen project cost ng procedures	ruction nent		nstruction cost	effect	ively and	Numl	ber of	15 1 2 3 3 3 3 hours 15 15
Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 Student A-P-1 A-P-2 A-W-1	Cost mana Cost mana Introductio Internation Simulation Managing r Value man Cost contro Workload - fo Class Partio Exercise pr Class Partio Independe	ed into variou gement using so n to internation al best practice techniques for risks within the agement of and monitorin corms of activit cipation cipation	es forms of instr oftware al cost managen es cost managemen project cost ng procedures	nent			effect	ively and	Numl	ber of	15 1 2 3 3 3 3 4 0 0 0 5 15 15 15
Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 Student A-P-1 A-P-2 A-W-1 A-W-2	Cost mana Cost mana Introductio Internation Simulation Managing r Value man Cost contro Workload - fo Class Partio Exercise pr Class Partio Independe	ed into variou gement using s n to internation al best practice techniques for risks within the agement of and monitorin orms of activit cipation reparation cipation nt analysis of le n for the exam	es forms of instr oftware al cost managen es cost managemen project cost ng procedures	nent			effect	ively and	Numl	ber of	15 1 2 3 3 3 3 3 3 4 <i>hours</i> 15 15 15 15 7
Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 Student A-P-1 A-P-2 A-W-1 A-W-2 A-W-3 A-W-4	Cost mana Introductio Internation Simulation Managing r Value man Cost contro Workload - fo Class Partio Exercise pr Class Partio Independen Preparatior Final exam	ed into variou gement using s n to internation al best practice techniques for risks within the agement of and monitorin orms of activit cipation reparation cipation nt analysis of le n for the exam	es forms of instr oftware al cost managen es cost managemen project cost ng procedures	nent			effect	ively and	Numl	ber of	15 1 2 3 3 3 3 4 0 0 15 15 15 15 7 7 7
Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 Student A-P-1 A-P-2 A-W-1 A-W-2 A-W-3 A-W-4	Cost mana Introductio Internation Simulation Managing r Value man Cost contro Workload - fo Class Partio Exercise pr Class Partio Independen	ed into variou gement using s n to internation al best practice techniques for risks within the agement of and monitorin orms of activit cipation reparation cipation nt analysis of le n for the exam	es forms of instr oftware al cost managen es cost managemen project cost ng procedures	nent			effect	ively and	Numl	ber of	15 1 2 3 3 3 3 4 0 0 15 15 15 15 7 7 7
Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 Student 1 A-P-1 A-P-2 A-W-1 A-W-2 A-W-1 A-W-2 A-W-3 A-W-4 Teaching M-1	Cost mana Cost mana Introductio Internation Simulation Managing r Value man Cost contro Workload - fo Class Partio Exercise pr Class Partio Independer Preparatior Final exam	ed into variou gement using s n to internation al best practice techniques for risks within the agement of and monitorin orms of activit cipation reparation cipation nt analysis of le n for the exam tools ise studies	es forms of insti oftware aal cost managemen ss cost managemen project cost ng procedures ty	nent			effect	ively and	Numl	ber of	15 1 2 3 3 3 3 4 0 0 15 15 15 15 7 7 7
Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 Student 1 A-P-1 A-P-2 A-W-1 A-W-2 A-W-3 A-W-4 Teaching M-1 Evaluatic	Cost manage Introductio Internation Simulation Managing r Value mana Cost contro Workload - fo Class Partio Exercise pr Class Partio Independen Preparation Final exam methods / to Lecture, ca	ed into variou gement using so n to internation al best practice techniques for risks within the agement of and monitorin orms of activit cipation nt analysis of le n for the exam tools ise studies (F - progressiv	ecture content an <i>re, P - final</i>)	nent			effect	ively and	Numl	ber of	15 1 2 3 3 3 3 4 0 0 15 15 15 15 7 7 7
Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 Student A-P-1 A-P-2 A-W-1 A-W-2 A-W-1 A-W-2 A-W-3 A-W-4 Teaching M-1	Cost manadi Cost manadi Introductio Internation Simulation Managing r Value mana Cost contro Workload - fo Class Partio Exercise pr Class Partio Independer Preparatior Final exam g methods / to Lecture, ca	ed into variou gement using s n to internation al best practice techniques for risks within the agement of and monitorin orms of activit cipation reparation cipation nt analysis of le n for the exam tools ise studies	ecture content an <i>re, P - final</i>)	nent			effect	ively and	Numl	ber of	15 1 2 3 3 3 3 4 0 0 15 15 15 15 7 7 7
Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 Student v A-P-1 A-P-2 A-W-1 A-W-2 A-W-1 A-W-2 A-W-3 A-W-4 Teaching M-1 Evaluatic S-1	Cost manage Introductio Internation Simulation Managing r Value mana Cost contro Workload - fo Class Partio Exercise pr Class Partio Independen Preparatior Final exam g methods / to Lecture, ca on methods (P writ	ed into variou gement using s n to internation al best practice techniques for risks within the agement of and monitorin orms of activit cipation nt analysis of le n for the exam tools ise studies (F - progressiv tinuous assessr	es forms of instr oftware al cost managemen project cost ng procedures ty ecture content an <i>(e, P - final)</i> ment	nent		Reference to learning outcome learning outcome degree of "inżynier"	Course	Course c	Numi Numi	ber of	15 1 2 3 3 3 3 4 0 0 15 15 15 15 7 7 7
Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 Student v A-P-1 A-P-2 A-W-1 A-P-2 A-W-1 A-W-2 A-W-3 A-W-4 Teaching M-1 Evaluatic S-1	Cost manadi Cost manadi Introductio Internation Simulation Managing r Value mana Cost contro Workload - fo Class Partio Exercise pr Class Partio Exercise pr Class Partio Independer Preparation Final exam methods / fo Lecture, ca on methods of P writ Designed	ed into variou gement using s n to internation al best practice techniques for risks within the agement of and monitorin orms of activit cipation nt analysis of le n for the exam tools ise studies (F - progressiv tinuous assessr	es forms of instr oftware al cost managemen project cost ng procedures ty ecture content an <i>(e, P - final)</i> ment	ruction nent nt	ition Reference to the learning outcomes defined for the particular areas of	Reference to learning outcomes leading to the	Course		Numi Numi	ber of ber of	15 1 2 3 3 3 3 3 3 15 15 15 15 7 7 7 1 1 5

Skills							
CE_2A_A/C/06_U01 Student is able to: analyse and control the cost for various cases.	B-A_2A_U24	P7S_UW_TA22	C-1	T-P-1 T-W-1 T-W-2 T-W-3	T-W-4 T-W-5 T-W-6	M-1	S-1 S-2
Other social / personal competences							
CE_2A_A/C/06_K01 Student is able in both professional and responsible way use gained knowledge and skills in executions works associated with cost management.	B-A_2A_K05	P75_KO	C-1	T-P-1 T-W-1 T-W-2 T-W-3	T-W-4 T-W-5 T-W-6	M-1	S-1 S-2
Required reading							
1. K. Potts, N.Ankrah, Construction cost management, Ro	utledge, 2017						

Field of s						7		
	study	Civil E	Engineering					
Mode of	study	statio	nary	Level	second cycle			
Graduat	e's qualificat	tion magis	ster	•		WBi/	Д	
Area(s)	of study	nauki	techniczne				<u>`</u>	_
Educatic	onal profile	gener	al academic					
Module								
Course ι	unit	Mana	agement of bu	ilding projects				1
Code		WBIA	/S2CE/ES/D/02				[11
Field of :	specialisatio	n Engin	eering Structur	es				
Adminis	tering faculty		ół Dydaktyczny wnictwie	Ekonomiki, Orgar	iizacji i Zarządzania w			
ECTS		2,0		ECTS (forms)	2,0			
Form of	course credi	it credit	S	Language	english			
Electives	s			Elective group				
Form of	instruction	Code	Semester	Hours	ECTS	Weight	Credi	t
project o	course	Р	1	15	1,0	0,50	credit	S
lecture		w	1	15	1,0	0,50	credit	S
Leading	teacher	Boche	enek Magdalena	 (Magdalena Boc	henek@zut.edu.pl)			
Other te		boene			nenek@2ut.cuu.pl/			
Prerequi W-1	1	ledge of constr	uction technology	y and construction r	natorials			
Modula	courco unit c							
		bjectives	ourse the student	will be able to rece	anizo project manageme	nt procedures a	long with tool	c used
	Upon comp	oletion of this co	ourse the student , monitor, and co		gnize project manageme	nt procedures a	long with tool	s used
C-1	Upon comp to plan, ma	oletion of this co anage, organize		ntrol a project	gnize project manageme	nt procedures a	long with tool	
C-1 Course c	Upon comp to plan, ma content divid	oletion of this co anage, organize led into variou	, monitor, and co s forms of instr	ntrol a project		nt procedures a	-	
C-1	Upon comp to plan, ma content divid Case study	oletion of this co anage, organize led into variou v: management	, monitor, and co s forms of instr of building projec	ntrol a project <i>uction</i> It based on selected			-	hours
C-1 Course c T-P-1	Upon comp to plan, ma content divid Case study Introductio Project ma	letion of this co anage, organize led into variou v: management on and course re nagement meth	, monitor, and co s forms of instr of building projec equirements. Safe nodology: PRINCE	ntrol a project uction It based on selected Ity measures on bui 2, Waterfall, and Ag	l examples Iding site, individual and ile		-	<i>hours</i> 15 1 5
C-1 Course c T-P-1 T-W-1 T-W-2 T-W-3	Upon comp to plan, ma content divid Case study Introductio Project ma Project pha	led into variou canage, organize led into variou canagement m and course re nagement methases: strategy p	, monitor, and co s forms of instr of building projec equirements. Safe nodology: PRINCE hase, planning ph	ntrol a project uction t based on selectec ty measures on bui	l examples Iding site, individual and ile		-	<i>hours</i> 15 1 5 2
C-1 Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4	Upon comp to plan, ma Content divid Case study Introductio Project ma Project pha Mind Mapp	led into variou ': management on and course re nagement methases: strategy p bing for Project N	, monitor, and co es forms of instr of building projec equirements. Safe nodology: PRINCE hase, planning ph Management	ntrol a project uction It based on selected Ity measures on bui 2, Waterfall, and Ag	l examples Iding site, individual and ile		-	<i>hours</i> 15 1 5 2 2
C-1 Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5	Upon comp to plan, ma Case study Introductio Project ma Project pha Mind Mapp CPM and C	letion of this co anage, organize led into variou r: management on and course re nagement meth ases: strategy p bing for Project N CPM methodolo	, monitor, and co es forms of instr of building project equirements. Safe nodology: PRINCE hase, planning ph Management 199	ntrol a project uction It based on selected Ity measures on bui 2, Waterfall, and Ag	l examples Iding site, individual and ile		-	<i>hours</i> 15 1 5 2 2 3
C-1 Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-6	Upon comp to plan, ma Case study Introductio Project ma Mind Mapp CPM and C Case study	led into variou r: management m and course re- nagement methases: strategy p bing for Project N CPM methodolo r in project sche	, monitor, and co es forms of instr of building project equirements. Safe nodology: PRINCE hase, planning ph Management 1999 eduling	ntrol a project uction It based on selected Ity measures on bui 2, Waterfall, and Ag	l examples Iding site, individual and ile		-	<i>hours</i> 15 1 5 2 2
C-1 Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-3 T-W-5 T-W-5 T-W-6 Student	Upon comp to plan, ma Content divid Case study Introductio Project ma Project pha Mind Mapp CPM and C Case study workload - fo	led into variou anage, organize led into variou anagement anagement meth ases: strategy p bing for Project N CPM methodolo an project sche forms of activit	, monitor, and co es forms of instr of building project equirements. Safe nodology: PRINCE hase, planning ph Management 1999 eduling	ntrol a project uction It based on selected Ity measures on bui 2, Waterfall, and Ag	l examples Iding site, individual and ile		-	<i>hours</i> 15 1 5 2 2 3 2 2
C-1 Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-6 Student A-P-1	Upon comp to plan, ma Case study Introductio Project ma Project pha Mind Mapp CPM and C Case study workload - fa Class Parti	led into variou (ed into variou (: management on and course re- nagement meth- ases: strategy p oing for Project N CPM methodolo (in project sche forms of activity cipation	, monitor, and co es forms of instr of building project equirements. Safe nodology: PRINCE hase, planning ph Management 1999 eduling	ntrol a project uction It based on selected Ity measures on bui 2, Waterfall, and Ag	l examples Iding site, individual and ile		Number of	hours 15 1 5 2 3 2 3 2 3 2 3 1 5 1
C-1 Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-6 Student A-P-1 A-P-2	Upon comp to plan, ma Case study Introductio Project ma Project pha Mind Mapp CPM and C Case study <i>workload - fa</i> Class Partio	led into variou r: management management methases: strategy p ing for Project N CPM methodolo r in project sche orms of activit cipation reparation	, monitor, and co es forms of instr of building project equirements. Safe nodology: PRINCE hase, planning ph Management 1999 eduling	ntrol a project uction It based on selected Ity measures on bui 2, Waterfall, and Ag	l examples Iding site, individual and ile		Number of	ibours 15 1 5 2 3 2 3 2 3 1 5 1 5 15 15 15
C-1 Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 Student A-P-1 A-P-2 A-W-1	Upon comp to plan, ma Content divid Case study Introductio Project ma Project pha Mind Mapp CPM and C Case study workload - fo Class Partio Class Partio	oletion of this co anage, organize led into variou v: management on and course re nagement meth ases: strategy p bing for Project N CPM methodolo v in project sche forms of activit cipation reparation cipation	, monitor, and co es forms of instr of building project equirements. Safe nodology: PRINCE hase, planning ph Management egy eduling	ntrol a project uction It based on selected ity measures on bui 2, Waterfall, and Ag nase, realization pha	l examples lding site, individual and ile ase, closure phase		Number of	i 15 1 5 2 3 2 3 2 3 15 15 15 15 15 15 15 15
C-1 Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-6 Student A-P-1 A-P-2 A-W-1 A-W-2	Upon comp to plan, ma Content divid Case study Introductio Project ma Mind Mapp CPM and C Case study workload - fo Class Partio Exercise pu Class Partio	oletion of this co anage, organize led into variou y: management on and course re nagement meth ases: strategy p bing for Project N CPM methodolo y in project sche forms of activit cipation reparation cipation nt analysis of le	, monitor, and co es forms of instr of building project equirements. Safe nodology: PRINCE hase, planning ph Management egy eduling	ntrol a project uction It based on selected Ity measures on bui 2, Waterfall, and Ag	l examples lding site, individual and ile ase, closure phase		Number of	index 15 1 5 2 3 2 3 2 3 2 3 15 15 15 15 15 15 7
C-1 Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 Student A-P-1 A-P-2 A-W-1 A-W-2 A-W-3	Upon comp to plan, ma Case study Introductio Project ma Project pha Mind Mapp CPM and C Case study Workload - fa Class Partia Exercise pl Class Partia Independe Preparation	led into variou r: management r: management r: management ren and course ren nagement methases: strategy p ring for Project N CPM methodolo rin project sche forms of activit cipation reparation cipation nt analysis of len n for the exam	, monitor, and co es forms of instr of building project equirements. Safe nodology: PRINCE hase, planning ph Management egy eduling	ntrol a project uction It based on selected ity measures on bui 2, Waterfall, and Ag nase, realization pha	l examples lding site, individual and ile ase, closure phase		Number of	index 15 1 5 2 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 15 15 7 7
C-1 Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-3 T-W-5 T-W-6 Student A-P-1 A-P-2 A-W-1 A-W-2 A-W-3 A-W-4	Upon comp to plan, ma Content divid Case study Introductio Project ma Project pha Mind Mapp CPM and C Case study workload - fo Class Partio Exercise pl Class Partio Independe Preparation Final exam	oletion of this co anage, organize led into variou y: management on and course re nagement methases: strategy p oing for Project N CPM methodolo y in project sche forms of activit cipation reparation cipation nt analysis of le n for the exam	, monitor, and co es forms of instr of building project equirements. Safe nodology: PRINCE hase, planning ph Management egy eduling	ntrol a project uction It based on selected ity measures on bui 2, Waterfall, and Ag nase, realization pha	l examples lding site, individual and ile ase, closure phase		Number of	index 15 1 5 2 3 2 3 2 3 2 3 15 15 15 15 15 15 7
C-1 Course of T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 Student A-P-1 A-P-2 A-W-1 A-W-2 A-W-3 A-W-4 Teaching	Upon comp to plan, ma Case study Introductio Project ma Project pha Mind Mapp CPM and C Case study <i>workload - fa</i> Class Partia Class Partia Independe Preparation Final exam	letion of this co anage, organize led into variou r: management on and course re nagement meth ases: strategy p bing for Project N CPM methodolo r in project sche forms of activit cipation reparation cipation nt analysis of le n for the exam tools	, monitor, and co es forms of instr of building project equirements. Safe nodology: PRINCE hase, planning ph Management egy eduling	ntrol a project uction It based on selected ity measures on bui 2, Waterfall, and Ag nase, realization pha	l examples lding site, individual and ile ase, closure phase		Number of	i 15 1 5 2 2 3 2 i <t< td=""></t<>
C-1 Course of T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 Student A-P-1 A-P-2 A-W-1 A-W-2 A-W-3 A-W-4 Teaching	Upon comp to plan, ma Case study Introductio Project ma Project pha Mind Mapp CPM and C Case study <i>workload - fa</i> Class Partia Class Partia Independe Preparation Final exam	oletion of this co anage, organize led into variou y: management on and course re nagement methases: strategy p oing for Project N CPM methodolo y in project sche forms of activit cipation reparation cipation nt analysis of le n for the exam	, monitor, and co es forms of instr of building project equirements. Safe nodology: PRINCE hase, planning ph Management egy eduling	ntrol a project uction It based on selected ity measures on bui 2, Waterfall, and Ag nase, realization pha	l examples lding site, individual and ile ase, closure phase		Number of	ibours 15 1 5 2 2 3 2 ibours 15 15 15 7 7
C-1 Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 Student A-P-1 A-P-2 A-W-1 A-W-2 A-W-1 A-W-2 A-W-3 A-W-4 Teaching M-1	Upon comp to plan, ma Content divid Case study Introductio Project ma Project pha Mind Mapp CPM and C Case study workload - fo Class Partio Exercise pr Class Partio Independe Preparation Final exam g methods / for Lecture, ca	letion of this co anage, organize led into variou r: management on and course re nagement meth ases: strategy p bing for Project N CPM methodolo r in project sche forms of activit cipation reparation cipation nt analysis of le n for the exam tools	, monitor, and co es forms of instr of building project equirements. Safe nodology: PRINCE hase, planning ph Management gy duling	ntrol a project uction It based on selected ity measures on bui 2, Waterfall, and Ag nase, realization pha	l examples lding site, individual and ile ase, closure phase		Number of	i 15 1 5 2 2 3 2 i <t< td=""></t<>
C-1 Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 Student A-P-1 A-P-2 A-W-1 A-W-2 A-W-1 A-W-2 A-W-3 A-W-4 Teaching M-1	Upon comp to plan, ma Case study Introductio Project ma Project pha Mind Mapp CPM and C Case study Workload - fa Class Partia Exercise pr Class Partia Independe Preparation Final exam g methods / Lecture, ca	led into variou reanage, organize led into variou reanagement n and course re- nagement methases: strategy p bing for Project N CPM methodolo reparation cipation nt analysis of le n for the exam tools ase studies	, monitor, and co es forms of instr of building project equirements. Safe nodology: PRINCE hase, planning ph Management gy eduling ty ecture content and content and re, P - final)	ntrol a project uction It based on selected ity measures on bui 2, Waterfall, and Ag nase, realization pha	l examples lding site, individual and ile ase, closure phase		Number of	i 15 1 5 2 2 3 2 3 2 5 15 15 15 7 7
C-1 Course of T-P-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 Student A-P-1 A-P-2 A-W-1 A-W-2 A-W-3 A-W-3 A-W-4 Teaching M-1 Evaluation	Upon comp to plan, ma Content divid Case study Introductio Project ma Project pha Mind Mapp CPM and C Case study workload - fo Class Partio Exercise pr Class Partio Independe Preparation Final exam g methods / Lecture, ca on methods	led into variou r: management and course re- nagement methases: strategy p ing for Project N CPM methodolo r in project sche forms of activit cipation reparation cipation nt analysis of le n for the exam tools ase studies (F - progressiv	, monitor, and co es forms of instr of building project equirements. Safe nodology: PRINCE hase, planning ph Management gy eduling ty ecture content and content and re, P - final)	ntrol a project uction It based on selected ity measures on bui 2, Waterfall, and Ag nase, realization pha	l examples lding site, individual and ile ase, closure phase		Number of	i 15 1 5 2 2 3 2 3 2 5 15 15 15 7 7
C-1 Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 Student A-P-1 A-P-2 A-W-1 A-W-2 A-W-1 A-W-2 A-W-3 A-W-3 A-W-4 Teaching M-1 Evaluation S-1	Upon comp to plan, ma Case study Introductio Project ma Project pha Mind Mapp CPM and C Case study Workload - fa Class Partia Independe Preparation Final exam g methods / Lecture, ca on methods	led into variou reanage, organize led into variou reanagement an and course re- nagement methases: strategy p bing for Project N CPM methodolo reparation cipation nt analysis of le n for the exam tools ase studies (F - progressive binuous assession	, monitor, and co es forms of instr of building project equirements. Safe nodology: PRINCE hase, planning ph Management gy eduling ty eduling ty ecture content and re, P - final) ment	ntrol a project <i>uction</i> t based on selected ty measures on bui 2, Waterfall, and Ag hase, realization pha d literature recognit Reference to the learning outcomes Reference to the learning outcomes	l examples lding site, individual and ile ase, closure phase		Number of	<i>hours</i> 15 1 5 2 3 2 <i>hours</i> 15 15 15 15 15 15 15 15 15 15 16 17 1

B-A_2A_W14	P7S_WK_TA21	P7S_WK_IA21	C-1	T-W-1 T-W-2 T-W-3	T-W-4 T-W-5 T-W-6	M-1	S-1 S-2
B-A_2A_U23	P7S_UW_TA23		C-1	T-P-1		M-1	S-1
B-A_2A_K06	P7S_KR		C-1	T-P-1 T-W-1 T-W-2 T-W-3	T-W-4 T-W-5 T-W-6	M-1	S-1 S-2
	B-A_2A_U23	B-A_2A_U23 P75_UW_TA23	B-A_2A_U23 P75_UW_TA23	B-A_2A_U23 P75_UW_TA23 C-1	B-A_2A_U23 P7S_UW_TA23 C-1 T-P-1 B-A_2A_K06 P7S_KR C-1 T-P-1	B-A_2A_U23 P7S_UW_TA23 C-1 T-W-3 T-W-6 B-A_2A_K06 P7S_KR C-1 T-P-1 T-W-4	B-A_2A_U23 P7S_UW_TA23 C-1 T-W-3 T-W-6 B-A_2A_K06 P7S_KR C-1 T-P-1 M-1

1. M.D.Alam, U.F.Guehl, Project-management in practise. A quideline and toolbox for successful projects, Springer, 2017

						_	
Field of st	udy	Civil I	Engineering				
Mode of st	tudy	statio	onary	Level	second cycle		
Graduate'	s qualification	magi	ster			WBi/	4
Area(s) of	study	nauki	techniczne				<u>`</u>
Education	al profile	gene	ral academic				
Module		-					
Course un	it	Basio	cs of Bridge Er	ngineering			
Code			/S2CE/ES/D/03	<u> </u>		- 1 1	
	ecialisation		eering Structure	۵۵		- \	
	ring faculty	-	dra Dróg i Mostó				
ECTS		3,0		ECTS (forms)	3,0		
		-				_	
	ourse credit	credit	[S	Language	english	_	
Electives				Elective group			1
Form of in	struction	Code	Semester	Hours	ECTS	Weight	Credit
project co	urse	Р	1	30	1,5	0,44	credits
lecture		W	1	15	1,5	0,56	credits
Leading te	eacher	Hołov	vaty Janusz (Jan	usz.Holowaty@zut	.edu.pl)		
Other tead			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	,,,			
Prerequisi							
W-1	Elementary structu	ral ana	lycic				
	_						
	ourse unit objective						
C-1 C-2	Understanding brid Simplified design o	-					
		-					
	ntent divided into						Number of hours
T-P-1	-			/ sizing - material sel	ection. al materials, pavement	s karbs safaty	3
T-P-2	barriers, other fittir		age cross section.			s, keids, salety	6
Т-Р-3				ending moments and			6
T-P-4					for bending and shear		5
T-P-5	General drawings o			-			
T-P-6	Drawing of a bridge	e detail	Drojact cumman				8
T-W-1							2
T-W-2	-		lges. Bridge desig	n standards and spe			2
	Actions on bridges:	perma	lges. Bridge desig ment actions, vari	n standards and spe able actions and live	cifications. Ioads. Load models.		2 2 1
T-W-3	Actions on bridges: Basic bridge types.	perma Memb	dges. Bridge desig anent actions, vari ers in bridge struc	n standards and spe able actions and live ctures.	loads. Load models.		2 2 1 2
T-W-3 T-W-4	Actions on bridges: Basic bridge types. Bridge geometrics.	perma Memb Basic I	dges. Bridge desig ment actions, vari ers in bridge struc bridge materials. I	n standards and spe able actions and live ctures. Bridge accessories. L	loads. Load models.		2 2 1 2 1 2 4
T-W-3 T-W-4 T-W-5	Actions on bridges: Basic bridge types. Bridge geometrics. Analysis of bridges	perma Memb Basic I . Influa	dges. Bridge desig anent actions, vari ers in bridge struc bridge materials. I nce linesw. Comp	n standards and spe able actions and live ctures. Bridge accessories. L uter analysis.	loads. Load models. ecture summary l.		2 2 1 2
T-W-3 T-W-4 T-W-5 T-W-6	Actions on bridges: Basic bridge types. Bridge geometrics. Analysis of bridges Bridge structural sy	perma Memb Basic I . Influa	dges. Bridge desig ment actions, vari ers in bridge struc bridge materials. I nce linesw. Comp . Examples of brid	n standards and spe able actions and live ctures. Bridge accessories. L	loads. Load models. ecture summary l.		2 2 1 2 4 4 4 2
T-W-3 T-W-4 T-W-5 T-W-6 Student w	Actions on bridges: Basic bridge types. Bridge geometrics. Analysis of bridges Bridge structural sy porkload - forms of	perma Memb Basic I Influa (stems)	dges. Bridge desig ment actions, vari ers in bridge struc bridge materials. I nce linesw. Comp . Examples of brid	n standards and spe able actions and live ctures. Bridge accessories. L uter analysis.	loads. Load models. ecture summary l.		2 2 1 2 4 4 4 2 Number of hours
T-W-3 T-W-4 T-W-5 T-W-6 Student w A-P-1	Actions on bridges: Basic bridge types. Bridge geometrics. Analysis of bridges Bridge structural sy forkload - forms of Project attendance	perma Memb Basic I Influa stems	dges. Bridge desig ment actions, vari ers in bridge struc bridge materials. I nce linesw. Comp . Examples of brid	n standards and spe able actions and live ctures. Bridge accessories. L uter analysis.	loads. Load models. ecture summary l.		2 2 1 2 4 4 4 2 <i>Number of hours</i> 30
T-W-3 T-W-4 T-W-5 T-W-6 Student w A-P-1 A-P-2	Actions on bridges: Basic bridge types. Bridge geometrics. Analysis of bridges Bridge structural sy orkload - forms of Project attendance Structural calculati	perma Memb Basic I . Influa ystems. <i>activit</i> ons	dges. Bridge desig ment actions, vari ers in bridge struc bridge materials. I nce linesw. Comp . Examples of brid	n standards and spe able actions and live ctures. Bridge accessories. L uter analysis.	loads. Load models. ecture summary l.		2 2 1 2 4 4 4 2 <i>Number of hours</i> 30 8
T-W-3 T-W-4 T-W-5 T-W-6 Student w A-P-1 A-P-2 A-P-3	Actions on bridges: Basic bridge types. Bridge geometrics. Analysis of bridges Bridge structural sy forkload - forms of Project attendance	perma Memb Basic I . Influa ystems <i>activit</i> ons	dges. Bridge desig ment actions, vari ers in bridge struc bridge materials. I nce linesw. Comp . Examples of brid	n standards and spe able actions and live ctures. Bridge accessories. L uter analysis.	loads. Load models. ecture summary l.		2 2 1 2 4 4 4 2 <i>Number of hours</i> 30
T-W-3 T-W-4 T-W-5 T-W-6 Student w A-P-1 A-P-2	Actions on bridges: Basic bridge types. Bridge geometrics. Analysis of bridges Bridge structural sy <i>orkload - forms of</i> Project attendance Structural calculation	perma Memb Basic I Influa ystems <i>activit</i> ons	dges. Bridge desig ment actions, vari ers in bridge struc bridge materials. I nce linesw. Comp . Examples of brid ty	n standards and spe able actions and live ctures. Bridge accessories. L uter analysis.	loads. Load models. ecture summary l.		2 2 1 2 1 2 4 4 4 2 <i>Number of hours</i> 30 8 7
T-W-3 T-W-4 T-W-5 T-W-6 Student w A-P-1 A-P-2 A-P-3 A-W-1	Actions on bridges: Basic bridge types. Bridge geometrics. Analysis of bridges Bridge structural sy corkload - forms of Project attendance Structural calculation Structural drawings Lecture attendance	perma Memb Basic I Influa ystems. <i>activit</i> ons s s standa	dges. Bridge desig anent actions, vari ers in bridge struc bridge materials. I nce linesw. Comp . Examples of brid ty	n standards and spe able actions and live ctures. Bridge accessories. L uter analysis.	loads. Load models. ecture summary l.		2 2 1 2 4 4 4 2 <i>Number of hours</i> 30 8 7 15
T-W-3 T-W-4 T-W-5 T-W-6 Student w A-P-1 A-P-2 A-P-3 A-W-1 A-W-2	Actions on bridges: Basic bridge types. Bridge geometrics. Analysis of bridges Bridge structural sy orkload - forms of Project attendance Structural calculation Structural drawings Lecture attendance Study of literature,	perma Memb Basic I Influa ystems. <i>activit</i> ons s s standa	dges. Bridge desig anent actions, vari ers in bridge struc bridge materials. I nce linesw. Comp . Examples of brid ty	n standards and spe able actions and live ctures. Bridge accessories. L uter analysis.	loads. Load models. ecture summary l.		2 2 1 2 4 4 4 2 <i>Number of hours</i> 30 8 7 15 15
T-W-3 T-W-4 T-W-5 T-W-6 Student w A-P-1 A-P-2 A-P-3 A-W-1 A-W-2 A-W-2 A-W-3 A-W-4	Actions on bridges: Basic bridge types. Bridge geometrics. Analysis of bridges Bridge structural sy <i>orkload - forms of</i> Project attendance Structural calculation Structural drawings Lecture attendance Study of literature, Preparetion for lect Consultations	perma Memb Basic I Influa ystems. <i>activit</i> ons s s standa	dges. Bridge desig anent actions, vari ers in bridge struc bridge materials. I nce linesw. Comp . Examples of brid ty	n standards and spe able actions and live ctures. Bridge accessories. L uter analysis.	loads. Load models. ecture summary l.		2 2 1 1 2 4 4 4 2 2 <i>Number of hours</i> 30 8 7 7 15 15 12
T-W-3 T-W-4 T-W-5 T-W-6 Student w A-P-1 A-P-2 A-P-3 A-W-1 A-W-2 A-W-2 A-W-3 A-W-4	Actions on bridges: Basic bridge types. Bridge geometrics. Analysis of bridges Bridge structural sy orkload - forms of Project attendance Structural calculation Structural drawings Lecture attendance Study of literature, Preparetion for lect	perma Memb Basic I Influa ystems <i>activit</i> ons s s standa ures ar	dges. Bridge desig anent actions, vari ers in bridge struc bridge materials. I nce linesw. Comp . Examples of brid ty	n standards and spe able actions and live ctures. Bridge accessories. L uter analysis.	loads. Load models. ecture summary l.		2 2 1 1 2 4 4 4 2 2 <i>Number of hours</i> 30 8 7 7 15 15 12
T-W-3 T-W-4 T-W-5 Student w A-P-1 A-P-2 A-P-3 A-W-1 A-W-2 A-W-3 A-W-3 A-W-4 Teaching w	Actions on bridges: Basic bridge types. Bridge geometrics. Analysis of bridges Bridge structural sy <i>orkload - forms of</i> Project attendance Structural calculation Structural drawings Lecture attendance Study of literature, Preparetion for lect Consultations <i>methods / tools</i>	perma Memb Basic I Influa ystems <i>activit</i> ons s s standa ures ar	dges. Bridge desig anent actions, vari ers in bridge struc bridge materials. I nce linesw. Comp . Examples of brid ty	n standards and spe able actions and live ctures. Bridge accessories. L uter analysis.	loads. Load models. ecture summary l.		2 2 1 1 2 4 4 4 2 2 <i>Number of hours</i> 30 8 7 7 15 15 12

Evaluatio	n meth	ods (F - progressive, P - final)								
S-1	F	Grading of lectures and project work								
5-2	F	Execution of a bridge design project								
	Desig	ned learning outcomes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Cours	e content	Teaching methods	Evaluation methods
Knowledg	<i>je</i>						1		1	
	ngineer ca	an recognize types of bridge structures and ral calculations of bridge members.	B-A_2A_W01	P75_WG_TA21	P75_WG_IA21	C-1 C-2	T-P-1 T-P-2 T-P-3 T-P-4 T-P-5 T-P-6	T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6	M-1 M-2	S-1 S-2
Skills										
	ngineer is	able to use basic standards and technical eering structures.	B-A_2A_U01	P7S_UK		C-1 C-2	T-P-1 T-P-2 T-P-3 T-P-4 T-P-5 T-P-6	T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6	M-1 M-2	S-1 S-2
Other soc	cial / pe	rsonal competences	1							
	ngineer ol	ptains the basis for constant learning, care ted works, compliance of professional	B-A_2A_K01	Р75_КК		C-1 C-2	T-P-1 T-P-2 T-P-3 T-P-4 T-P-5 T-P-6	T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6	M-1 M-2	S-1 S-2
Required	reading	2								
1. Troitsky	• M.S., Pl	anning and Design of Bridges, John Wi	ley & Sons, New	York - Toront	o, 1994					
2. Tonias [D.E., Zha	o J.J., Bridge Engineering, MCGrawHill	, New York - Lone	don - Toronto,	2007, Second	d Editio	n			
3. Bridge [Design to	Eurocodes. Worked Examples, JRC Eu	uropean Commis	sion, Europea	n Union, 2012	2, JRC 68	8415			
Suppleme	entary i	reading								
1. Ghosh L	J.K., Des	ign and Construction of Steel Bridges,	Taylor & francis	, London, 200	6					
2. Akessor	n B., Und	erstanding Bridge Collapses, Taylor &	Francis, London	- New York, 2	008					
3. Bridge [Design to	Eurocodes. Simplified rules for use ir	n student project	, SCI, Berkshir	re, 2011, RT11	.56				

Field of s								<u></u>				
	study		Civil E	ngineering								
Mode of	study		statior	nary	Level	second	cycle					
Graduat	e's quali	fication	magis	ter	_	I		V	VBi/	4		
Area(s)	of study		nauki	techniczne						<u>`</u>		_
Educatio	onal profi	ile	genera	al academic				1 [ПΕ		
Module									- 11			
Course ι	unit		Civil E	Engineering					- 11		ピ	
Code			WBIA/	S2CE/ES/D/04					- 11		ΠП	
Field of s	specialis	ation	Engine	ering Structur	es			1				
Adminis	tering fa	culty	Katedı	a Budownictw	a Ogólnego				\square			
ECTS			3,0		ECTS (forms)	3,0		1				
Form of	course c	redit	exami	nation	Language	english		1				
Electives	s				Elective group			-				
Form of	instructi	on	Code	Semester	Hours		ECTS	We	eight		Credit	
project o			P	1	30		1,5		,50		credite	
lecture			W	1	15		1,5		,50		aminat	-
	toachar			_			1,5		,			
_	teacher			_	lowak@zut.edu. .Jaworski@zut.eo	-	ak Rafał (Raf	al Now	/ak@zut	t.edu n	I). Skil	bicki
Other te	eachers				bicki@zut.edu.p						i), 3ki	oreixi
Prerequi	isites											
W-1	Streng	th of materia	ls (basi	c)								
	,	nit objective										
Module/	course u	int objective	25									
Module/ C-1		-		structural engine	eering							
C-1 C-2	Basic I	knowledge of	timber		eering r timber structures	5						
C-1	Basic I Basic I	knowledge of knowledge of	timber Europe		r timber structures	5						
C-1 C-2 C-3	Basic I Basic I Basic I	knowledge of knowledge of knowledge of	timber Europe moderr	an Standards for	r timber structures esign principles	5				Numb	ber of	hours
C-1 C-2 C-3	Basic I Basic I Basic I Content c Design	knowledge of knowledge of knowledge of <i>divided into</i> n and detailing	timber Europe moderr various g of ligh	an Standards for a construction de s forms of instr at wood framed b	r timber structures esign principles ruction puilding with truss	girder.				Numb	ber of	hours 30
C-1 C-2 C-3 Course c	Basic I Basic I Basic I Content C Design Gener	knowledge of knowledge of knowledge of divided into and detailing al design star timber struct	timber Europe moderr various g of ligh	an Standards for a construction de s forms of instr at wood framed k and procedures f	timber structures esign principles ruction	girder. es. The princi	ples of constr uildings. New	ucting l types of	ight	Numt	per of	
C-1 C-2 C-3 Course c T-P-1	Basic I Basic I Basic I Content c Desigr Gener frame buildir	knowledge of knowledge of <i>knowledge of</i> <i>divided into</i> and detailing al design star timber struct ngs.	timber Europe moderr various g of ligh ndards a ures. St	an Standards for a construction de <i>s forms of instr</i> at wood framed b and procedures f ceel framed build	r timber structures esign principles <i>uction</i> puilding with truss or timber structur	girder. es. The princi e to timber bi	uildings. New	ucting l types of	ight	Numb	per of	30
C-1 C-2 C-3 Course c T-P-1 T-W-1 T-W-2	Basic I Basic I Basic I Content C Desigr Gener- frame buildir Constr	knowledge of knowledge of <i>knowledge of</i> <i>divided into</i> and detailing al design star timber struct ngs.	timber Europe moderr various g of ligh ndards a ures. St bles of h	an Standards for a construction de <i>s forms of instr</i> at wood framed k and procedures f ceel framed build nigh buildings. M	r timber structures esign principles fuction puilding with truss or timber structur lings as alternative	girder. es. The princi e to timber bi	uildings. New	ucting I types of	ight f	Numt		30 9 6
C-1 C-2 C-3 Course c T-P-1 T-W-1 T-W-2	Basic I Basic I Basic I Content c Desigr Gener- frame buildir Constr	knowledge of knowledge of knowledge of divided into and detailing al design star timber struct ngs. ruction princip	timber Europe moderr various g of ligh ndards a ures. St bles of h	an Standards for a construction de <i>s forms of instr</i> at wood framed k and procedures f ceel framed build nigh buildings. M	r timber structures esign principles fuction puilding with truss or timber structur lings as alternative	girder. es. The princi e to timber bi	uildings. New	ucting l types of	ight f			30 9 6
C-1 C-2 C-3 Course o T-P-1 T-W-1 T-W-2 Student	Basic I Basic I Basic I Content C Desigr Gener frame buildir Constr workload	knowledge of knowledge of knowledge of divided into a and detailing al design star timber struct ngs. ruction princip d - forms of	timber Europe modern various g of ligh ndards a ures. St bles of h activity	an Standards for a construction de <i>s forms of instr</i> at wood framed k and procedures f ceel framed build nigh buildings. M	r timber structures esign principles fuction puilding with truss or timber structur lings as alternative	girder. es. The princi e to timber bi	uildings. New	ucting I types of	ight f			30 9 6 hours
C-1 C-2 C-3 Course c T-P-1 T-W-1 T-W-2 Student A-P-1 A-P-2 A-W-1	Basic I Basic I Basic I Content C Desigr Gener frame buildir Constr Workload Desigr Indivic Partici	knowledge of knowledge of knowledge of divided into a and detailing al design star timber struct ngs. ruction princip d - forms of n workshop dual student w pation in clas	timber Europe modern various g of ligh ndards a ures. St bles of h activity vork ses	an Standards for a construction de <i>s forms of instr</i> at wood framed k and procedures f ceel framed build nigh buildings. M	r timber structures esign principles fuction puilding with truss or timber structur lings as alternative	girder. es. The princi e to timber bi	uildings. New	ucting l types of	ight f			30 9 6 hours 15 30 15
C-1 C-2 C-3 Course c T-P-1 T-W-1 T-W-2 Student A-P-1 A-P-2	Basic I Basic I Basic I Content C Desigr Gener frame buildir Constr Workload Desigr Indivic Partici	knowledge of knowledge of knowledge of divided into and detailing al design star timber struct ngs. ruction princip d - forms of n workshop dual student w	timber Europe modern various g of ligh ndards a ures. St bles of h activity vork ses	an Standards for a construction de <i>s forms of instr</i> at wood framed k and procedures f ceel framed build nigh buildings. M	r timber structures esign principles fuction puilding with truss or timber structur lings as alternative	girder. es. The princi e to timber bi	uildings. New	ucting I types of	ight f			30 9 6 hours 15 30
C-1 C-2 C-3 Course c T-P-1 T-W-1 T-W-2 Student A-P-1 A-P-2 A-W-1 A-W-2 Teaching	Basic I Basic I Basic I Content C Desigr Gener frame buildir Constr Workload Desigr Indivic Partici Indivic g methoo	knowledge of knowledge of knowledge of divided into and detailing al design star timber struct ngs. ruction princip d - forms of n workshop dual student w pation in clas dual student w	timber Europe modern various g of ligh ndards a ures. St bles of h activity vork ses	an Standards for a construction de <i>s forms of instr</i> at wood framed k and procedures f ceel framed build nigh buildings. M	r timber structures esign principles fuction puilding with truss or timber structur lings as alternative	girder. es. The princi e to timber bi	uildings. New	ucting l types of	ight f			30 9 6 hours 15 30 15
C-1 C-2 C-3 Course c T-P-1 T-W-1 T-W-2 Student A-P-1 A-P-2 A-W-1 A-W-2 Teaching M-1	Basic I Basic I Basic I Content o Desigr Gener frame buildir Constr workload Desigr Indivic Partici g methoo	knowledge of knowledge of knowledge of divided into and detailing al design start timber struct ngs. ruction princip d - forms of n workshop dual student w pation in clas dual student w ds / tools res	timber Europe modern various g of ligh ndards a ures. St bles of h activity vork ses	an Standards for a construction de <i>s forms of instr</i> at wood framed k and procedures f ceel framed build nigh buildings. M	r timber structures esign principles fuction puilding with truss or timber structur lings as alternative	girder. es. The princi e to timber bi	uildings. New	ucting l types of	ight f			30 9 6 hours 15 30 15
C-1 C-2 C-3 Course c T-P-1 T-W-1 T-W-2 Student A-P-1 A-P-2 A-W-1 A-W-2 Teaching M-1 M-2	Basic I Basic I Basic I Content C Desigr Gener frame buildir Constr Workload Desigr Indivic Partici Indivic g methoo Lectur Desigr	knowledge of knowledge of knowledge of divided into an detailing al design star timber struct ngs. ruction princip d - forms of n workshop dual student w pation in clas dual student w ds / tools res n workshop	timber Europe modern various g of ligh ndards a ures. St bles of h activity vork ses vork	an Standards for n construction de s forms of instr nt wood framed k and procedures f ieel framed build high buildings. M	r timber structures esign principles fuction puilding with truss or timber structur lings as alternative	girder. es. The princi e to timber bi	uildings. New	ucting l types of	ight f			30 9 6 hours 15 30 15
C-1 C-2 C-3 Course of T-P-1 T-W-1 T-W-2 Student A-P-1 A-P-2 A-W-1 A-W-2 Teaching M-1 M-2 Evaluati	Basic I Basic I Basic I Desigr Gener frame buildir Constr workload Desigr Indivic g method Lectur Desigr	knowledge of knowledge of knowledge of divided into a and detailing al design star- timber struct ngs. ruction princip d - forms of n workshop dual student w pation in clas dual student w ds / tools res n workshop ods (F - prog	timber Europe moderr various g of ligh ndards a ures. St bles of h activity vork ses vork	an Standards for n construction de s forms of instr nt wood framed k and procedures f ieel framed build high buildings. M	r timber structures esign principles fuction puilding with truss or timber structur lings as alternative	girder. es. The princi e to timber bi	uildings. New	ucting l types of	ight f			30 9 6 hours 15 30 15
C-1 C-2 C-3 Course of T-P-1 T-W-1 T-W-2 Student A-P-1 A-P-2 A-W-1 A-W-2 Teaching M-1 M-2 Evaluation S-1	Basic I Basic I Basic I Content C Desigr Gener- frame buildir Constr Workload Desigr Indivic Partici Indivic g method Lectur Desigr	knowledge of knowledge of knowledge of divided into and detailing al design star timber struct ngs. ruction princip d - forms of n workshop dual student w pation in clas dual student w ds / tools res n workshop ods (F - prog Written exar	timber Europe modern various g of ligh ndards a ures. St bles of h activity vork ses vork ses vork	an Standards for n construction de s forms of instr nt wood framed k and procedures f ieel framed build high buildings. M	r timber structures esign principles fuction puilding with truss or timber structur lings as alternative	girder. es. The princi e to timber bi	uildings. New	ucting l types of	ight f			30 9 6 hours 15 30 15
C-1 C-2 C-3 Course of T-P-1 T-W-1 T-W-2 Student A-P-1 A-P-2 A-W-1 A-W-2 Teaching M-1 M-2 Evaluati	Basic I Basic I Basic I Desigr Gener frame buildir Constr workload Desigr Indivic g method Lectur Desigr	knowledge of knowledge of knowledge of divided into a and detailing al design star- timber struct ngs. ruction princip d - forms of n workshop dual student w pation in clas dual student w ds / tools res n workshop ods (F - prog	timber Europe modern various g of ligh ndards a ures. St bles of h activity vork ses vork ses vork	an Standards for n construction de s forms of instr nt wood framed k and procedures f ieel framed build high buildings. M	r timber structures esign principles fuction puilding with truss or timber structur lings as alternative	girder. es. The princi e to timber bi	uildings. New	ucting l types of	ight f			30 9 6 hours 15 30 15
C-1 C-2 C-3 Course of T-P-1 T-W-1 T-W-2 Student A-P-1 A-P-2 A-W-1 A-W-2 Teaching M-1 M-2 Evaluation S-1	Basic I Basic I Basic I Desigr Gener- frame buildir Constr workload Desigr Indivic g method Lectur Desigr Con method P P	knowledge of knowledge of knowledge of divided into and detailing al design star timber struct ngs. ruction princip d - forms of n workshop dual student w pation in clas dual student w ds / tools res n workshop ods (F - prog Written exar	timber Europe modern various g of ligh ndards a ures. St oles of h activity vork ses vork ses vork	an Standards for n construction de s forms of instr nt wood framed b and procedures f ceel framed build high buildings. M / e, P - final)	r timber structures esign principles fuction puilding with truss or timber structur lings as alternative	girder. es. The princi e to timber bi	uildings. New	ucting I types of	ight f	Numb		30 9 6 hours 15 30 15 30
C-1 C-2 C-3 Course of T-P-1 T-W-1 T-W-2 Student A-P-1 A-P-2 A-W-1 A-W-2 Teaching M-1 M-2 Evaluation S-1	Basic I Basic I Basic I Content C Desigr Gener- frame buildir Constr Workload Desigr Indivic Partici Indivic g method Lectur Desigr Oesigr On metho P P	knowledge of knowledge of knowledge of divided into and detailing al design star timber struct ngs. ruction princip d - forms of n workshop dual student w pation in clas dual student w ds / tools res n workshop ods (F - prog Written exar Project work	timber Europe modern various g of ligh ndards a ures. St oles of h activity vork ses vork ses vork	an Standards for n construction de s forms of instr nt wood framed b and procedures f ceel framed build high buildings. M / e, P - final)	Reference to the learning outcomes designed for the fields of study	girder. es. The princi e to timber bu tic structural	analysis. analysis.	Course	f	Numb	Der of	30 9 6 hours 15 30 15 30
C-1 C-2 C-3 Course of T-P-1 T-W-1 T-W-2 Student A-P-1 A-P-2 A-W-1 A-W-2 Teaching M-1 M-2 Evaluation S-1 S-2 Knowled B-A_2A_ES	Basic I Basic I Basic I Content C Design Gener, frame buildir Constr Workload Design Indivic Partici Indivic g method Lectur Design Con metho P P Design dge	knowledge of knowledge of knowledge of divided into and detailing al design start timber struct togs. ruction princip d - forms of n workshop dual student w pation in clas dual student w ds / tools res n workshop ods (F - prog Written exar Project work	timber Europe moderr various g of ligh adards a ures. St bles of h activity vork ses vork gressive m cs	an Standards for n construction de s forms of instr nt wood framed b and procedures f ceel framed build high buildings. M / e, P - final) mes	Reference to the learning outcomes Reference to the learning outcomes designed for the fields of study	girder. es. The princi e to timber bu tic structural	analysis. analysis.	Course	f Course co	Numb	Der of	30 9 6 hours 15 30 15 30

B-A_2A_ES/D/03_U01 Student can set up the loading acting on structure according to European Standards. Student can design of light frame timber structure.	B-A_2A_U01 B-A_2A_U21	P7S_UK P7S_UW_TA24		C-1 C-2	T-P-1 T-W-1	T-W-2	M-2	S-2
Other social / personal competences								
B-A_2A_ES/D/03_K01 Student understand rule of design of light framed timber structures and new modern buildings.	B-A_2A_K04 B-A_2A_K06	P7S_KK P7S_KR		C-1 C-2 C-3	T-P-1 T-W-1	T-W-2	M-1 M-2	S-1 S-2
Required reading								
1. Porteous, J., Kermani, A., Structural Timber Design to E	Eurocode 5, Blac	kwell Publishir	ng, 2007					
2. EN 1990: Eurocode - Basis of structural design, 2011								
3. Eurocode 1: Actions of structures, parts: EN 1991-1-1;	EN 1991-1-3; E	N 1991-1-4, 20	11					
4. EN 19951-1: Eurocode 5: Design of timber structures,	2011							
Supplementary reading								
1. Hugues, T., Steiger L., Weber, J., Timber Construction.	Details. Product	ts. Case studie	s., 2011					

Field of s	tudy	Civil E	Ingineering				
Mode of :	study	statio	nary	Level	second cycle		
Graduate	e's qualification	magis	ster			WBi/	7
Area(s) o	of study	nauki	techniczne				·
Educatio	nal profile	gener	al academic				
Module						-	
Course u	nit	Preca	ast Concrete S	tructures			
Code			/S2CE/ES/D/05			-	
	pecialisation	-	eering Structure	25		- \	
	ering faculty	-		elbetowych i Tech	nologii Potonu		
		2,0		-	2,0		
ECTS				ECTS (forms)		_	
	course credit	credit	S	Language	english	_	
Electives				Elective group			1
Form of i	instruction	Code	Semester	Hours	ECTS	Weight	Credit
project c	ourse	Р	1	15	0,8	0,50	credits
lecture		W	1	30	1,2	0,50	credits
Leading	teacher	Horsz	czaruk Elżbieta	(Elzbieta.Horszcza	ruk@zut.edu.pl)		
Other tea		Brzoz	owski Piotr (Piot		.edu.pl), Visiting Pro	fessor (Visiting	@zut.edu.pl),
Prerequis	sites						
W-1		e of any	specialty in Civil	Engineering as full-t	ime or extramural stuc	lies	
Module/c	ourse unit objectiv	۵۲					
C-1			of structures des	signed with precast o	oncrete elements		
C-2	Ability to evaluate						
С-3	Ability to design an	d dime	nsion precast con	crete elements and t	their joints		
C-4	Ability to design ar	id dime	nsion precast con	crete elements and	their joints		
Course c	ontent divided into	variou	s forms of instru	uction			Number of hours
T-P-1					ulations for vertical an		15
T-W-1	Basic terms of pred				tical and horizontal joi	nts and lintel	1
T-W-1 T-W-2	•			esigning the precast	structures		2
T-W-3		-		building and indust			2
T-W-4	-			diagrams of precast			2
T-W-5	Work of the stiffne						1
T-W-6	conditions for the o	missior	n of the horizontal	loads and torque in	n of the loads on the st the calculations; simp tiffening wall sections	lified models in	10
T-W-7	Forces inside the w vertical continuous			Load transferred from	m the ceiling; forces in	walls due to	2
T-W-8	Bearing capacity o	f the wa	II located betwee	-			2
T-W-9	Strained areas in the schematics and be				aring capacity of horizo	ontal joints;	4
T-W-10	Precast ceiling plat	es. Role	e of the reinforced	l concrete tie beams			2
T-W-11	Examples of reinfo	rced co	ncrete joints in pr	ecast building frame			2
Student	workload - forms of	activit	У				Number of hours
A-P-1	Participation in clas						15
A-P-2	Individual preparat		esign assignment				7
A-P-3	Preparation for gra						1
A-P-4	Controlled Assessn	-					1
A-W-1	Participation in lect						30
A-W-2	Preparations for th	e exam					4

Student	workloa	d - forms of activity						Num	ber of	hours
A-W-3	Taking	j an exam								2
Teaching	g metho	ds / tools								
M-1	Lectur	e								
М-2	Projec	t								
Evaluatio	on meth	ods (F - progressive, P - final)								
S-1	Р	Written exam								
5-2	Р	Assessment of the project								
	Desig	ned learning outcomes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course	e content	Teaching methods	Evaluation methods
Knowled	ge		•	•						1
made from	ls the conc precast co	litions of the static work of structures ncrete elements, including design rules of system and joint work	B-A_2A_W05 B-A_2A_W08 B-A_2A_W10	P7S_WG_TA21	P7S_WG_IA21	C-1 C-2 C-3 C-4	T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5	T-W-6 T-W-7 T-W-8 T-W-9 T-W-10 T-W-11	M-1 M-2	S-1 S-2
Skills										
spatial stiff	the buildir ness and e	ng frame of precast structures including ffect of horizontal loads, choice of joints s and preparations of design drawings	B-A_2A_U08 B-A_2A_U13 B-A_2A_U15 B-A_2A_U20 B-A_2A_U21	P7S_UO P7S_UW_TA22 P7S_UW_TA23 P7S_UW_TA24	P75_UW_IA24	C-1 C-2 C-3 C-4	T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5	T-W-6 T-W-7 T-W-8 T-W-9 T-W-10 T-W-11	M-1 M-2	S-1 S-2
Other so	cial / pe	rsonal competences		1	1					
CE_2A_ES/E Has awarer upgrading p	ness of the	need for individual studying and al skills	B-A_2A_K06	P75_KR		C-1 C-2 C-3 C-4	T-P-1 T-W-5 T-W-6 T-W-7	T-W-8 T-W-9 T-W-10 T-W-11	M-1 M-2	S-1 S-2
Required	d reading	1		•					•	
		, oniolo, Marco di Prisco, Michele Win T	ai Mak, Reinforce	ed Concrete D	esign to Euro	code 2,	Springe	er Verlag	g GmbH	, 2017
2. W H Mc	osley, Rei	nforced Concrete Design, PALGRAVE I	MACMILLAN, 201	2						
3. Millais,	Malcolm,	Building structures : from concepts to	o design, Spon P	ress, New Yor	k, 2005					
4. MacGre	egor, Jam	es Grierson, Reinforced concrete : me	chanics and desi	gn, Pearson P	rentice Hall, 2	006				
5. A. M. N	eville, Pro	operties of concrete, London, 2011								
		Construkcje żelbetowe, według EC2 t.								
		rocode2 :Design of concrete structure								
8. EN 199	2-3, Euro	code 2 - Design of conrete structures	- Part 3: Liquid r	etainig and co	ntaiment stru	ctures,	2006			
Supplem	nentary r	eading								
1 FN 199	0. Furoco	de - Basic of structural design, 2002								

Field of st	tudy	Civil I	Engineering	1			
Mode of s	study	statio	onary	Level	second cycle		
Graduate	's qualification	magi	ster			WBiA	4
Area(s) of	f study	nauki	i techniczne				
Education	nal profile	gene	ral academic				
Module							n ILn I
Course ur	nit	Sust	ainable Consti	ruction			
Code		WBIA	/S2CE/ES/D/06-3	1			
Field of sp	pecialisation	-	eering Structur				
Administe	ering faculty	Archi	dra Mieszkalnict tektury		nniczno-Ekologicznych		
ECTS		2,0		ECTS (forms)	2,0		
Form of c	ourse credit	credit	ts	Language	english		
Electives		7		Elective group			
Form of ir	nstruction	Code	Semester	Hours	ECTS	Weight	Credit
project co	ourse	Р	1	15	1,0	0,50	credits
lecture		W	1	15	1,0	0,50	credits
Leading to	eacher	Janus	zkiewicz Krysty	na (Krystyna.Janu	szkiewicz@zut.edu.pl)		
<i>Other tea</i>	chers	Visiti	ng Professor (Vi	siting@zut.edu.pl			
Prerequis	ites						
							ation masterial
W-1	performance, MEP	, law reg	gulations. Operati	ve in structural des	hnical aspects such as ge gn programs, BIM - not ne ects of building structures	ecessary course	programs. Basic
	performance, MEP knowledge of sust	, law reg ainable	gulations. Operati	ve in structural des	hnical aspects such as ge gn programs, BIM - not ne ects of building structures	ecessary course	programs. Basic
	performance, MEP knowledge of sust. ourse unit objectiv The aim of the cou Construction is the broad coverage in of the green buildi	, law reg ainable res rse is to leading cluding ng proc	gulations. Operati development and o increase knowle g reference for the architecture, eng ess, from materia	ve in structural des I the ecological aspe dge in structural de e design, constructi ineering, and constr Ils selection to build	gn programs, BIM - not ne ects of building structures sign and the sustainable on, and operation of high uction this course deliver ing systems and more.	ecessary course structural engine performance gr s detailed inforr	programs. Basic eering. Sustainable een buildings. With nation on all aspects
Module/co	performance, MEP knowledge of sust. ourse unit objectiv The aim of the cou Construction is the broad coverage in of the green buildi	, law reg ainable res rse is to leading cluding ng proc oping sk	gulations. Operati development and o increase knowle g reference for the architecture, eng ess, from materia kills in implementa	ve in structural des I the ecological aspe dge in structural de e design, constructi ineering, and constr Ils selection to build	gn programs, BIM - not ne ects of building structures sign and the sustainable s on, and operation of high uction this course deliver	ecessary course structural engine performance gr s detailed inforr	programs. Basic eering. Sustainable een buildings. With nation on all aspects
Module/co C-1 C-2	performance, MEP knowledge of sust ourse unit objectiv The aim of the cou Construction is the broad coverage in of the green buildi Additionally develo structural enginee	, law reg ainable es rse is to leading cluding ng proc oping sk ring stu	gulations. Operati development and o increase knowle g reference for the architecture, eng ess, from materia kills in implementa dents. Is forms of instr	dge in structural des dge in structural de e design, constructi ineering, and constr ils selection to build ation of digital tools uction	gn programs, BIM - not ne ects of building structures sign and the sustainable s on, and operation of high uction this course deliver ing systems and more. during design process. Co	ecessary course structural engin- performance gr s detailed inforr purse can integr	programs. Basic eering. Sustainable een buildings. With nation on all aspects
Module/co C-1 C-2 Course co T-P-1	performance, MEP knowledge of sust ourse unit objectiv The aim of the cou Construction is the broad coverage in of the green buildi Additionally develo structural enginee ontent divided into The task is to desi- landscape, located	, law reg ainable es rse is to leading cluding ng proc pping sku variou gn a lan l close t	gulations. Operati development and g reference for the architecture, eng ess, from materia cills in implementa dents. <i>Is forms of instr</i> offorms, public us to a large urban a	dge in structural des dge in structural des e design, constructi ineering, and constr ls selection to build ation of digital tools uction e structural object i rea, e.g. the city of	gn programs, BIM - not ne ects of building structures sign and the sustainable s on, and operation of high uction this course deliver ing systems and more. during design process. Co n a municipality with an a Szczecin.	ecessary course structural engin- performance gr s detailed inforr purse can integr ttractive	programs. Basic eering. Sustainable een buildings. With nation on all aspects ate architecture and
Module/co C-1 C-2 Course co	performance, MEP knowledge of sust ourse unit objectiv The aim of the cou Construction is the broad coverage in- of the green buildi Additionally develor structural enginee ontent divided into The task is to desi- landscape, located How currently structure	, law rea ainable res res is to leading cluding ng proc oping sku ring stu variou gn a lan l close t ctural e	gulations. Operati development and o increase knowle g reference for the architecture, eng ess, from materia cills in implementa dents. <i>Is forms of instr</i> indforms, public us to a large urban all engineers should i	ive in structural des I the ecological aspe- dge in structural de e design, constructi- ineering, and constr ils selection to build ation of digital tools uction e structural object i rea, e.g. the city of ncorporate sustaina	gn programs, BIM - not ne ects of building structures sign and the sustainable s on, and operation of high uction this course deliver ing systems and more. during design process. Co n a municipality with an a Szczecin. bility concepts in their de	ecessary course structural engin- performance gr s detailed inforr purse can integr ttractive signs.	programs. Basic eering. Sustainable een buildings. With nation on all aspects ate architecture and Number of hours
Module/co C-1 C-2 Course co T-P-1	performance, MEP knowledge of sust ourse unit objectiv The aim of the cou Construction is the broad coverage in of the green buildi Additionally develd structural enginee ontent divided into The task is to desi- landscape, located How currently stru Innovative method faced during plan	, law reg ainable es rrse is to leading cluding ng proc pring stu variou gn a lan close t ctural e s addre ing and	gulations. Operati development and g reference for the architecture, eng ess, from materia cills in implementa dents. <i>Is forms of instr</i> offorms, public us to a large urban an engineers should in ess the environme d design of buildin	ive in structural des I the ecological aspe- dge in structural de e design, constructi- ineering, and constr ils selection to build ation of digital tools uction e structural object i rea, e.g. the city of ncorporate sustaina ental impact, energy gs.	gn programs, BIM - not ne ects of building structures sign and the sustainable s on, and operation of high uction this course deliver ing systems and more. during design process. Co n a municipality with an a Szczecin. bility concepts in their de use, and other sustainab	ecessary course structural engin- performance gr s detailed inforr purse can integr ttractive signs. ility issues	programs. Basic eering. Sustainable een buildings. With nation on all aspects ate architecture and <i>Number of hours</i> 15
Module/co C-1 C-2 Course co T-P-1 T-W-1	performance, MEP knowledge of sust ourse unit objectiv The aim of the cou. Construction is the broad coverage in of the green buildi Additionally develor structural enginee ontent divided into The task is to desi- landscape, located How currently strut Innovative method faced during plann Five sustainable st Production Energy	, law reg ainable es rse is to leading cluding ng proc pping sk ring stu variou gn a lan close t ctural e s addre ing and ructura , Minimi	gulations. Operati development and g reference for the architecture, eng ess, from materia cills in implementa dents. <i>Is forms of instr</i> doforms, public us to a large urban an engineers should in ess the environme d design of buildin I design methodo izing Embodied Er	ive in structural des I the ecological aspe- dge in structural de e design, constructi- ineering, and constru- ils selection to build ation of digital tools <i>uction</i> e structural object i rea, e.g. the city of ncorporate sustaina ental impact, energy gs. logies: Minimizing M	gn programs, BIM - not ne ects of building structures sign and the sustainable s on, and operation of high uction this course deliver ing systems and more. during design process. Co n a municipality with an a Szczecin. bility concepts in their de	ecessary course structural engin- performance gr s detailed inforr ourse can integr ttractive signs. ility issues aterial	programs. Basic eering. Sustainable een buildings. With nation on all aspects ate architecture and <i>Number of hours</i> 15 1
Module/co C-1 C-2 Course co T-P-1 T-W-1 T-W-2	performance, MEP knowledge of sust ourse unit objectiv The aim of the cou. Construction is the broad coverage in of the green buildi Additionally develd structural enginee ontent divided into The task is to desi- landscape, located How currently stru Innovative method faced during plann Five sustainable st Production Energy Maximizing Structu	, law reg ainable es rse is to e leading cluding ng proc opping sk ring stu variou gn a lan close t ctural e is addre ing and ructura , Minimi ural Sys nto the o	gulations. Operati development and g reference for the architecture, eng ess, from materia dents. <i>Is forms of instr</i> adforms, public us to a large urban an engineers should in ess the environme d design of buildin I design methodo izing Embodied Er tem Reuse. qualification and c	ive in structural des I the ecological aspe- edesign, constructi- ineering, and constr- ils selection to build ation of digital tools <i>uction</i> e structural object i rea, e.g. the city of ncorporate sustaina ental impact, energy gs. logies: Minimizing M hergy, Life-Cycle An	gn programs, BIM - not ne ects of building structures sign and the sustainable s on, and operation of high uction this course deliver ing systems and more. during design process. Co n a municipality with an a Szczecin. bility concepts in their de use, and other sustainab laterial Use, Minimizing M	ecessary course structural engin- performance gr s detailed inforr ourse can integr ttractive signs. ility issues aterial ent, and	programs. Basic eering. Sustainable een buildings. With nation on all aspects ate architecture and <i>Number of hours</i> 15 1 1
Module/co C-1 C-2 Course co T-P-1 T-W-1 T-W-2 T-W-3	performance, MEP knowledge of sust ourse unit objectiv The aim of the cou. Construction is the broad coverage in of the green buildi Additionally develd structural enginee ontent divided into The task is to desi- landscape, located How currently stru Innovative method faced during plann Five sustainable st Production Energy Maximizing Structu Research review in materials and met	, law reg ainable es rse is to leading cluding ng proc pring stu variou gn a lan close t ctural e s addre ing and ructura , Minimi ural Sys to the o hods for	gulations. Operati development and g reference for the architecture, eng ess, from materia dills in implementa dents. <i>Is forms of instr</i> deforms, public us to a large urban an engineers should in ess the environme d design of buildin I design methodo izing Embodied Er tem Reuse. qualification and o	ive in structural des I the ecological aspe- dge in structural de e design, constructi- ineering, and constr ils selection to build ation of digital tools <i>uction</i> e structural object i rea, e.g. the city of ncorporate sustaina ental impact, energy gs. logies: Minimizing M nergy, Life-Cycle An development of the nvironmental impact	gn programs, BIM - not ne ects of building structures sign and the sustainable s on, and operation of high uction this course deliver ing systems and more. during design process. Co n a municipality with an a Szczecin. bility concepts in their de use, and other sustainab laterial Use, Minimizing M alysis/Inventory/Assessme sustainable properties of	ecessary course structural engin- performance gr s detailed inforr purse can integr ttractive signs. ility issues aterial ent, and construction	programs. Basic eering. Sustainable een buildings. With nation on all aspects ate architecture and <i>Number of hours</i> 15 1 1 1
Module/co C-1 C-2 Course co T-P-1 T-W-1 T-W-2 T-W-2 T-W-3 T-W-4	performance, MEP knowledge of sust ourse unit objectiv The aim of the cou Construction is the broad coverage im of the green buildi Additionally develo structural enginee ontent divided into The task is to desi- landscape, located How currently stru Innovative methoo faced during plan Five sustainable st Production Energy Maximizing Structu Research review ir materials and met Curvilinear structu Parametric digital	, law reg ainable res res is to eleading cluding ng proc oping sk ring stu variou variou gn a lan close t ctural e s addre ing and ructura , Minimi ural Sys to the o hods foo ral enve tools an	gulations. Operati development and o increase knowle g reference for the architecture, eng ess, from materia dents. <i>Is forms of instr</i> offorms, public us to a large urban al engineers should in ess the environme d design of buildin I design methodo I design methodo I design methodo cizing Embodied Er tem Reuse. qualification and co r optimizing the e elops in current building	ive in structural des i the ecological aspe- e design, constructi- ineering, and constru- ils selection to build ation of digital tools <i>uction</i> e structural object i rea, e.g. the city of ncorporate sustaina ental impact, energy gs. logies: Minimizing M hergy, Life-Cycle An development of the nvironmental impact uilding engineering ainable building stru	gn programs, BIM - not ne ects of building structures sign and the sustainable s on, and operation of high uction this course deliver ing systems and more. during design process. Co n a municipality with an a Szczecin. bility concepts in their de use, and other sustainab laterial Use, Minimizing M alysis/Inventory/Assessme sustainable properties of t of structural design. and reduction wind loads. ctures.	ecessary course structural engin- performance gr s detailed inforr ourse can integr ttractive signs. ility issues aterial ent, and construction	programs. Basic eering. Sustainable een buildings. With nation on all aspects ate architecture and Number of hours 15 1 1 1 1
Module/co C-1 C-2 Course co T-P-1 T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5	performance, MEP knowledge of sust ourse unit objectiv The aim of the cou Construction is the broad coverage im of the green buildi Additionally develd structural enginee ontent divided into The task is to desi landscape, located How currently stru Innovative methoo faced during plan Five sustainable st Production Energy Maximizing Structu Research review ir materials and met Curvilinear structu Parametric digital Research review ir relative to a struct	, law reg ainable res res is to leading cluding ng proc oping sk ring stu variou yariou gn a lan close t ctural e s addre ing and ructura , Minimi ural Sys to the o hods for ral enve tools an ito the o	gulations. Operati development and o increase knowle g reference for the architecture, eng ess, from materia dents. <i>Is forms of instr</i> offorms, public us to a large urban an engineers should in the environme d design of buildin I design methodo izing Embodied Er tem Reuse. qualification and co r optimizing the e elops in current build d designing sustai effect that structure verall sustainable	ive in structural des I the ecological aspe- de design, constructi- ineering, and constru- ils selection to build ation of digital tools <i>uction</i> e structural object i rea, e.g. the city of ncorporate sustaina ental impact, energy gs. logies: Minimizing M nergy, Life-Cycle An development of the nvironmental impact uilding engineering ainable building stru tral form, system an qualities (planning,	gn programs, BIM - not ne ects of building structures sign and the sustainable s on, and operation of high uction this course deliver ing systems and more. during design process. Co n a municipality with an a Szczecin. bility concepts in their de use, and other sustainab laterial Use, Minimizing M alysis/Inventory/Assessme sustainable properties of t of structural design. and reduction wind loads. ctures. d magnitude have on buil design and implementation	ecessary course structural engin- performance gr s detailed inforr ourse can integr ttractive signs. ility issues aterial ent, and construction ding design on).	programs. Basic eering. Sustainable een buildings. With nation on all aspects ate architecture and <i>Number of hours</i> 15 1 1 1 1 1 1
Module/co C-1 C-2 Course co T-P-1 T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-6	performance, MEP knowledge of sust ourse unit objectiv The aim of the cou Construction is the broad coverage im of the green buildi Additionally develo structural enginee ontent divided into The task is to desi landscape, located How currently stru Innovative methoo faced during plant Five sustainable st Production Energy Maximizing Structu Research review ir materials and met Curvilinear structu Parametric digital Research review ir relative to a struct	, law reg ainable res rrse is to leading ng proc oping sk ring stu variou yan a lan consect consect consect ructural e s addre ing and ructura dis addre ing and ructura , Minimi ural Sys to the o hods for ral enve tools an ito the o ure's ov roject's rs and a	gulations. Operati development and o increase knowle g reference for the architecture, eng ess, from materia dents. <i>Is forms of instr</i> odforms, public us to a large urban an engineers should in design of buildin I design methodo izing Embodied Er tem Reuse. qualification and co r optimizing the e elops in current build designing susta effect that structury verall sustainable form, structural s architects in attem	ive in structural des i the ecological aspe- de design, constructi- ineering, and constru- ils selection to build ation of digital tools <i>uction</i> e structural object i rea, e.g. the city of ncorporate sustaina ental impact, energy gs. logies: Minimizing M nergy, Life-Cycle An development of the nvironmental impact uilding engineering ainable building stru tral form, system an qualities (planning, system and magnitu npts to achieve mor	gn programs, BIM - not ne ects of building structures sign and the sustainable s on, and operation of high uction this course deliver ing systems and more. during design process. Co n a municipality with an a Szczecin. bility concepts in their de use, and other sustainab laterial Use, Minimizing M alysis/Inventory/Assessme sustainable properties of t of structural design. and reduction wind loads. ctures. d magnitude have on buil design and implementation de directly relate the issue e sustainable structural design.	ecessary course structural engin- performance gr s detailed inforr ourse can integr ttractive signs. ility issues aterial ent, and construction ding design on). es facing both esigns.	programs. Basic eering. Sustainable een buildings. With nation on all aspects ate architecture and <i>Number of hours</i> 15 1 1 1 1 1 1 1 1
Module/co C-1 C-2 Course co T-P-1 T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-6 T-W-7	performance, MEP knowledge of sust ourse unit objectiv The aim of the cou Construction is the broad coverage im of the green buildi Additionally develo structural enginee ontent divided into The task is to desi landscape, located How currently stru Innovative methoo faced during plant Five sustainable st Production Energy Maximizing Structu Research review ir materials and met Curvilinear structu Parametric digital Research review ir relative to a struct	, law reg ainable res res is to leading ng proc oping sk ring stu variou yan a lan construction ructural e s addre ing and ructura dis addre ing and ructura , Minimi ural Sys to the o hods for ral enve tools an ito the o ure's ov roject's rs and a Leaders	gulations. Operati development and o increase knowle g reference for the architecture, eng ess, from materia dents. <i>Is forms of instr</i> odforms, public us to a large urban an engineers should in a design of buildin I design methodo izing Embodied Er tem Reuse. qualification and co r optimizing the e elops in current build designing susta effect that structure verall sustainable form, structural s architects in attem ship in Energy and	ive in structural des i the ecological aspe- de design, constructi- ineering, and constru- ils selection to build ation of digital tools <i>uction</i> e structural object i rea, e.g. the city of ncorporate sustaina ental impact, energy gs. logies: Minimizing M nergy, Life-Cycle An development of the nvironmental impact uilding engineering ainable building stru tral form, system an qualities (planning, system and magnitu npts to achieve mor	gn programs, BIM - not ne ects of building structures sign and the sustainable s on, and operation of high uction this course deliver ing systems and more. during design process. Co n a municipality with an a Szczecin. bility concepts in their de use, and other sustainab laterial Use, Minimizing M alysis/Inventory/Assessme sustainable properties of t of structural design. and reduction wind loads. ctures. d magnitude have on buil design and implementation de directly relate the issu	ecessary course structural engin- performance gr s detailed inforr ourse can integr ttractive signs. ility issues aterial ent, and construction ding design on). es facing both esigns.	programs. Basic eering. Sustainable een buildings. With nation on all aspects ate architecture and <i>Number of hours</i> 15 1 1 1 1 1 1 1 1 1
Module/co C-1 C-2 Course co T-P-1 T-W-1 T-W-2 T-W-3 T-W-3 T-W-3 T-W-6 T-W-6 T-W-7 T-W-8	performance, MEP knowledge of sust ourse unit objectiv The aim of the cou Construction is the broad coverage in of the green buildi Additionally develd structural enginee ontent divided into The task is to desi- landscape, located How currently stru Innovative method faced during plan Five sustainable st Production Energy Maximizing Structu Research review ir materials and met Curvilinear structu Parametric digital Research review ir relative to a struct The aspects of a p structural enginee Review of current applicability for structu	, law req ainable res res is to eleading cluding ng proc oping sk ring stu variou ya a lan close t ctural e s addre ing and ructural s addre ing and ructural g addre ing andre ing a	gulations. Operati development and greference for the architecture, eng ess, from materia dents. <i>Is forms of instru-</i> dents. <i>Is forms of instru-</i> dents, public us to a large urban al engineers should in the sign of buildin I design methodo izing Embodied Er tem Reuse. qualification and cor r optimizing the e elops in current build affect that structure verall sustainable form, structural s architects in attem ship in Energy and system design. ry with using ESO	ive in structural des I the ecological aspe- e design, constructi- ineering, and constr- ils selection to build ation of digital tools <i>uction</i> e structural object i rea, e.g. the city of ncorporate sustaina ental impact, energy gs. logies: Minimizing M hergy, Life-Cycle An development of the nvironmental impact uilding engineering ainable building stru tral form, system an qualities (planning, system and magnitu npts to achieve mor d Environmental Des evolutionary digital	gn programs, BIM - not ne ects of building structures sign and the sustainable s on, and operation of high uction this course deliver ing systems and more. during design process. Co n a municipality with an a Szczecin. bility concepts in their de use, and other sustainab laterial Use, Minimizing M alysis/Inventory/Assessme sustainable properties of t of structural design. and reduction wind loads. ctures. d magnitude have on buil design and implementation de directly relate the issu e sustainable structural de- ign Green Building docum optimization tools.	ecessary course structural engin- performance gr s detailed inforr ourse can integr ttractive signs. ility issues aterial ent, and construction ding design on). es facing both esigns. nent's	programs. Basic eering. Sustainable een buildings. With nation on all aspects ate architecture and <i>Number of hours</i> 15 1 1 1 1 1 1 1 1 1 1 1 1
Module/co C-1 C-2 Course co T-P-1 T-W-1 T-W-2 T-W-3 T-W-3 T-W-3 T-W-3 T-W-3 T-W-3 T-W-3 T-W-8 T-W-7	performance, MEP knowledge of sust ourse unit objectiv The aim of the cou Construction is the broad coverage in of the green buildi Additionally develd structural enginee ontent divided into The task is to desi- landscape, located How currently stru Innovative methoo faced during plan Five sustainable st Production Energy Maximizing Structu Research review ir materials and met Curvilinear structu Parametric digital Research review ir relative to a struct The aspects of a p structural enginee Review of current applicability for str Shaping complex of Presentation and r design.	, law rea ainable es irse is tre e leading cluding ng proc oping sk ring stu variou ya a lan close t ctural e ls addre ing and ructural s addre ing and ructural e hods foi ral enve tools ar not the o ure's ov roject's rs and a Leaders uctural geometic	gulations. Operati development and o increase knowle g reference for the architecture, eng ess, from materia dents. <i>Is forms of instru-</i> dents, public us to a large urban al engineers should in the sthe environme d design of buildin I design methodo izing Embodied Er tem Reuse. qualification and or r optimizing the e elops in current build d designing susta effect that structure verall sustainable form, structural s architects in attem ship in Energy and system design. ry with using ESO of the role project	ive in structural des i the ecological aspe- dige in structural de e design, constructi- ineering, and constru- ils selection to build ation of digital tools <i>uction</i> e structural object i rea, e.g. the city of ncorporate sustaina ental impact, energy gs. logies: Minimizing M hergy, Life-Cycle An development of the nvironmental impact uilding engineering ainable building stru irral form, system an qualities (planning, system and magnitu npts to achieve mor d Environmental Des evolutionary digital size and material ty	gn programs, BIM - not ne ects of building structures sign and the sustainable s on, and operation of high uction this course deliver ing systems and more. during design process. Co n a municipality with an a Szczecin. bility concepts in their de use, and other sustainab laterial Use, Minimizing M alysis/Inventory/Assessme sustainable properties of t of structural design. and reduction wind loads. ctures. d magnitude have on buil design and implementation de directly relate the issu e sustainable structural de- ign Green Building docum optimization tools. pe play in structural and s	ecessary course structural engin- performance gr s detailed inforr ourse can integr ttractive signs. ility issues aterial ent, and construction ding design on). es facing both esigns. hent's sustainable	programs. Basic eering. Sustainable een buildings. With nation on all aspects ate architecture and <i>Number of hours</i> 15 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Module/co C-1 C-2 Course co T-P-1 T-W-1 T-W-2 T-W-3 T-W-3 T-W-3 T-W-3 T-W-3 T-W-3 T-W-3 T-W-3 T-W-3 T-W-3 T-W-9 T-W-9 T-W-10	performance, MEP knowledge of sust ourse unit objectiv The aim of the cou Construction is the broad coverage im of the green buildi Additionally develd structural enginee ontent divided into The task is to desi- landscape, located How currently stru Innovative methoo faced during plan Five sustainable st Production Energy Maximizing Structu Research review ir materials and met Curvilinear structu Parametric digital Research review ir relative to a struct The aspects of a p structural enginee Review of current applicability for str Shaping complex of Presentation and r design.	, law reg ainable es irse is tre e leading cluding ng proc oping sk ring stu variou yan a lan close t ctural e ls addre ing and ructural s addre ing and ructural e s addre tools an to the o ure's ov roject's rs and a Leaders uctural geometic eview o	gulations. Operati development and o increase knowle g reference for the architecture, eng ess, from materia dents. <i>Is forms of instru-</i> dents, public us to a large urban al engineers should in the sthe environme d design of buildin I design methodo izing Embodied Er tem Reuse. qualification and or r optimizing the e elops in current build d designing susta effect that structur verall sustainable form, structural s architects in attem ship in Energy and system design. ry with using ESO of the role project	ive in structural des i the ecological aspe- dige in structural de e design, constructi- ineering, and constru- ils selection to build ation of digital tools <i>uction</i> e structural object i rea, e.g. the city of ncorporate sustaina ental impact, energy gs. logies: Minimizing M hergy, Life-Cycle An development of the nvironmental impact uilding engineering ainable building stru irral form, system an qualities (planning, system and magnitu npts to achieve mor d Environmental Des evolutionary digital size and material ty	gn programs, BIM - not ne ects of building structures sign and the sustainable s on, and operation of high uction this course deliver ing systems and more. during design process. Co n a municipality with an a Szczecin. bility concepts in their de use, and other sustainab laterial Use, Minimizing M alysis/Inventory/Assessme sustainable properties of t of structural design. and reduction wind loads. ctures. d magnitude have on buil design and implementation de directly relate the issu e sustainable structural de- ign Green Building docum optimization tools. pe play in structural and so mree major construction m	ecessary course structural engin- performance gr s detailed inforr ourse can integr ttractive signs. ility issues aterial ent, and construction ding design on). es facing both esigns. hent's sustainable	programs. Basic eering. Sustainable een buildings. With nation on all aspects ate architecture and <i>Number of hours</i> 15 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Module/co C-1 C-2 Course co T-P-1 T-W-1 T-W-2 T-W-3 T-W-3 T-W-3 T-W-3 T-W-3 T-W-3 T-W-3 T-W-3 T-W-3 T-W-3 T-W-10 T-W-10 T-W-11	performance, MEP knowledge of sust ourse unit objectiv The aim of the cou. Construction is the broad coverage in of the green buildi Additionally develd structural enginee ontent divided into The task is to desi- landscape, located How currently stru Innovative method faced during plann Five sustainable st Production Energy Maximizing Structu Research review ir materials and met Curvilinear structu Parametric digital Research review ir relative to a struct The aspects of a p structural enginee Review of current applicability for structu Shaping complex of presentation and r design. Presentation and c cast-in-place reinfo	, law rea ainable res rrse is to eleading cluding ng proc pping sk ring stu variou yariou gn a lan close t ctural e is addre ing and ructura to the o hods for ral enve tools an ato the o ure's ov roject's rs and a Leaders uctural geometri eview o	gulations. Operati development and o increase knowle g reference for the architecture, eng ess, from materia dills in implementa dents. <i>Is forms of instr</i> offorms, public us to a large urban all engineers should in the sign of buildin I design methodo izing Embodied Er tem Reuse. qualification and c r optimizing the e elops in current build designing susta effect that structure verall sustainable form, structural s architects in attem ship in Energy and system design. ry with using ESO of the role project	ive in structural des i the ecological aspe- dige in structural de e design, constructi- ineering, and constr ils selection to build ation of digital tools <i>uction</i> e structural object i rea, e.g. the city of ncorporate sustaina ental impact, energy gs. logies: Minimizing M hergy, Life-Cycle An development of the nvironmental impact uilding engineering ainable building stru tral form, system an qualities (planning, system and magnitu pts to achieve mor d Environmental Des evolutionary digital size and material ty cainability plays in the ressed/precast concest struction type (wood	gn programs, BIM - not ne ects of building structures sign and the sustainable s on, and operation of high uction this course deliver, ing systems and more. during design process. Co n a municipality with an a Szczecin. bility concepts in their de use, and other sustainab laterial Use, Minimizing M alysis/Inventory/Assessme sustainable properties of t of structural design. and reduction wind loads. ctures. d magnitude have on buil design and implementation de directly relate the issu e sustainable structural de ign Green Building docum optimization tools. pe play in structural and s nree major construction m rete). en structures).	ecessary course structural engin- performance gr s detailed inforr ourse can integr ttractive signs. ility issues aterial ent, and construction ding design on). es facing both esigns. nent's sustainable naterials (steel,	programs. Basic eering. Sustainable een buildings. With nation on all aspects ate architecture and <i>Number of hours</i> 15 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Module/co C-1 C-2 Course co T-P-1 T-W-1 T-W-2 T-W-3 T-W-3 T-W-3 T-W-3 T-W-3 T-W-3 T-W-3 T-W-3 T-W-10 T-W-10 T-W-11 T-W-12	performance, MEP knowledge of sust ourse unit objectiv The aim of the cou Construction is the broad coverage in of the green buildi Additionally develd structural enginee ontent divided into The task is to desi- landscape, located How currently stru Innovative method faced during plann Five sustainable st Production Energy Maximizing Structu Research review ir materials and met Curvilinear structu Parametric digital Research review ir relative to a struct The aspects of a p structural enginee Review of current applicability for str Shaping complex of Presentation and r design. Presentation and re Sustainable desigr	, law reg ainable res rrse is tre eleading cluding ng proc oping sk ring stu variou gn a lan close t ctural e ls addre ing and ructural s addre ing and ructural e ls addre ing and ructural s addre ing and ructural s addre ing and ructural chods for ral enve tools an to the o ure's ov roject's rs and a Leaders uctural geometr eview o	gulations. Operati development and o increase knowle g reference for the architecture, eng ess, from materia dills in implementa dents. <i>Is forms of instr</i> offorms, public us to a large urban al engineers should in ass the environme d design of buildin I design methodo izing Embodied Er tem Reuse. qualification and c r optimizing the e elops in current build d designing susta effect that structure verall sustainable form, structural s architects in attem ship in Energy and system design. ry with using ESO of the role project on of the role sust oncrete and prest t qualities by cons current the conce	ive in structural des in the ecological aspe- e design, constructi- ineering, and constr- ils selection to build ation of digital tools <i>uction</i> e structural object i rea, e.g. the city of s ncorporate sustaina ental impact, energy gs. logies: Minimizing M hergy, Life-Cycle An development of the nvironmental impact uilding engineering ainable building stru tral form, system an qualities (planning, system and magnitu npts to achieve mor d Environmental Des evolutionary digital size and material ty cainability plays in the ressed/precast concount struction type (wood ept of life cycle anal	gn programs, BIM - not ne ects of building structures sign and the sustainable s on, and operation of high uction this course deliver ing systems and more. during design process. Co n a municipality with an a Szczecin. bility concepts in their de use, and other sustainab laterial Use, Minimizing M alysis/Inventory/Assessme sustainable properties of t of structural design. and reduction wind loads. ctures. d magnitude have on buil design and implementation design and implementation design and implementation design and implementation	ecessary course structural engin- performance gr s detailed inforr ourse can integr ttractive signs. ility issues aterial ent, and construction ding design on). es facing both esigns. hent's sustainable haterials (steel,	programs. Basic eering. Sustainable een buildings. With nation on all aspects ate architecture and <i>Number of hours</i> 15 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

Student w	orkload	l - forms of activity						Num	ber of	hours
A-P-1	Partici	pation in lectures								15
A-P-2	Project	work		_	_					15
A-W-1	Partici	pation in lectures and study required	readings							15
A-W-2	Study I	required and selected supplementary	readings							15
Teaching i	method	ls / tools								
M-1	Lecture	es with Power Point presentations by nics, climate change, net zero buildin shifts in thinking and practice.								
Evaluation	n metho	ods (F - progressive, P - final)								
S-1	Р	Evaluation grade of lectures								
5-2	F	Execution of design project								
	Desigr	ned learning outcomes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course	content	Teaching methods	Evaluation methods
Knowledge	е									
Sustainable C	ical and to Constructi	1 echnological conditions of design ons and their practice. Understands basic relations in the sustainable structural	B-A_2A_W02 B-A_2A_W05	P75_WG_TA21	P75_WG_IA21	C-1 C-2	T-W-2 T-W-3 T-W-4 T-W-5	T-W-8 T-W-9 T-W-10 T-W-11 T-W-12 T-W-13 T-W-14 T-W-15	M-1	S-1 S-2
Skills										
experiments an in	ust the m and uses idividual (l ethod to a structural design task, computer software. In his/her work, engineer attitude which is manifested ach to reality the sustainable structural	B-A_2A_U11 B-A_2A_U16	P7S_UK P7S_UW_TA24		C-1 C-2	T-W-2 T-W-3 T-W-4 T-W-5 T-W-6	T-W-8 T-W-9 T-W-10 T-W-11 T-W-12 T-W-12 T-W-13 T-W-14 T-W-15	M-1	S-1 S-2
Other soci	ial / per	sonal competences								
B-A_2A_ES/D/ Respects and environment.	l protects	L the integrity of the natural and cultural	B-A_2A_K03	P75_KK		C-1 C-2	T-W-2 T-W-3 T-W-4 T-W-5 T-W-6	T-W-8 T-W-9 T-W-10 T-W-11 T-W-12 T-W-13 T-W-13 T-W-14 T-W-15	M-1	S-1 S-2
architectura SGEM 2016 2. Kibert Ch 3. Danatzko	ewicz K. al desigr 5, 2016, n. J., Sus o J.M., Se	and Paszkowska N. E., Climate chang n, Go Green, Hofburg 2-4 November Book 6, Nano, Bio and Green Techno tainable Construction: Green Building ezen H., Sustainable Structural Design S., Green BIM: Successful Sustainable	Vienna 2016, 1 logies for a susta Design and Delin Methodologies,	6th : Internatio ainable Future ivery, John Wil ASCE Library	onal Multidisc , Vol III : 515 ey and Sons, Access provid	iplinary -522. London ded by 2	Scientif , 2016 ZUT, 203	ic Geoc	onferer	nce
design, Inte	ernation	Shaping complex geometry with usin al Multidisciplinary Scientific Geoconfo i K., Concrete Technology for a Susta	erence SGEM, Al	bena, 2017, V	ol.17, No. 62,	pp. 749	9-756.			tural
7. Bollinger 20-25.	K., Grol	nman M., Tessmann O., Form, Force,	Performance. Mu	ılti-parametric	Structural De	esign, A	D, 2008	, Vol. 78	3, No. 2	
buildings, Ir 9. Dh. Yeo, Buildings, E	nternatio R. D. Ga Isevier,	szkiewicz K., A parametric green arch onal Multidisciplinary Scientific Geoco abbai, Sustainable design of reinforce 2011, Vol. 43, Issue 8, pp. 2028-2033	onference SGEM, d concrete struc 3.	Vienna, 2017, tures through	, pp. 735-742. embodied en	ergy op	timizatio	on, Ene		-
		ating, Cooling, Lighting: Sustainable D					ondon, 2	2014		
		Life Cycle Assessment in the Built Env					· - ·			
12. Pabian / 2014	A., Toms	ski P. (ed.), Management in sustainab	le construction i	ndustry, Czest	ochowa Unive	ersity of	lechno	logy, C	zestoch	iowa,
Suppleme	-	-								
11th Centra	al Europ	Glass Fiber-reinforced Concrete as a ean Congress on Concrete Engineerin	ig, HAINBURG (A	USTRIA), 2015	, 363-366 (fu	ll versio	on CD).			
Elsevier Sci 3. Dimčić M Entwerfen,	ence Di liloš, Str Universi	Banachowicz M., Glass as a Compon rect (2016) : 1490-1495., 2016 uctural Optimization of Grid Shells ba ität Stuttgart,, Stuttgart, 2011	sed on Genetic A	Algorithms, Ins	stitut für Tragl	konstru	ktionen	und Ko	nstrukti	ves
4. Januszkie	ewicz K.,	Curvilinear structural envelops in cu	rrent architectur		Civil Engine	- ring Fr	vironm	ent 201	.7. Vol.	10, pp
11-16.		, zkiewicz K., Digial Tectonic Design as			-	-				

Supplementary reading

6. Januszkiewicz K., Evolutionary digital tools in designing nonlinear shaping of concrete structures in current architecture, Central European Congress on Concrete Engineering, Concrete Structures in Urban Areas, Wrocław, 2013
7. Dh. Yeo, R. D. Gabbai, Sustainable design of reinforced concrete structures through embodied energy optimization, Energy and Buildings, Elsevier, 2011, Vol. 43, No. 8., pp. 2028-2033.

8. Moon K. S., Sustainable structural engineering strategies for tall buildings, John Wiley and Sons, London, 2016

Field of s	study		Civil E	Engineering				
Mode of :	study		statio	onary	Level	second cycle		
Graduate	e's qualif	ication	magis	ster			WBi/	7
Area(s) o	of study		nauki	techniczne				·
Educatio	onal profi	le	genei	ral academic				
Module								
Course u	ınit		Sust	ainable Consti	ruction		-	
Code			WBIA	/S2CE/ES/D/06-2	2		- 1 11	
Field of s	specialisa	ation		eering Structure			- \	
Administ	•		-		vli i Materiałów Bu	dowlanych		
ECTS		ulty	2,0		ECTS (forms)	2,0		
Form of a	courso ci	rodit	credit			english		
		eun		15	Language	english		
Electives			7		Elective group			
Form of i		on	Code	Semester	Hours	ECTS	Weight	Credit
project c	ourse		Р	1	15	1,0	0,50	credits
lecture			W	1	15	1,0	0,50	credits
Leading	teacher		Kurtz	-Orecka Karolina	a (Karolina.Kurtz@	zut.edu.pl)		
Other tea	achers					edu.pl), Strzałkowski /gocka-Domagałło A		gocka@zut.edu.pl)
Prerequis	isites							
Prerequis W-1		g Materials,	Civil Er	ngineering				
W-1	Buildin	g Materials, o		ngineering				
W-1	Buildin	nit objective	es		ging climate - Basic I	<nowledge l<="" modern="" of="" td=""><td>ow-energy buildin</td><td>gs design standards</td></nowledge>	ow-energy buildin	gs design standards
W-1 Module/c	Buildin course ur Knowle Skills o	nit objective edge of desig f defining ma	e <i>s</i> In chall ain ene	enges for a changergy demands of b		knowledge of modern l its features - Skills of		
W-1 Module/c C-1 C-2	Buildin course ur Knowle Skills o constru	nit objective edge of desig f defining ma uction for diff	es In chall ain ene ferent o	enges for a chang ergy demands of b climates	building according to	-		utions for
W-1 Module/c C-1 C-2 Course c	Buildin Course ur Knowle Skills o constru	nit objective edge of desig f defining ma uction for diff ivided into	es In chall ain ene ferent o variou	enges for a chang ergy demands of b climates us forms of instru	uction	-		Number of hours
W-1 Module/c C-1 C-2 Course c T-P-1	Buildin Course ur Knowle Skills o constru Content d Design	nit objective edge of desig f defining ma uction for diff ivided into for sustaina	es in chall ain ene ferent o variou bility -	enges for a chang ergy demands of b climates	uction	-		Number of hours
W-1 Module/c C-1 C-2 Course c T-P-1 T-W-1	Buildin COURSE UR Knowle Skills o constru Content d Design Sustair	nit objective edge of desig f defining ma uction for diff ivided into for sustaina nable develop	es in chall ain ene ferent o variou bility - pment	enges for a changergy demands of b climates <i>is forms of instru</i> design for climate	uction e change	-		Number of hours 15 1
W-1 Module/c C-1 C-2 Course c T-P-1 T-W-1 T-W-2	Buildin Course ur Knowle Skills o constru Content d Design Sustair Climate	nit objective edge of desig f defining ma uction for diff ivided into for sustaina nable develop e change and	es in chall ain ene ferent o variou bility - pment d challe	enges for a chang ergy demands of b climates us forms of instru	uction e change	-		Number of hours 15 1 1 1
W-1 Module/c C-1 C-2 Course c T-P-1 T-W-1 T-W-2 T-W-2	Buildin Course un Knowle Skills o constru Content d Design Sustair Climate Buildin	nit objective edge of desig f defining ma action for diff <i>ivided into</i> for sustaina nable develop e change and g energy der	es In chall ain ene ferent o variou bility - pment d challe mands	enges for a changergy demands of b climates <i>is forms of instru</i> design for climate enges for the build	ding environment	-		Number of hours 15 1 1 2
W-1 Module/c C-1 C-2 Course c T-P-1 T-W-1 T-W-2	Buildin Course un Knowle Skills o constru Content d Design Sustair Climate Buildin Conten	nit objective edge of desig f defining ma juction for diff <i>ivided into</i> for sustaina nable develop e change and g energy der nporary low-	es in chall ain ene ferent o variou bility - pment d challe mands energy	enges for a changergy demands of b climates <i>is forms of instru</i> design for climate	ding according to uction e change ding environment	-		Number of hours 15 1 1 1
W-1 Module/c C-1 C-2 Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4	Buildin Course un Skills o constru Content d Design Sustair Climate Buildin Conten Sankey	nit objective edge of desig f defining ma action for diff <i>ivided into</i> for sustaina hable develop e change and g energy der nporary low-o v diagrams -	es in chall ain ene ferent o variou bility - pment d challe mands energy Buildin	enges for a changergy demands of b climates <i>is forms of instru</i> design for climate enges for the build	ding according to uction e change ding environment ds model	-		Number of hours 15 1 1 2 2
W-1 Module/c C-1 C-2 Course c T-P-1 T-W-1 T-W-2 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6	Buildin COURSE UR Knowle Skills o constru Content d Design Sustair Climate Buildin Conten Sankey Design	nit objective edge of desig f defining ma juction for diff <i>ivided into</i> for sustaina hable develop e change and g energy der nporary low- v diagrams - for sustaina	es in chall ain ene ferent of variou bility - pment d challe mands energy Buildin bility -	enges for a change ergy demands of b climates <i>is forms of instru</i> design for climate enges for the build building standard g thermal energy design for climate	ding according to uction e change ding environment ds model	-		Number of hours 15 1 1 1 2 2 3 6
W-1 Module/c C-1 C-2 Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 Student	Buildin Course un Skills o constru Content d Design Sustair Climate Buildin Conten Sankey Design	nit objective edge of desig f defining ma juction for diff ivided into for sustaina hable develop e change and g energy der nporary low r diagrams - for sustaina for sustaina	es in chall ain ene ferent o variou bility - pment d challe mands energy Buildin bility - activit	enges for a change ergy demands of b climates <i>is forms of instru</i> design for climate enges for the build building standard g thermal energy design for climate	ding according to uction e change ding environment ds model	-		Number of hours 15 1 1 2 2 3
W-1 Module/c C-1 C-2 Course c T-P-1 T-W-1 T-W-2 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6	Buildin Course un Skills o constru Content d Design Sustair Climate Buildin Conten Sankey Design	nit objective edge of desig f defining ma juction for diff ivided into for sustaina nable develop e change and g energy der nporary low-o- v diagrams - for sustaina d - forms of s participatio	es in chall ain ene ferent o variou bility - pment d challe mands energy Buildin bility - activit	enges for a change ergy demands of b climates <i>is forms of instru</i> design for climate enges for the build building standard g thermal energy design for climate	ding according to uction e change ding environment ds model	-		Number of hours Number of hours 15 1 1 2 2 3 6 Number of hours
W-1 Module/c C-1 C-2 Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-5 Student M A-P-1	Buildin COUTSE UT Knowle Skills o constru COUTENT d Design Sustair Climate Buildin Content Sankey Design WOTKloac Classes Project	nit objective edge of desig f defining ma juction for diff ivided into for sustaina nable develop e change and g energy der nporary low-o- v diagrams - for sustaina d - forms of s participatio	es in chall ain ene ferent of variou bility - pment d challe mands energy Buildin bility - activition	enges for a changergy demands of b climates <i>is forms of instru</i> design for climate enges for the build building standard g thermal energy design for climate	ding according to uction e change ding environment ds model	-		Number of hours 15 1 1 1 2 2 3 6 Number of hours 15
W-1 Module/c C-1 C-2 Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-6 Student t A-P-1 A-P-2	Buildin Course ur Knowle Skills o constru Content d Design Sustair Climate Buildin Conten Sankey Design workloac Classes Project Prepari	nit objective edge of desig f defining ma uction for diff ivided into for sustaina nable develop e change and g energy der nporary low- diagrams - for sustaina f - forms of s participatio work	es in chall ain ene ferent o variou bility - pment d challe mands energy Buildin bility - activition	enges for a changergy demands of b climates <i>is forms of instru</i> design for climate enges for the build building standard g thermal energy design for climate	ding according to uction e change ding environment ds model	-		Number of hours Number of hours 15 1 1 2 3 6 Number of hours 15 1 1 1 1 1 1 1 1 1 1 1 1 1 15 12
W-1 Module/c C-1 C-2 Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-6 Student t A-P-1 A-P-2 A-P-3	Buildin Course ur Skills o constru Design Sustair Climate Buildin Conten Sankey Design Workloac Classes Project Prepari	nit objective edge of desig f defining ma juction for diff ivided into for sustaina hable develop e change and g energy der nporary low- diagrams - for sustaina I - forms of s participatio work ing for project	es in chall ain ene ferent of variou bility - pment d challe mands energy Buildin bility - activition ct prese	enges for a changergy demands of b climates <i>is forms of instru</i> design for climate enges for the build building standard g thermal energy design for climate	ding according to uction e change ding environment ds model	-		Number of hours Number of hours 15 1 1 2 2 3 6 Number of hours 15 12 3 1 <tr< td=""></tr<>
W-1 Module/c C-1 C-2 Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 Student t A-P-1 A-P-2 A-P-3 A-W-1	Buildin Course ur Knowle Skills o constru Content d Design Sustair Climate Buildin Conten Sankey Design Workload Classes Project Prepari Classes Essays	nit objective edge of desig f defining ma juction for diff ivided into for sustaina nable develop e change and g energy der nporary low- diagrams - for sustaina I - forms of s participatio work ing for projects s participatio	es in chall ain ene ferent of variou bility - pment d challe mands energy Buildin bility - activition ct prese	enges for a changergy demands of b climates <i>is forms of instru</i> design for climate enges for the build building standard g thermal energy design for climate	ding according to uction e change ding environment ds model	-		Number of hours Number of hours 15 1 1 2 2 3 6 Number of hours 15 12 3 15 12 3 15 15 15 15 15 15 15 15 15
W-1 Module/c C-1 C-2 Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 Student v A-P-1 A-P-2 A-P-3 A-W-1 A-W-2 A-W-3 Teaching	Buildin COURSE UR Knowle Skills o constru Design Sustair Climate Buildin Conten Sankey Design WORKIOAC Classes Project Prepari Classes Essays Prepari	nit objective edge of desig f defining ma juction for diff ivided into for sustaina nable develop e change and g energy der nporary low- diagrams - for sustaina f - forms of s participatio work ing for project s participation preparation ation for pass	es in chall ain ene ferent of variou bility - pment d challe mands energy Buildin bility - activition ct prese	enges for a changergy demands of b climates <i>is forms of instru</i> design for climate enges for the build building standard g thermal energy design for climate	ding according to uction e change ding environment ds model	-		Number of hours 15 1 1 2 2 3 6 Number of hours 15 12 3 15 12 3 15 10
W-1 Module/c C-1 C-2 Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 Student t A-P-1 A-P-2 A-P-3 A-W-1 A-W-2 A-W-3 Teaching M-1	Buildin Course un Knowle Skills o constru Content d Design Sustair Climate Buildin Conten Sankey Design Workloac Classes Project Prepari Classes Prepari Classes Prepari Classes Class	nit objective edge of desig f defining ma juction for diff ivided into for sustaina nable develop e change and g energy der nporary low-o- r diagrams - for sustaina d - forms of s participatio work ing for project s participation preparation ation for pass ds / tools	es in chall ain ene ferent of variou bility - pment d challe mands energy Buildin bility - activition ct prese	enges for a changergy demands of b climates <i>is forms of instru</i> design for climate enges for the build building standard g thermal energy design for climate	ding according to uction e change ding environment ds model	-		Number of hours 15 1 1 2 2 3 6 Number of hours 15 12 3 15 12 3 15 10
W-1 Module/c C-1 C-2 Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 Student v A-P-1 A-P-2 A-P-3 A-W-1 A-W-2 A-W-3 Teaching M-1 M-2	Buildin COURSE UR Knowle Skills o constru Content d Design Sustair Climate Buildin Conten Sankey Design WORKIOAC Classes Project Prepari Classes Prepari Classes Prepari Classes Prepari Classes Prepari	nit objective edge of desig f defining ma juction for diff ivided into for sustaina nable develop e change and g energy der nporary low- r diagrams - for sustaina f - forms of s participatio work ing for project s participatio preparation ation for pass (s / tools work	es in chall ain ene ferent of variou bility - pment d challe mands energy Buildin bility - activition ct prese	enges for a changergy demands of b climates <i>is forms of instru</i> design for climate enges for the build building standard g thermal energy design for climate	ding according to uction e change ding environment ds model	-		Number of hours 15 1 1 2 2 3 6 Number of hours 15 12 3 15 10
W-1 Module/c C-1 C-2 Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 Student t A-P-1 A-P-2 A-P-3 A-W-1 A-W-2 A-W-3 Teaching M-1	Buildin Course un Knowle Skills o constru Content d Design Sustair Climate Buildin Conten Sankey Design Workloac Classes Project Prepari Classes Prepari Classes Prepari Classes Class	nit objective edge of desig f defining ma juction for diff ivided into for sustaina nable develop e change and g energy der nporary low- r diagrams - for sustaina f - forms of s participatio work ing for project s participatio preparation ation for pass (s / tools work	es in chall ain ene ferent of variou bility - pment d challe mands energy Buildin bility - activition ct prese	enges for a changergy demands of b climates <i>is forms of instru</i> design for climate enges for the build building standard g thermal energy design for climate	ding according to uction e change ding environment ds model	-		Number of hours 15 1 1 2 2 3 6 Number of hours 15 12 3 15 10
W-1 Module/c C-1 C-2 Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 Student f A-P-1 A-P-2 A-P-3 A-W-1 A-W-2 A-W-3 Teaching M-1 M-2 M-3	Buildin Course un Knowle Skills o constru Skills o Constru Content d Design Sustair Climate Buildin Conten Sankey Design Workload Classes Project Essays Prepari Classes Prepari Classes Essays Prepari Essays	nit objective edge of desig f defining ma juction for diff ivided into for sustaina nable develop e change and g energy der nporary low-o- r diagrams - for sustaina I - forms of s participatio work ing for project s participation preparation ation for pass s / tools work	es in chall ain ene ferent of variou bility - pment d challe mands energy Buildin bility - activit on ct prese on sing	enges for a changergy demands of b climates <i>is forms of instru</i> design for climate enges for the build building standard g thermal energy design for climate	ding according to uction e change ding environment ds model	-		Number of hours 15 1 1 2 2 3 6 Number of hours 15 12 3 15 12 3 15 10
W-1 Module/c C-1 C-2 Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 Student v A-P-1 A-P-2 A-P-3 A-P-3 A-W-1 A-W-2 A-W-3 Teaching M-1 M-2 M-3 Evaluatio S-1	Buildin Course un Knowle Skills o constru Skills o Constru Content d Design Sustair Climate Buildin Conten Sankey Design Workload Classes Project Essays Prepari Classes Prepari Classes Essays Prepari Essays	nit objective edge of desig f defining ma juction for diff ivided into for sustaina nable develop e change and g energy der nporary low-o- r diagrams - for sustaina I - forms of s participatio work ing for project s participation preparation ation for pass s / tools work	es in chall ain ene ferent of variou bility - pment d challe mands energy Buildin bility - activition ct prese on sing	enges for a change enges for a change rgy demands of b climates <i>is forms of instru</i> design for climate enges for the build building standard g thermal energy design for climate ty entation	ding according to uction e change ding environment ds model	-		Number of hours 15 1 1 2 2 3 6 Number of hours 15 12 3 15 12 3 15 12 3 15 10
W-1 Module/c C-1 C-2 Course c T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 Student v A-P-1 A-P-2 A-P-3 A-W-1 A-P-3 A-W-1 A-W-2 A-W-3 Teaching M-1 M-2 M-3 Evaluatio	Buildin Course ur Knowle Skills o constru Content d Design Sustair Climate Buildin Conten Buildin Conten Sankey Design Workloac Classes Project Prepari Classes Prepari Classes Prepari Classes Syse Prepari Classes C	nit objective edge of desig f defining ma juction for diff ivided into for sustaina hable develop e change and g energy der nporary low- r diagrams - for sustaina f - forms of s participatio work ing for project s participatio preparation ation for pass (s / tools work	es in chall ain ene ferent of variou bility - pment d challe mands energy Buildin bility - activity on ct prese on sing gressiv assesn	enges for a change enges for a change rgy demands of b climates <i>is forms of instru</i> design for climate enges for the build building standard g thermal energy design for climate ty entation	ding according to uction e change ding environment ds model	-		Number of hours 15 1 1 2 2 3 6 Number of hours 15 12 3 15 12 3 15 12 3 15 10

Designed learning outcomes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course content	Teaching methods	Evaluation methods		
Knowledge	•								
B-A_2A_ES/D/05-3_W01 Has advanced knowledge related to buildings sustainable design issues and developmental trends in moder low-energy buildings design	B-A_2A_W06 B-A_2A_W13	P7S_WG_TA21	P75_WG_IA21	C-1 C-2	T-P-1 T-W-4 T-W-1 T-W-5 T-W-2 T-W-6 T-W-3 T-W-6	M-1 M-2 M-3	S-1 S-2 S-3		
Skills	•	•							
B-A_2A_ES/D/05-3_U01 Skills to define energy demands of building for different climates and choosing building construction solutions in case of climate change	B-A_2A_U01 B-A_2A_U11	P7S_UK		C-2	T-P-1 T-W-4 T-W-1 T-W-5 T-W-2 T-W-6 T-W-3 T-W-8	M-1 M-2 M-3	S-1 S-2 S-3		
Other social / personal competences							-		
B-A_2A_ES/D/05-3_K01 Is able professionally define, classify and apply the priorities used for accomplishment of an undertaken engineering task	B-A_2A_K01	P7S_KK		C-1 C-2	T-P-1 T-W-4 T-W-1 T-W-5 T-W-2 T-W-6 T-W-3	M-1 M-2 M-3	S-1 S-2 S-3		
Required reading									
1. Edwards B., Rough Guide to Sustainability - 3rd Edition	n, RIBA Pablishin	g, London, 20	10						
2. Guzowski M., Towards Zero-energy Architecture - New	Solar Design, La	aurence King I	Publishing, Lo	ndon, 2	010				
3. Hegger M., Fuchs M., Stark T., Zeumer M., Energy Manual. Sustainable Architecture - Edition Detail, Birkhäuser, Basel, Boston, Berlin, 2008									
A Smith P.F. Architecture in a Climate of Change - A qui	do to sustainable	o docian - Soc	and adition F	Icovior	• Architoctural I	Dracc			

4. Smith P.F., Architecture in a Climate of Change - A guide to sustainable design - Second edition., Elsevier Architectural Press, Amsterdam - Boston - Heidelberg - London - New York - Oxford - Paris - San Diego - San Francisco - Singapore - Sydney - Tokyo, 2005

<u> </u>						_	
Field of stu	Jdy	Civil E	Engineering				
Mode of st	tudy	statio	nary	Level	second cycle		
Graduate's	s qualification	magis	ster	1		WBi/	Δ
Area(s) of	study	nauki	techniczne				·
Education	al profile	gener	ral academic				
Module	-	-					
Course un	it	Issue	es in Contempo	orary Building Ph	nysics		
Code		-	/S2CE/ES/D/07	, ,	•		
	ecialisation	-	eering Structure	25			
	ring faculty	-	-	li i Materiałów Buc	lowlanych		
ECTS		2,0		ECTS (forms)	2,0		
	ourse credit	credit		Language	english	-	
Electives				Elective group		-	
		Carla				Mainht	Credit
Form of in		Code	Semester	Hours	ECTS	Weight	Credit
laboratory	course	L	1	15	1,0	0,50	credits
lecture		W	1	15	1,0	0,50	credits
Leading te	eacher		-	Agata (Agata.Wyg			
Other tead	chers				zut.edu.pl), Stolarska ski Jarosław (Jarosla		@zut.edu.pl)
Prerequisi							
W-1	Building Materials,	Civil Er	ngineering				
Module/co	urse unit objectiv						
C-1	Understanding of the hygrothermal states the states of the			thermal and moistu	re behavior of building	constructions - S	Skills to evaluation of
Course co	ntent divided into	variou	s forms of instru	uction			Number of hours
T-L-1	Building air perme						2
T-L-2	Infrared thermogra						2
T-L-3	Measurements of Thermal comfort p	indoor c aramete	limate parameters ers - PMV/PPD met	s. thod			8
T-L-4				heat capacity of build	ding materials		2
T-L-5	Test						1
T-W-1	Thermal bridges ir moisture control o			ion of linear thermal	bridge coefficient - The	ermal and	7
T-W-2				ods - Regulation requ	lierments		2
T-W-3		aphy in	building diagnosti	cs - Fundamentals of	infrared thermal imag	ing - Thermal	4
T-W-4	Parameters of the	indoor r	microclimate				1
T-W-5	Final Test						1
Student w	orkload - forms o	f activit	ty				Number of hours
A-L-1	Participation in lab	oratory	classes				15
A-L-2	Analysis of results		orts preparation				5
A-L-3	Preparation for tes						10
A-W-1	Classes participati						15
A-W-2	Preparation for fin	al test					15
	methods / tools						
M-1	Lecture						
M-2	Workshop						
M-3	Laboratory						
	methods (F - pro	gressiv	/e, P - final)				
S-1	P Grade						
5-2	F Project wo	ĸ					

Evaluatio	on meth	ods (F - progressive, P - final)							
S-3	F	Continuous assesment							
S-4	F	Reports assesment							
	Desig	ned learning outcomes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course content	Teaching methods	Evaluation methods
Knowled	ge						•		
B-A_2A_ES/ Knowledge behavior of	in the filed	l of hygrothermal and air tightness uildings	B-A_2A_W02 B-A_2A_W06	P7S_WG_TA21	P7S_WG_IA21	C-1	T-W-1 T-W-3 T-W-2 T-W-4	M-1 M-2	S-1 S-3
Skills									
	per select	ion and practical application of modern ing physical phenomena in buildings	B-A_2A_U01	P7S_UK		C-1	T-L-1 T-W-1 T-L-2 T-W-2 T-L-3 T-W-3 T-L-4 T-W-4	M-1 M-2 M-3	S-1 S-2 S-3 S-4
Other so	cial / pe	rsonal competences							
B-A_2A_ES/ Responsibil calculations	lity for relia	bility of the obtained measurements and	B-A_2A_K02	P7S_KK		C-1	T-L-1 T-L-4 T-L-2 T-W-1 T-L-3	M-2 M-3	S-2 S-3 S-4
Required	d reading	9							
1. Hegger 2008	r M., Fuch	s M., Stark T. Zeumer M., Energy Mar	ual - Sustainable	e Architecture	- Edition Deta	il, Birkh	äuser, Basel, E	Boston, I	3erlin,
2. Incoper Hoboken,		eWitt D.P., Bergman T.L., Lavine A.S.,	Fundamentals of	f Heat and Ma	ss Transfer - S	Sixth Ed	ition, John Wile	ey & Sor	IS,
3. McMulla	an R., En	vironmental Science in Building - Fifth	edition, Palgrav	e MacMillan, N	lew York, 200	6			
		l building physics. Boundary conditior	, 51						
		mann K. P., Infrared Thermal Imaging 2018, 2nd Edition	: Fundamentals,	Research and	Applications,	Wiley V	'CH Verlag Gm	bH & Co	
6. EN ISO,	, EN, ISO	Standards							

Field of stu	Jdy	Civil E	Ingineering				
Mode of st	-	statio		Level	second cycle	-	
Graduate's	s qualification	magis	ster	1	-	WBi/	7
Area(s) of	study	nauki	techniczne				`
Educationa	al profile	gener	al academic				
Module	-					1	
Course uni	it	Earth	en Structures	;			
Code		WBIA	/S2CE/ES/D/10			1	
Field of sp	ecialisation	Engin	eering Structure	es			
Administer	ring faculty	Kated	lra Geotechniki				
ECTS		2,0		ECTS (forms)	2,0	-	
Form of co	ourse credit	credit	S	Language	english	1	
Electives				Elective group		-	
Form of ins	struction	Code	Semester	Hours	ECTS	Weight	Credit
project cou		Р	2	15	1,0	0,50	credits
lecture		w	2	15	1,0	0,50	credits
Leading te	eacher	Szme		Grzegorz.Szmeche		-,	
Other teac		Szme		Grzegorz.Szmeche	l@zut.edu.pl), Żarkie	wicz Krzysztof	
Prerequisit	tes						
, W-1	Basic of soil mech	anics					
Module/co	urse unit objecti	ves					
C-1	-		ith complex probl	ems of designing of t	he earth structures		
Course cor	ntent divided int	o variou	s forms of instru	uction			Number of hours
T-P-1	Design exercises	from ear	th structures: des	igning earth embank	ment dimensions found	led on the weak	15
T-W-1	soils, filtration cal Soil properties in soil parameters.				e compaction process	on changes in	2
T-W-2		n constru	ction facilities on	a substrate of weak	and organic soils		2
T-W-3			-	ents and unstable slo	•		2
T-W-4				ffecting the selectior in the body and gro	of the damm location.	Drainage in	2
T-W-5	Sealing barrier in	to the bo	dy and base of th	ne embankment - cor	es, screens (plastic and		3
T-W-6	Slope stability cal			s (performed under t	the cover of a thixotrop	ic suspension)	2
T-W-7		ction met	thods, and quality	testing of soil embe	dded in the embankme	nt (during the	2
Student w	orkload - forms o	of activit	<i>y</i>				Number of hours
A-P-1	Presence at the c	lass					15
A-P-2	Design project of	earhen s	tructure founded	on weak soil			15
A-W-1	Presence at class						15
A-W-2	Own work with lit						5
A-W-3 A-W-4	Powerpoint prese Preparation for fir			l by student			5
	•	iai test e	XdIII				5
	methods / tools						
M-1 M-2	Lectures method Project Desing me	thod					
Evaluation S-1	<i>methods (F - pr</i>	-	ve, P - final) of student progres				
5-1 5-2	P Test exam		or student progres				
		. i a cinig					

Designed learning outcomes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course content	Teaching methods	Evaluation methods
Knowledge	·						
CE_2A_ES/D/07_W01 He has knowledge about design the foundation of the embankment in complex geotechnical conditions	B-A_2A_W02 B-A_2A_W03 B-A_2A_W04 B-A_2A_W08	P75_WG_TA21	P7S_WG_IA21	C-1	T-P-1 T-W-4 T-W-1 T-W-5 T-W-2 T-W-6 T-W-3 T-W-7	M-1 M-2	S-1 S-2
Skills							
B-A_2A_ES/D/07_U01 He can design the foundation of the embankment in complex geotechnical conditions	B-A_2A_U11 B-A_2A_U21 B-A_2A_U22	P7S_UK P7S_UW_TA24		C-1	T-P-1 T-W-4 T-W-1 T-W-5 T-W-2 T-W-6 T-W-3 T-W-7	M-2	S-1
Other social / personal competences	•						-
B-A_2A_ES/D/07_K01 He can work with a group to achieve the desired engeneering effect.	B-A_2A_K02 B-A_2A_K08	P7S_KK P7S_KO		C-1	T-P-1 T-W-4 T-W-1 T-W-5 T-W-2 T-W-6 T-W-3 T-W-7	M-1 M-2	S-1
Required reading 1. L. Vanicek, M Vanicek, Earth Structures: In Transport, 9781402039638	Water and Envir	onmental Eng	ineering, Spri	nger- Ve	erlag, 2007, ISE	BN-13:	

Field of							
Field of s	study	Civil E	ngineering				
Mode of	study	statio	nary	Level	second cycle		
Graduat	e's qualification	magis	ter			WBi/	7
Area(s) (of study	nauki	techniczne				`
Educatio	onal profile	gener	al academic				
Module							
Course ι	unit	Struc	tural Reliabili	ity Theory			
Code		WBIA/	S2CE/ES/D/11				
Field of s	specialisation	Engine	eering Structure	es			
Administ	tering faculty	Zakład	d Teorii Konstru	ıkcji			
ECTS		2,0		ECTS (forms)	2,0		
Form of	course credit	credit	S	Language	english		
Electives	s			Elective group			
Form of	instruction	Code	Semester	Hours	ECTS	Weight	Credit
project c	course	Р	2	15	1,0	0,50	credits
lecture		w	2	30	1,0	0,50	credits
Leading	teacher	Iwank	iewicz Radosłav	⊥ w (riwankiewicz@:	zut.edu.pl)		1
Other te				cka@zut.edu.pl)			
Prerequi				_ 1'			
W-1		ses pert	inent to BSc in E	ngineering degree	course.		
W-2	Structural Mechani	cs.					
	Structural Mechani						
	<i>course unit objectiv</i>	es	ods of probability	y theory, in particula	r the methods of rando	om variables in pro	oblems of structural
Module/d C-1	<i>course unit objectiv</i> Capability to use th reliability.	<i>es</i> ne meth			r the methods of rando ear failure (safety marg		
Module/o C-1 C-2	Course unit objective Capability to use th reliability. Capability to formu basic variables.	es ne methe Ilate and	d solve the reliab	ility problem for line	ear failure (safety marc	gin, or limit state)	function and normal
Module/d C-1	Course unit objective Capability to use th reliability. Capability to formu basic variables.	es ne meth- ilate and	d solve the reliab	ility problem for line		gin, or limit state)	function and normal
Module/d C-1 C-2 C-3	Course unit objective Capability to use the reliability. Capability to formu- basic variables. Capability to formu- normal basic varial content divided into	es ne meth ilate and ilate and bles. various	d solve the reliab d solve the reliab s forms of instru	ility problem for line ility problem for non uction	ear failure (safety marg -linear failure (safety r	gin, or limit state) nargin, or limit sta	function and normal
Module/d C-1 C-2 C-3	Course unit objective Capability to use the reliability. Capability to formu- basic variables. Capability to formu- normal basic varial content divided into Example problems	es ne meth ilate and bles. various : determ	d solve the reliab d solve the reliab s forms of instru- nination of proba	ility problem for line ility problem for non uction ibility of failure and s	ear failure (safety marc	gin, or limit state) nargin, or limit sta	function and normal te) function and
Module/o C-1 C-2 C-3 Course c	Course unit objective Capability to use the reliability. Capability to formu- basic variables. Capability to formu- normal basic varial content divided into Example problems elements and their Example problems and statistical more	es ne meth- ilate and bles. <i>various</i> : determ : determ nents of	d solve the reliab d solve the reliab s forms of instru- nination of proba ations (in series, nination of proba some discrete ra	ility problem for line ility problem for non uction ibility of failure and s in parallel, etc.) ibility distribution fur andom variables.	ear failure (safety marg -linear failure (safety r survival (reliability) of s nction, cumulative dist	gin, or limit state) nargin, or limit sta single structural ribution function	function and normal te) function and Number of hours
Module/c C-1 C-2 C-3 Course c T-P-1	course unit objective Capability to use the reliability. Capability to formu- basic variables. Capability to formu- normal basic varial content divided into Example problems elements and their Example problems and statistical mon- Example problems	es ne meth- ilate and bles. various determ combin determ nents of determ	d solve the reliab d solve the reliab s forms of instru- nination of proba ations (in series, nination of proba some discrete ra nination of proba	ility problem for line ility problem for non uction ability of failure and s in parallel, etc.) ability distribution fur andom variables. ability density, cumu	ear failure (safety marg -linear failure (safety r survival (reliability) of s	gin, or limit state) nargin, or limit sta single structural ribution function	function and normal te) function and Number of hours 3
Module/a C-1 C-2 C-3 Course c T-P-1 T-P-2 T-P-3	course unit objective Capability to use the reliability. Capability to formu- basic variables. Capability to formu- normal basic varial content divided into Example problems and statistical moment Example problems statistical moment Example problems	es ne metho ilate and bles. various : determ : determ nents of : determ s of som : determ	d solve the reliab d solve the reliab s forms of instru- nination of proba ations (in series, nination of proba some discrete ra nination of proba e continuous ran	ility problem for line ility problem for non uction ibility of failure and s in parallel, etc.) ibility distribution fur andom variables. ibility density, cumu indom variables.	ear failure (safety marg -linear failure (safety r survival (reliability) of s nction, cumulative dist	gin, or limit state) margin, or limit sta single structural ribution function tion and	function and normal te) function and Number of hours 3 4 4
Module/a C-1 C-2 C-3 Course c T-P-1 T-P-2 T-P-3 T-P-4	course unit objective Capability to use the reliability. Capability to formu- basic variables. Capability to formu- normal basic varial content divided into Example problems and statistical moment Example problems statistical moment Example problems statistical moment Example problems statistical moment Example problems	es ne metho ilate and bles. various determ combin determ nents of determ s of som determ aid of C	d solve the reliab d solve the reliab s forms of instru- nination of proba ations (in series, nination of proba some discrete ra- nination of proba e continuous ran nination of approx- ornell method.	ility problem for line ility problem for non uction ibility of failure and s in parallel, etc.) ibility distribution fur andom variables. ibility density, cumu indom variables. ibility density, cumu indom variables.	ear failure (safety marg -linear failure (safety r survival (reliability) of s nction, cumulative dist lative distribution funct ex for non-linear safety	gin, or limit state) margin, or limit sta single structural ribution function tion and y margin	function and normal te) function and Number of hours 3 4 4 2
Module/a C-1 C-2 C-3 Course a T-P-1 T-P-2 T-P-3 T-P-4 T-P-5	course unit objective Capability to use the reliability. Capability to formu- basic variables. Capability to formu- normal basic varial content divided into Example problems elements and their Example problems and statistical moment Example problems statistical moment Example problems functions with the Example problems functions with the Example problems with the aid of Has	es ne metho ilate and bles. various : determ combin : determ nents of : determ aid of C : iterativ ofer-Ling	d solve the reliab d solve the reliab s forms of instru- nination of proba ations (in series, nination of proba some discrete ra nination of proba the continuous ran nination of approx ornell method. re determination d method.	ility problem for line ility problem for non uction ibility of failure and s in parallel, etc.) ibility distribution fur andom variables. ibility density, cumu idom variables. ximate reliability index for	ear failure (safety marg -linear failure (safety r survival (reliability) of s nction, cumulative dist lative distribution func ex for non-linear safety ma	gin, or limit state) margin, or limit sta single structural ribution function tion and y margin	function and normal te) function and Number of hours 3 4 4 2 2 2
Module/a C-1 C-2 C-3 Course c T-P-1 T-P-2 T-P-3 T-P-4 T-P-5 T-W-1	Course unit objective Capability to use the reliability. Capability to formu- basic variables. Capability to formu- normal basic varial content divided into Example problems elements and their Example problems and statistical moment Example problems statistical moment Example problems functions with the Example problems with the aid of Has Uncertainties in Sta	es ne metho ilate and bles. various : determ combin : determ s of som : determ aid of C : iterativ ofer-Line ructural	d solve the reliab d solve the reliab d solve the reliab s forms of instru- nination of proba some discrete ra nination of proba some discrete ra nination of proba the continuous ran nination of approx fornell method. re determination d method. Engineering. Eve	ility problem for line ility problem for non uction ibility of failure and s in parallel, etc.) ibility distribution fur andom variables. ibility density, cumu idom variables. ximate reliability index for of reliability index for	ear failure (safety marg -linear failure (safety r survival (reliability) of s nction, cumulative dist lative distribution funct ex for non-linear safety ma pr non-linear safety ma	gin, or limit state) nargin, or limit sta single structural ribution function tion and y margin argin functions	function and normal te) function and Number of hours 3 4 4 2
Module/a C-1 C-2 C-3 Course a T-P-1 T-P-2 T-P-3 T-P-4 T-P-5	Course unit objective Capability to use th reliability. Capability to formu basic variables. Capability to formu normal basic varial Content divided into Example problems and statistical moment Example problems statistical moment Example problems functions with the Example problems with the aid of Has Uncertainties in Sta	es ne metho ilate and bles. various : determ combin : determ aid of C : iterativ ofer-Line ructural (revision re and su	d solve the reliab d solve the reliab d solve the reliab s forms of instru- nination of proba ations (in series, nination of proba some discrete ra nination of proba e continuous ran nination of approx ornell method. re determination d method. Engineering. Eve n). Sample space urvival (reliability	ility problem for line ility problem for non uction ibility of failure and s in parallel, etc.) ibility distribution fur andom variables. ibility density, cumu idom variables. ximate reliability index of reliability index for ents of failure and su and events. Axioms of single structura	ear failure (safety marg -linear failure (safety r survival (reliability) of s nction, cumulative dist lative distribution func- ex for non-linear safety ma pr non-linear safety ma irvival. and theorems of proba l elements and their co	gin, or limit state) nargin, or limit sta single structural ribution function tion and y margin argin functions ability theory.	function and normal te) function and Number of hours 3 4 4 2 2 2
Module/a C-1 C-2 C-3 Course c T-P-1 T-P-2 T-P-3 T-P-4 T-P-5 T-W-1	Course unit objective Capability to use th reliability. Capability to formu basic variables. Capability to formu normal basic varial Content divided into Example problems elements and their Example problems and statistical moment Example problems functions with the Example problems with the aid of Has Uncertainties in Stri Probability theory of Probability theory of Random variables: function, statistical e.g. Gaussian (normitical)	es ne metho ilate and bles. various : determ combin : determ aid of C : iterativ ofer-Line ructural (revision re and su discrete I momer	d solve the reliab d solve the reliab d solve the reliab s forms of instru- nination of proba ations (in series, nination of proba some discrete ra- nination of proba e continuous ran nination of approx- ornell method. re determination d method. Engineering. Eve D. Sample space urvival (reliability e and continuous nts. Transformatic	ility problem for line ility problem for non uction ibility of failure and s in parallel, etc.) ibility distribution fur andom variables. ibility density, cumu idom variables. ximate reliability index for ents of failure and su and events. Axioms () of single structural probability distribut on of random variab	ear failure (safety marg -linear failure (safety r survival (reliability) of s nction, cumulative dist lative distribution func- ex for non-linear safety ma pr non-linear safety ma and theorems of proba	gin, or limit state) nargin, or limit sta single structural ribution function tion and y margin argin functions ability theory. ombinations. ution and density ty distributions,	function and normal te) function and Number of hours 3 4 4 2 2 2 2
Module/a C-1 C-2 C-3 Course c T-P-1 T-P-2 T-P-3 T-P-3 T-P-4 T-P-5 T-W-1 T-W-2	course unit objective Capability to use the reliability. Capability to formulasic variables. Content divided into Example problems and statistical moment Example problems statistical moment Example problems functions with the Example problems functions with the Example problems with the aid of Has Uncertainties in Str Probability theory of tailur Random variables: function, statistical e.g. Gaussian (norr III (Weibull). Safety margin and basic variables.	es ne methe ilate and bles. <i>various</i> : determ combin : determ aid of C : iterativ ofer-Lind ructural (revision re and su discrete I momer mal), log	d solve the reliab d solve the reliab d solve the reliab s forms of instru- nination of proba some discrete ra some discrete ra some discrete ra nination of proba d some discrete ra some discrete ra some discrete ra some discreter ra some discret	ility problem for line ility problem for non uction ibility of failure and s in parallel, etc.) ibility distribution fur andom variables. ibility density, cumu adom variables. ximate reliability index for of reliability index for ents of failure and su and events. Axioms of of single structural probability distribut on of random variab e value distributions r failure (safety mar	ear failure (safety marge -linear failure (safety r survival (reliability) of s nction, cumulative dist lative distribution funct ex for non-linear safety or non-linear safety ma rvival. and theorems of proba l elements and their co ion, cumulative distrib les. Example probabilit type I (Gumbel), type I gin, or limit state) funct	gin, or limit state) nargin, or limit state single structural ribution function tion and y margin argin functions ability theory. ombinations. ution and density ty distributions, I (Frechet), type tion and normal	function and normal te) function and Number of hours 3 4 4 2 2 2 2 2 4
Module/a C-1 C-2 C-3 Course c T-P-1 T-P-2 T-P-3 T-P-4 T-P-5 T-W-1 T-W-2 T-W-2 T-W-3	course unit objective Capability to use the reliability. Capability to formula basic variables. Content divided into Example problems elements and their Example problems and statistical moment Example problems statistical moment Example problems functions with the Example problems functions with the Example problems functions with the Example problems function, statistical Probability of failur Random variables: function, statistical e.g. Gaussian (norri III (Weibull). Safety margin and basic variables. Non-linear safety m (Taylor series expa Approximate reliable	es he methe ilate and bles. various : determ : determ : determ : determ aid of C : determ aid of C : iterativ ofer-Lind (revision ructural (revision e and su discrete I momer mal), log reliabilit nargin (f ansion) a bility inde	d solve the reliab d solve the reliab d solve the reliab s forms of instru- nination of proba some discrete ra- nination of proba some discrete ra- nination of proba de continuous ran- nination of approx- ornell method. Engineering. Even uvival (reliability e and continuous nots. Transformation promal, extreme ty index for linear failure or limit sta- about the mean p ex .	ility problem for line ility problem for non uction ability of failure and s in parallel, etc.) ability distribution fur andom variables. ability density, cumu hdom variables. ximate reliability index for ents of failure and su and events. Axioms of reliability index for ents of failure and su and events. Axioms of single structural probability distributi on of random variab e value distributions r failure (safety mar- ate) function and non point (about the expen-	ear failure (safety marger- linear failure (safety r survival (reliability) of s nction, cumulative dist lative distribution function ex for non-linear safety or non-linear safety ma rvival. and theorems of proba- l elements and their co- ion, cumulative distrib- les. Example probabilit type I (Gumbel), type I gin, or limit state) function rmal basic variables. Li- ected values) - Cornell	gin, or limit state) nargin, or limit states single structural ribution function tion and y margin argin functions ability theory. ombinations. ution and density ty distributions, I (Frechet), type tion and normal nearization method.	function and normal te) function and Number of hours 3 4 4 2 2 2 2 2 4 8
Module/a C-1 C-2 C-3 Course c T-P-1 T-P-2 T-P-3 T-P-3 T-P-4 T-P-5 T-W-1 T-W-2 T-W-2 T-W-2	course unit objective Capability to use the reliability. Capability to formula basic variables. Content divided into Example problems elements and their Example problems and statistical moment Example problems statistical moment Example problems functions with the Example problems functions with the Example problems functions with the Example problems function, statistical Probability theory of Probability of failur Random variables: function, statistical e.g. Gaussian (norri III (Weibull). Safety margin and basic variables. Non-linear safety m (Taylor series expaction safety m Approximate reliab	es he methe llate and bles. various : determ : determ : determ : determ aid of C : determ aid of C : iterativ ofer-Lind (revision e and su discrete I momer mal), log reliabilit nargin (f ansion) a bility inde	d solve the reliab d solve the reliab d solve the reliab s forms of instru- nination of proba some discrete ra- nination of proba some discrete ra- nination of proba te continuous ran- nination of approx- ornell method. Engineering. Even uvival (reliability e and continuous normal, extreme ty index for linear failure or limit sta- about the mean p ex. failure or limit sta-	ility problem for line ility problem for non uction ability of failure and s in parallel, etc.) ability distribution fur andom variables. ability density, cumu hdom variables. ximate reliability index for ents of failure and su and events. Axioms () of single structural probability distributions e value distributions r failure (safety mar- ate) function and non boint (about the expe- ate) function and non	ear failure (safety marg -linear failure (safety r survival (reliability) of s nction, cumulative dist lative distribution funct ex for non-linear safety or non-linear safety ma rvival. and theorems of proba l elements and their co ion, cumulative distrib les. Example probabilit type I (Gumbel), type I gin, or limit state) funct mal basic variables. Li ected values) - Cornell mal basic variables. Li	gin, or limit state) nargin, or limit states single structural ribution function tion and y margin argin functions ability theory. ombinations. ution and density ty distributions, I (Frechet), type tion and normal nearization method.	function and normal te) function and Number of hours 3 4 4 2 2 2 2 2 4 8 8
Module/a C-1 C-2 C-3 Course c T-P-1 T-P-2 T-P-3 T-P-3 T-P-4 T-P-5 T-W-1 T-W-2 T-W-2 T-W-2 T-W-2	course unit objective Capability to use the reliability. Capability to formula basic variables. Content divided into Example problems elements and their Example problems and statistical moment Example problems functions with the Example problems functions with the Example problems functions with the Example problems function, statistical Oncertainties in Str Probability theory of probability of failur Random variables: function, statistical e.g. Gaussian (norr III (Weibull). Safety margin and basic variables. Non-linear safety m (Taylor series expation and basic variables. Non-linear safety m (Taylor series expation and basic variables. Non-linear safety m Non-linear safety m (Taylor series expation and basic variables.	es he methe llate and bles. various : determ : determ aid of C : determ aid of C : iterativ ofer-Lind (revision re and su discrete l momer mal), log reliabilit nargin (f ansion) a pility indo	d solve the reliab d solve the reliab d solve the reliab s forms of instru- nination of proba- some discrete ra- nination of proba some discrete ra- nination of proba- ne continuous ran- nination of approx- ornell method. Engineering. Eve uvival (reliability e and continuous normal, extreme ty index for linear failure or limit sta- bout the mean p ex. failure or limit sta- bout the design and reliability vs.	ility problem for line ility problem for non uction ability of failure and s in parallel, etc.) ability distribution fur andom variables. ability density, cumu hdom variables. ximate reliability index for ents of failure and su and events. Axioms of reliability index for ents of failure and su and events. Axioms of single structural probability distributions r failure (safety mar- ate) function and non point (about the expe- ate) function and non point – Hasofer-Lind	ear failure (safety marg -linear failure (safety r survival (reliability) of s nction, cumulative dist lative distribution funct ex for non-linear safety or non-linear safety ma rvival. and theorems of proba l elements and their co ion, cumulative distrib les. Example probabilit type I (Gumbel), type I gin, or limit state) funct mal basic variables. Li method. tribution of time to fail	gin, or limit state) nargin, or limit states single structural ribution function tion and y margin argin functions ability theory. ombinations. ution and density ty distributions, I (Frechet), type tion and normal nearization method.	function and normal te) function and Number of hours 3 4 4 2 2 2 2 2 2 4 8 8 4 4
Module/a C-1 C-2 C-3 Course c T-P-1 T-P-2 T-P-3 T-P-4 T-P-5 T-W-1 T-W-2 T-W-2 T-W-2 T-W-2 T-W-5 T-W-6 T-W-7	course unit objective Capability to use the reliability. Capability to formula basic variables. Content divided into Example problems elements and their Example problems and statistical moment Example problems functions with the Example problems functions with the Example problems functions with the Example problems function, statistical Oncertainties in Str Probability theory of probability of failur Random variables: function, statistical e.g. Gaussian (norr III (Weibull). Safety margin and basic variables. Non-linear safety m (Taylor series expation and basic variables. Non-linear safety m (Taylor series expation and basic variables. Non-linear safety m Non-linear safety m (Taylor series expation and basic variables.	es he metho ilate and bles. various : determ combin : determ aid of C : determ aid of C : iterativ ofer-Line ructural (revision e and su discrete I momer mal), log reliabilit nargin (f ansion) a polity indo nargin (f ansion) a failure (d solve the reliab d solve the reliab d solve the reliab s forms of instru- nination of proba ations (in series, nination of proba some discrete ra nination of proba some discrete ra nination of proba de continuous ran nination of approx ornell method. re determination d method. Engineering. Eve uvival (reliability e and continuous nts. Transformation normal, extreme ty index for linear about the mean p ex . failure or limit stat bout the design ind reliability vs. (breakdown rate)	ility problem for line ility problem for non uction ability of failure and s in parallel, etc.) ability distribution fur andom variables. ability density, cumu hdom variables. ximate reliability ind of reliability index for ents of failure and su and events. Axioms of single structural probability distribut on of random variab e value distributions r failure (safety mar ate) function and non point (about the expec- ate) function and non point – Hasofer-Lind time: probability dist	ear failure (safety marg -linear failure (safety r survival (reliability) of s nction, cumulative dist lative distribution funct ex for non-linear safety or non-linear safety ma rvival. and theorems of proba l elements and their co ion, cumulative distrib les. Example probabilit type I (Gumbel), type I gin, or limit state) funct mal basic variables. Li method. tribution of time to fail	gin, or limit state) nargin, or limit states single structural ribution function tion and y margin argin functions ability theory. ombinations. ution and density ty distributions, I (Frechet), type tion and normal nearization method.	function and normal te) function and Number of hours 3 4 4 4 2 2 2 2 2 2 4 8 8 4 4 4 4 4
Module/a C-1 C-2 C-3 Course c T-P-1 T-P-2 T-P-3 T-P-4 T-P-5 T-W-1 T-W-2 T-W-2 T-W-2 T-W-2 T-W-5 T-W-6 T-W-7	course unit objective Capability to use the reliability. Capability to formula basic variables. Content divided into Example problems elements and their Example problems and statistical moment Example problems functions with the Example problems functions with the Example problems with the aid of Has Uncertainties in Str Probability theory Probability of failur Random variables: function, statistical e.g. Gaussian (norr III (Weibull). Safety margin and basic variables. Non-linear safety m (Taylor series expacted) Non-linear safety m (Taylor series expacted) Poisson counting p Differtime, expected)	es he methe ilate and bles. <i>various</i> : determ : determ aid of C : determ aid of C : iterativ ofer-Lind ructural (revision ce and su discrete I momer mal), log reliabilit nargin (f ansion) a pility indo nargin (f ansion) a failure (f <i>cactivit</i>)	d solve the reliab d solve the reliab d solve the reliab s forms of instru- nination of proba- some discrete ra- nination of proba some discrete ra- nination of proba e continuous ran- nination of approx- ornell method. Engineering. Even to and continuous and continuous the continuous and continuous ty index for linear failure or limit sta- bout the mean p ex . failure or limit sta- bout the design and reliability vs. (breakdown rate)	ility problem for line ility problem for non uction ability of failure and s in parallel, etc.) ability distribution fur andom variables. ability density, cumu hdom variables. ximate reliability ind of reliability index for ents of failure and su and events. Axioms of single structural probability distribut on of random variab e value distributions r failure (safety mar ate) function and non point (about the expec- ate) function and non point – Hasofer-Lind time: probability dist	ear failure (safety marg -linear failure (safety r survival (reliability) of s nction, cumulative dist lative distribution funct ex for non-linear safety or non-linear safety ma rvival. and theorems of proba l elements and their co ion, cumulative distrib les. Example probabilit type I (Gumbel), type I gin, or limit state) funct mal basic variables. Li method. tribution of time to fail	gin, or limit state) nargin, or limit states single structural ribution function tion and y margin argin functions ability theory. ombinations. ution and density ty distributions, I (Frechet), type tion and normal nearization method.	function and normal te) function and Number of hours 3 4 4 2 2 2 2 2 2 4 8 8 4 4 4 4 4 4

Student v	vorkload	l - forms of activity						Nun	nber of	hours
A-P-3	Home a	assignments (two major assignments)).							5
A-P-4	Studyir	ng/revision for the final test.								5
4-W-1	Attend	ing the lectures.								30
Teaching	methoa	ls / tools								
M-1	Lecture	25.								
M-2	Solving	problems and home assignments.								
Evaluatio	n metho	ods (F - progressive, P - final)								
S-1	F	Final test mark.								
S - 2	F	Assessment of home assignments.								
	Desigr	ned learning outcomes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Cours	e content	Teaching methods	Evaluation methods
Knowledg	ge		•	•						
	uld be able	e to develop simple mathematical models al reliability.	B-A_2A_W01	P7S_WG_TA21	P75_WG_IA21	C-1 C-2 C-3	T-P-1 T-P-2 T-P-3 T-P-4 T-P-5 T-W-1	T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 T-W-7	M-1 M-2	S-1 S-2
Skills				•						
	uld be able	e to solve numerically the equations reliability problems.	B-A_2A_U01	P7S_UK		C-1 C-2 C-3	T-P-1 T-P-2 T-P-3 T-P-4 T-P-5 T-W-1	T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 T-W-7	M-1 M-2	S-1 S-2
Other soc	cial / per	sonal competences								
	ws the cap	pability to make a plan for an undertaken al project, to execute it and to observe	B-A_2A_K01	P7S_KK		C-1 C-2 C-3	T-P-1 T-P-2 T-P-3 T-P-4 T-P-5 T-W-1	T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 T-W-7	M-1 M-2	S-1 S-2
Required	reading									
1. Robert I	E. Melche	rs, Structural Reliability Analysis and	Prediction, John	Wiley and Sor	ıs, 1999					
2. P. Thoft	-Christen	sen and Y. Murotsu, Application of Str	uctural Systems	Reliability Th	eory, Springer	r, Berlin	, 1986			

Field of st	udy		Civil I	Engineering								
Mode of s	tudy		statio	nary	Level	second	cycle					
Graduate'	s quali	fication	magi	ster				M	VBiA			
Area(s) of	study		nauki	i techniczne				v		`		
Education		le	gene	ral academic				1 Г		٦C		
Module									- 11			
Course un	nit		Com	plex Concrete	Structures II				- 11		臣	
Code				/S2CE/ES/D/12					- 11	Ш	ШП	
Field of sp	ocialis	ation		eering Structure				1	- 11	Ш		
Administe				dra Konstrukcji Ż		ochnologii P	otopu			Ц.	L	
ECTS	iniy ia	Luity	4,0		ECTS (forms)	4,0	etonu	-				
								_				
Form of co	ourse c	redit	exam	nination	Language	english		_				
Electives					Elective group)						
Form of in	structi	on	Code	Semester	Hours		ECTS	We	eight		Credi	t
project co	urse		Р	2	30		2,0	0,	,50		credit	s
lecture			W	2	30		2,0	0,	,50	ex	amina	tion
Leading te	eacher		Kiern	ożycki Włodzimi	erz (Wlodzimie	rz.Kiernozyc	ki@zut.edu.	pl)				
Other tea			Brzoz	zowski Piotr (Piot Iski Adam (Adam	r.Brzozowski@	zut.edu.pl),	-		/isiting@	zut.e	edu.pl)	,
Prerequisi	ites		1			•						
W-1		l Complex Co	oncrete	Structures course	5							
Module/co	urse u	nit objective	<u>م</u>									
C-1		-		engineering struct	tures							
C-2	-		•	grams, complex lo		olication of un	usual method	ls of stru	icture and	alysis		
Course co	ntent o	livided into	variou	is forms of instru	uction					Num	ber of	hours
T-P-1	Individ	ual design of	f a sele	ected type of struct	ture: tank, shell s	structure, load	specification	, static		- Turin		30
				g of elements, stru								
T-W-1				afety and durabilit diagrams and des	-	nes shell stru	ctures plates	tanks				2
T-W-2	bunke	rs, silo										24
T-W-3		ural integrity inforcement		ilure of reinforced ctures	concrete structu	res: cracking,	deflection, co	orrosion,	safety			4
Student w	orkload	d - forms of	activi	ty						Num	ber of	hours
A-P-1	Partici	pation in clas	sses									30
A-P-2				design assignment	:							20
A-P-3		pation in con		ons								4
A-P-4		ation for gra	-									5
A-P-5		lled Assessm										1
A-W-1		pation in clas										30
A-W-2 A-W-3		e preparation		ature study								23
A-W-3 A-W-4		ation for the an exam	exalli									4
Teaching												
M-1	Lectur											
М-2	Project	t										
Evaluatio	n metho	ods (F - prod	gressiv	ve, P - final)								
S-1	Р	Written exa	-									
5-2	Р	Coursework	assess	sment								
	1	<u> </u>			Reference to the	Reference to the learning outcomes	Reference to					

Knowledge								
B-A_2A_ES/D/09_W01 Knows and understands: identification of static diagrams and loads in complex concrete structures, rules for designing spatial structures, durability and structural safety issues	B-A_2A_W05 B-A_2A_W06 B-A_2A_W08 B-A_2A_W10	P7S_WG_TA21	P75_WG_IA21	C-1 C-2	T-W-1 T-W-2	T-W-3	M-1	S-1 S-2
Skills								
B-A_2A_ES/D/09_U01 Can design complex concrete structures and prepares design drawings	B-A_2A_U08 B-A_2A_U15 B-A_2A_U17 B-A_2A_U21	P7S_UW_TA24	P7S_UW_IA24	C-1 C-2	T-P-1 T-W-1	T-W-2 T-W-3	M-2	S-2
Other social / personal competences								
B-A_2A_ES/D/09_K01 Student presents unclear data, unfinished solutions, follows the work ethics	B-A_2A_K01 B-A_2A_K05 B-A_2A_K06	P7S_KK P7S_KO P7S_KR		C-1 C-2	T-P-1 T-W-1	T-W-2 T-W-3	M-1 M-2	S-1 S-2
Required reading								
1. Giandomenico Toniolo, Marco di Prisco, Michele Win Ta	ai Mak, Reinforc	ed Concrete D	esign to Euroc	ode 2,	Spring	er Verlag	g GmbH	, 2017
2. W. H. Mosley, Reinforced Concrete Design, PALGRAVE	MACMILLAN, 20)12						
3. Millais, Malcolm, Building structures : from concepts to	design, Spon P	Press, New York	<, 2005					
4. MacGregor, James Grierson, Reinforced concrete : mec	hanics and des	ign, Pearson P	rentice Hall, 2	006				
5. A. M. Neville, Properties of concrete, London, 2011								
6. Starosolski W., Konstrukcje żelbetowe, według EC2 t. I-	V, PWN, Warsz	awa, 2011						
7. EN 1992-1-1, Eurocode2 :Design of concrete structures	s - Part 1-1:Gen	eral rules and	rules for build	ings, 2	010			
8. EN 1992-3, Eurocode 2 - Design of conrete structures -	Part 3: Liquid r	retainig and co	ntaiment stru	ctures,	2006			
Supplementary reading								
1. EN 1990, Eurocode - Basic of structural design, 2002								

Field of s	study	Civ	vil Engineering								
Mode of	study	sta	itionary	Level	second	l cycle					
Graduate	e's qualif	<i>ication</i> ma	ngister	I			V	VBiA			
Area(s) c	of study	na	uki techniczne						<u> </u>		_
Educatio	onal profi	le ge	neral academic				1 [
Module								- 11			
Course u	unit	Co	mplex Metal S	Structures II				- 11	11	臣	
Code			- BIA/S2CE/ES/D/1					- 11	11	ШП	
Field of s	specialisa	ation En	gineering Struc	tures			1	- 11	11		
Administ			kład Teorii Kons						Ш.	L	
ECTS		4,0		ECTS (forms)	4,0						
Form of a			amination	Language	english	1	_				
Electives				Elective grou		1	_				
					0			· ·		<u> </u>	
Form of i						ECTS		eight		Credi	-
project c	course	P		30		2,0		,50		credit	-
lecture		N	1 2	30		2,0	0,	,50	exa	amina	tion
Leading	teacher			gnieszka (Agnieszl			-				
Other tea	achers			orzata (Malgorzata vski@zut.edu.pl)	a.Abramowic	z@zut.edu.p	ol), Pacz	kowski \	Wiesła	aw	
Prerequis	isites										
W-1	Passed	Complex Metal	Structures								
Module/c	course ur	nit objectives									
C-1	Ability	to design compl	ex metal structur	es objects							
C-2	Develo	ping skills of ind	ependent solving	of problems related	to steel cons	truction					
Course c	content d	ivided into var	ious forms of in	struction					Num	ber of	hours
T-P-1	(assem	bly, workshop s	ection, selected o	. Evaluating of the li construction and ass			eparation	٦ ١			30
T-W-1	- steel - flyove - plasti - large		2	ctures: ms, building and ass	embly of the s	structure)					30
Student	workload	l - forms of act	ivity						Num	ber of	hours
A-P-1		pation in classes									30
A-P-2	Individ	ual preparation o	of design assignn	nent							27
A-P-3	Contro	lled assessment									3
A-W-1	Partici	pation in lectures	5								30
A-W-2	Prepar	ing for the exam	(own work)								27
A-W-3	Particip	pation in the exa	m								3
Teaching	g method	ls / tools									
M-1	Lecture	2									
M-2	Project										
Evaluatio	on metho	ods (F - progres	ssive, P - final)						_		_
S-1	Р	Passing the exa	m								
S-2	Р	Passing the con	trolled assignme	nt							
	Desigr	ned learning ou	Itcomes	Reference to the learning outcomes designed for the fields o study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course con	ntent	Teaching methods	Evaluation methods
Knowled	lge			I	1	1	1				1
	J-										

B-A_2A_ES/D/10_W01 The student is able to distinguish, define and identify certain complex objects of metal construction (halls, flyovers, large span covers), propose their construction and technological solutions ensuring an appropriate level of security and technological	B-A_2A_W05 B-A_2A_W08 B-A_2A_W10	P7S_WG_TA21	P75_WG_IA21	C-1 C-2	T-W-1		M-1	S-1 S-2
Skills								
CE_2A_ES/D/10_U01 The student is able to project basics elements complex objects of metal construction	B-A_2A_U17 B-A_2A_U25	P7S_UK P7S_UW_TA22 P7S_UW_TA23 P7S_UW_TA24		C-2	T-P-1		M-2	S-2
Other social / personal competences								
CE_2A_ES/D/10_K01 The student is able in both professional and social way to project and understand basics elements of complex objects of metal construction	B-A_2A_K02 B-A_2A_K03	P7S_KK		C-1 C-2	T-P-1	T-W-1	M-1 M-2	S-2
Required reading								
1. Biegus A., Steel hall buildings, Arkady, warszawa, 200	3							
2. Kucharczuk W. Labocha S., Steel halls. Designer's guid	de, Polskie Wyd	lawnictwo Tecł	niczne, 2012					
3. Łubiński M., Metal structures, cz II, Arkady, Warszawa,	2004							
4. Matysiak A., Steel Construction: EOT Crane beams, fly	overs, PWN, W	arszawa-Pozna	ń, 1994					
5. Giżejowski M., General construction, t5, Steel structure	es of buildings,	design by Euro	codes with ex	ample	s, Arkady	, Warsz	zawa, 2	010
Supplementary reading								
1. Pałkowski Sz., Steel structures. Selected problems of c	alculation and	design, PWN, V	Varszawa, 201	.0				
2. Kapela M., Sieczkowski J., Designing the construction of Warszawa. 2003	of multi-storey b	ouildings, Oficy	na Wydawnicz	za Polit	echniki V	Varszav	vskej,	

Warszawa, 2003

Field of s								7				
	study		Civil E	Engineering								
Mode of	f study		statio	nary	Level	second	cycle					
Graduate	e's quali	ification	magis	ster	_	I		V	VBi/	Δ		
Area(s) d	of study		nauki	techniczne				v		`		_
Educatio	onal prof	file	gener	al academic				1 [ПΕ		
Module	· ·											
Course ι	unit		Com	outer Aided M	etal Structure	es Design						
Code			-	/S2CE/ES/D/14							ΙП	
Field of s	specialis	ation		eering Structur	es			1				
Administ			-	d Teorii Konstru						U	ᆘᄖ	
ECTS			2,0		ECTS (forms)	2,0		-				_
Form of	course d	credit	credit	S	Language	english		_				
Electives				-	Elective group	-		_				
Form of	-	ion	Code	Semester	Hours		ECTS		eight	(Credit	
			L	2	30		1,3		,50		redits	
laborato lecture			W	2	15		0,7		,50	-	redit	
							0,7	0	,50	C	reuits	>
Leading	teacher		•	l Piotr (Piotr.Pop nowicz Małgorz						nko Ac	nioczi	(2)
Other te	eachers			eszka.Pelka-Sav			z@zut.euu.p)), Peik	a-sawe	IIKO AGI	meszr	d
Prerequi	isites											
14/ 7	Comp	uter skills. Kn	owledg	e of the main me	chanical and tec	hnological pro	perties of stee	el and th	ne basic	range of	steel	
W-1	produ	cts; ability to	design	and construct sir	nple steel eleme	nts (beams, co	olumns, bearin	ngs); kn	owledge	of the b	asic de	esign
	produ princi	cts; ability to ples of steel h	design alls.	and construct sir	nple steel eleme	nts (beams, co	olumns, bearin	ngs); kn	owledge	of the b	asic de	esign
	produ princij course u	cts; ability to ples of steel h Init objective	design nalls. es	and construct sir	nple steel eleme	nts (beams, co		ngs); kn	owledge	of the b		esign
Module/d C-1	produ princij <i>course u</i> The st	cts; ability to ples of steel h <i>init objective</i> tudent can cro	design alls. es eate dra	and construct sir	nple steel eleme	nts (beams, co		ngs); kn	owledge			
Module/c C-1	produ princij /course u The st	cts; ability to ples of steel h init objective tudent can cre divided into	design halls. es eate dra variou	and construct sir	nple steel eleme ation of a building uction	nts (beams, co) with steel str		ngs); kn	owledge	Numb		
Module/o C-1 Course c	produ princij /course u The st content o The do The us to the	cts; ability to ples of steel h unit objective tudent can cre divided into esign of the b se of CAD pro Bocad progra	design halls. es eate dra variou uilding grams am (Tel	and construct sir awing documenta s forms of instru- structure made of to prepare drawin kla): structural mo	nple steel eleme ation of a building uction of hot-rolled elem	nts (beams, co with steel str ents. n of complex r	ucture netal structur	es. Intro	owledge	Numb		hours
Module/c C-1 Course c T-L-1 T-W-1	course u The st content o The du The us to the prame	cts; ability to ples of steel h unit objective tudent can cru divided into esign of the b se of CAD pro Bocad progra	design nalls. es eate dra variou uilding grams am (Tel interact	and construct sir awing documenta is forms of instru- structure made of to prepare drawir kla): structural mo tive tables.	nple steel eleme ation of a building uction of hot-rolled elem	nts (beams, co with steel str ents. n of complex r	ucture netal structur	es. Intro	owledge	Numb	per of	<i>hours</i> 30 15
Module/c C-1 Course c T-L-1 T-W-1	produ princij /course u The st content o The u to the prame	cts; ability to ples of steel h unit objective tudent can cre divided into esign of the b se of CAD pro Bocad progra	design halls. eas eate dra variou uilding grams am (Tel interact activit	and construct sir awing documenta is forms of instru- structure made of to prepare drawir kla): structural mo tive tables.	nple steel eleme ation of a building uction of hot-rolled elem	nts (beams, co with steel str ents. n of complex r	ucture netal structur	es. Intro	owledge	Numb	per of	<i>hours</i> 30 15
Module/o C-1 Course c T-L-1 T-W-1 Student	course u The st content o The us to the prame	cts; ability to ples of steel h unit objective tudent can cre divided into esign of the b se of CAD pro Bocad progra atric macros, id - forms of ipation in clas	design halls. eate dra variou uilding grams am (Tel interact activit sses	and construct sir awing documenta is forms of instru- structure made of to prepare drawir kla): structural mo tive tables.	nple steel eleme ation of a building uction of hot-rolled elem ng documentation odeling, drawing	nts (beams, co with steel str ents. n of complex r	ucture netal structur	es. Intro	owledge	Numb	per of	hours 30 15 hours
Module/c C-1 Course c T-L-1 T-W-1 Student A-L-1	course u The st content o The us to the prame workloa Partic	cts; ability to ples of steel h unit objective tudent can cre divided into esign of the b se of CAD pro Bocad progra atric macros, id - forms of ipation in clas	design halls. es eate dra uilding grams am (Tel interact activit sses ion of d	and construct sir awing documenta s forms of instru- structure made of to prepare drawin kla): structural mo tive tables.	nple steel eleme ation of a building uction of hot-rolled elem ng documentation odeling, drawing	nts (beams, co with steel str ents. n of complex r	ucture netal structur	es. Intro	owledge	Numb	per of	hours 30 15 hours 30
Module/c C-1 Course c T-L-1 T-W-1 Student A-L-1 A-L-2	course u The st content o The u to the prame workloa Partic Partic	cts; ability to ples of steel h unit objective tudent can cro divided into esign of the b se of CAD pro Bocad progra etric macros, id - forms of ipation in clas dual preparat	design halls. es eate dra uilding grams am (Tel interact activit sses ion of d	and construct sir awing documenta s forms of instru- structure made of to prepare drawin kla): structural mo tive tables.	nple steel eleme ation of a building uction of hot-rolled elem ng documentation odeling, drawing	nts (beams, co with steel str ents. n of complex r	ucture netal structur	es. Intro	owledge	Numb	per of	hours 30 15 hours 30 9
Module/c C-1 Course c T-L-1 T-W-1 Student A-L-1 A-L-2 A-W-1 A-W-2	course u The st The st The st The us to the prame workloa Partici Indivio	cts; ability to ples of steel h unit objective tudent can cre divided into esign of the b se of CAD pro- ebric macros, ed - forms of ipation in class dual preparat ipation in lect	design halls. es eate dra uilding grams am (Tel interact activit sses ion of d	and construct sir awing documenta s forms of instru- structure made of to prepare drawin kla): structural mo tive tables.	nple steel eleme ation of a building uction of hot-rolled elem ng documentation odeling, drawing	nts (beams, co with steel str ents. n of complex r	ucture netal structur	es. Intro	owledge	Numb	per of	hours 30 15 hours 30 9 15
Module/c C-1 Course c T-L-1 T-W-1 Student A-L-1 A-L-2 A-W-1 A-W-2	course u The st The st The st The us to the prame workloa Partici Indivio	cts; ability to ples of steel h unit objective tudent can cre divided into esign of the b se of CAD pro- enced progra- etric macros, and - forms of ipation in class dual preparat ipation in lect dual study ds / tools	design halls. es eate dra uilding grams am (Tel interact activit sses ion of d	and construct sir awing documenta s forms of instru- structure made of to prepare drawin kla): structural mo tive tables.	nple steel eleme ation of a building uction of hot-rolled elem ng documentation odeling, drawing	nts (beams, co with steel str ents. n of complex r	ucture netal structur	es. Intro	owledge	Numb	per of	hours 30 15 hours 30 9 15
Module/c C-1 Course c T-L-1 T-W-1 Student A-L-1 A-L-2 A-W-1 A-W-2 Teaching	course u The st content o The u to the prame workloa Partic Indivio g methoo	cts; ability to ples of steel h init objective tudent can cre divided into esign of the b se of CAD pro- end o	design halls. es eate dra uilding grams am (Tel interact activit sses ion of d	and construct sir awing documenta s forms of instru- structure made of to prepare drawin kla): structural mo tive tables.	nple steel eleme ation of a building uction of hot-rolled elem ng documentation odeling, drawing	nts (beams, co with steel str ents. n of complex r	ucture netal structur	es. Intro	owledge	Numb	per of	hours 30 15 hours 30 9 15
Module/a C-1 Course a T-L-1 T-W-1 Student A-L-1 A-L-2 A-W-1 A-W-2 Teaching M-1 M-2	produ princij (course u The st content o The us to the prame workloa Partici Indivio Partici g methoo Lectur Projec	cts; ability to ples of steel h init objective tudent can cre divided into esign of the b se of CAD pro- end o	design halls. ess eate dra variou uilding grams am (Tel interact activit sses ion of d ures	and construct sir awing documenta is forms of instr structure made of to prepare drawin kla): structural mo tive tables.	nple steel eleme ation of a building uction of hot-rolled elem ng documentation odeling, drawing	nts (beams, co with steel str ents. n of complex r	ucture netal structur	es. Intro	owledge	Numb	per of	hours 30 15 hours 30 9 15
Module/a C-1 Course c T-L-1 T-W-1 Student A-L-2 A-W-1 A-W-2 Teaching M-1 M-2 Evaluatia S-1	produ princij (course u The st content o The us to the prame workloa Partici Indivio Partici g methoo Lectur Projec	cts; ability to ples of steel h init objective tudent can cre divided into esign of the b se of CAD pro- end of coms of ipation in class dual preparat ipation in lect dual study ds / tools re ct ct pods (F - pro-	design halls. es eate dra uilding grams am (Tel interact activit sses ion of d tures	and construct sir awing documenta is forms of instr structure made of to prepare drawin kla): structural mo tive tables.	nple steel eleme ation of a building uction of hot-rolled elem ng documentation odeling, drawing	nts (beams, co with steel str ents. n of complex r	ucture netal structur	es. Intro	owledge	Numb	per of	hours 30 15 hours 30 9 15
Module/o C-1 Course c T-L-1 T-W-1 Student A-L-1 A-L-2 A-W-1 A-W-2 Teaching M-1 M-2 Evaluatio	course u The st content o The du to the prame workloa Partici Indivio g metho Lectur Projec	cts; ability to ples of steel h init objective tudent can cre divided into esign of the b se of CAD pro- end of coms of ipation in class dual preparat ipation in lect dual study ds / tools re ct ct pods (F - pro-	design halls. ess eate dra variou uilding grams am (Tel interacti activit sess ion of d ures gressiv contro	and construct sir awing documenta s forms of instr- structure made of to prepare drawin kla): structural mo tive tables.	nple steel eleme ation of a building uction of hot-rolled elem ng documentation odeling, drawing	nts (beams, co with steel str ents. n of complex r	ucture netal structur	es. Intro	owledge	Numb	per of	hours 30 15 hours 30 9 15
Module/o C-1 Course c T-L-1 T-W-1 Student A-L-2 A-W-1 A-W-2 Teaching M-1 M-2 Evaluatio S-1	produ princij /course u The st content o The du to the prame ? workloa Partici Indivio 9 metho Partici Indivio g metho Projec	cts; ability to ples of steel h init objective tudent can cre divided into esign of the b se of CAD pro- estric macros, d - forms of ipation in class dual preparat ipation in lect dual study ds / tools re ct passing the	design halls. ess eate dra variou uilding grams am (Tel interact activit sess ion of d ures gressiv contro lecture	and construct sir awing documenta s forms of instr structure made of to prepare drawin (la): structural mo tive tables.	nple steel eleme ation of a building uction of hot-rolled elem ng documentation odeling, drawing	ents (beams, co with steel str ents. n of complex r generation, m	ucture netal structur	es. Intro	owledge	Numb	per of	hours 30 15 hours 30 9 15 6
Module/a C-1 Course c T-L-1 T-W-1 Student A-L-2 A-W-1 A-W-2 Teaching M-1 M-2 Evaluatia S-1	produ princij (course u The st content o The da The us to the prame workloa Partici Indivio g methoo Lectur Project ion meth P P	cts; ability to ples of steel h init objective tudent can created and the second control esign of the b se of CAD pro- estric macros, and - forms of ipation in class dual preparat ipation in lect dual study ds / tools re- ct pods (F - pro- Passing the Passing the	design halls. ess eate dra variou uilding grams am (Tel interact activit sess ion of d ures gressiv contro lecture	and construct sir awing documenta s forms of instr structure made of to prepare drawin (la): structural mo tive tables.	nple steel eleme ation of a building uction of hot-rolled elem ng documentatio odeling, drawing t	Reference to the learning outcomes defined for the particular areas of	ucture netal structur acrodefinitior	es. Intro es. Intro s, COPL	owledge	Numb	per of	hours 30 15 hours 30 9 15 6
Module/C C-1 Course C T-L-1 T-W-1 Student A-L-2 A-W-1 A-W-2 Teaching M-1 M-2 Evaluatio S-1 S-2 Knowled CE_2A_ES/I	produ princij (course u The st content o The da The us to the prame workloa Partici Indivio Partici Indivio g metho Partici Indivio g metho Partici indivio g metho Partici Indivio g metho Partici Desig	cts; ability to ples of steel h init objective tudent can cre divided into esign of the b se of CAD pro- Bocad progra etric macros, ind - forms of ipation in class dual preparat ipation in lect dual study ds / tools re et pods (F - pro- Passing the passing the	design halls. es eate dra variou uilding grams am (Tel interact activit ses ion of d ures gressiv contro lecture	and construct sir awing documenta s forms of instr structure made of to prepare drawin (la): structural mo tive tables.	nple steel eleme ation of a building uction of hot-rolled elem ng documentatio odeling, drawing t	Reference to the learning outcomes defined for the particular areas of	ucture netal structur acrodefinitior	es. Intro es. Intro s, COPL	owledge	Numb	per of	hours 30 15 hours 30 9 15 6
Module/a C-1 Course a T-L-1 T-W-1 Student A-L-1 A-L-2 A-W-1 A-W-2 Teaching M-1 M-2 Evaluatia S-1 S-2 Knowled CE_2A_ES/I The studen	produ princij (course u The st content o The da The us to the prame workloa Partici Indivio Partici Indivio g metho Partici Indivio g metho Partici indivio g metho Partici Indivio g metho Partici Desig	cts; ability to ples of steel h init objective tudent can cre divided into esign of the b se of CAD pro- Bocad progra etric macros, ind - forms of ipation in class dual preparat ipation in lect dual study ds / tools re et pods (F - pro- Passing the passing the	design halls. es eate dra variou uilding grams am (Tel interact activit ses ion of d ures gressiv contro lecture	and construct sir awing documenta is forms of instr- structure made of to prepare drawin kla): structural mo tive tables.	nple steel eleme ation of a building uction of hot-rolled elem ng documentation odeling, drawing t t	nts (beams, co g with steel str eents. n of complex r generation, m Reference to the learning outcomes defined for the particular areas of education	ucture netal structur acrodefinitior	es. Intro es. Intro s, COPL	owledge	Numb	per of	hours 30 15 hours 30 9 15 6
Module/a C-1 Course o T-L-1 T-W-1 Student A-L-1 A-L-2 A-W-1 A-W-2 Teaching M-1 M-2 Evaluatio S-1 S-2 Knowled CE_2A_ES/t The studen steel struct Skills CE_2A_ES/t The studen	produ princij /course u The st content o The da The us to the prame workloa Partici Indivio Partici Indivio g metho Partici Indivio g metho Partici indivio g metho Partici fon meth P P Desig	cts; ability to ples of steel h init objective tudent can cre divided into esign of the b se of CAD pro- end of th	design halls. es eate dra variou uilding grams am (Tel interact activit ses ion of d ures gressiv contro lecture g outco ds of ma	and construct sir awing documenta is forms of instr- structure made of to prepare drawin kla): structural mo- tive tables. (y) lesign assignment (c, P - final) lled assignment test omes aking drawings of	nple steel eleme ation of a building uction of hot-rolled elem ng documentation odeling, drawing t t	nts (beams, co g with steel str eents. n of complex r generation, m Reference to the learning outcomes defined for the particular areas of education	Ucture netal structur acrodefinitior Reference to learning outcomes leading to the degree of "inżynier" P75_WG_IA21 P75_UW_IA22	es. Intro es. Intro s, COPL	owledge	Numb	per of	hours 30 15 hours 30 9 15 6

CE_2A_ES/D/11_K01 Student has awareness of the need for individual studying and upgrading professional skills	B-A_2A_K01	P7S_KK	C-1	T-L-1	T-W-1	M-1 M-2	S-1 S-2
Required reading							
1. BOCAD Service International, COPL - Bocad - 3D, własr	ne, Bohun, 2011						
Supplementary reading							
1. Bocad, Bocad 3D manual, Bocad, Ostrów Wlkp., 2011							

		1						
Field of st	udy	Civ	vil E	ngineering	1			
Mode of s	tudy	sta	atior	nary	Level	second cycle		
Graduate'	s qualif	<i>ication</i> ma	agis	ter			WBi/	7
Area(s) of	study	na	auki	techniczne				`
Education	al profil	e ge	enera	al academic				
Module								
Course un	nit	Tł	heor	ry of Construc	tions II			
Code				S2CE/ES/D/15			-	
Field of sp	pecialisa		-	eering Structure	25			
Administe			-	d Teorii Konstru				
ECTS		3,0			ECTS (forms)	3,0		
Form of co	ourso ci			nation	Language	english	_	
Electives			\ann	nation	Elective group			
			.					
Form of in			ode	Semester	Hours	ECTS	Weight	Credit
laboratory	/ course		L	2	30	1,5	0,50	credits
lecture		V	W	2	15	1,5	0,50	examination
Leading te	eacher	Sil	licki	Adrian (Adrian.	Silicki@zut.edu.pl)		
Other tead	chers							
Prerequisi	ites							
W-1	Mather	natics						
W-2	Strengt	h of materials						
Module/co	burse ur	nit objectives						
C-1		-	lcula	te internal forces	and stresses in thin	-walled structures		
C-2	Create	an ability to sol	lve s	tability problems	of thin-walled struct	tures		
Course co	ntent d	ivided into vai	rious	s forms of instru	uction			Number of hours
T-L-1	Calcula	tion of geometr	rical	characteristics of	cross-sections of th	in-walled bars		10
T-L-2	Calcula	tion of internal	force	es and stress in t	hin-walled structure	S		10
T-L-3	Calcula	tion of critical f	force	of thin-walled ba	rs			10
T-W-1	Cross-s	ection geometr	rical	characteristics of	thin-walled bars			5
T-W-2	Interna	l forces and stre	ess i	n thin-walled stru	ictures			5
T-W-3	Stabilit	y of thin-walled	l stru	ctures				5
Student w	orkload	- forms of act	tivit	У				Number of hours
A-L-1	Attend	ance at classes						30
A-L-2	Prepari	ng for classes						10
A-L-3		n of material						5
A-W-1		ce on lectures						15
A-W-2		ual study						19
A-W-3		n of material						8
A-W-4	Exam							3
Teaching								
M-1	Lecture		- h -					
M-2		s at computer la		-				
		ds (F - progre						
S-1	F				work and activity			
5-2	F	Evaluation of la	abora	atory exercises				
C 2		Test		•				
S-3 S-4	P	Test Exam						

Designed learning outcomes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course o	content	Teaching methods	Evaluation methods
Knowledge								
B-A_2A_ES/D/12_W01 Has detailed knowledge within the scope of theory of thin-walled bars	B-A_2A_W05 B-A_2A_W06	P7S_WG_TA21	P7S_WG_IA21	C-1 C-2	T-W-1 T-W-2	T-W-3	M-1	S-4
Skills								
B-A_2A_ES/D/12_U01 Is able to formulate and solve problems of static and stability analysis of thin-walled structures	B-A_2A_U10 B-A_2A_U19	P7S_UW_TA21 P7S_UW_TA24	P7S_UW_IA21	C-1 C-2	T-L-1 T-L-2	T-L-3	M-2	S-1 S-2 S-3
Other social / personal competences								
B-A_2A_ES/D/12_K01 Is aware of responsibility for reliability of the obtained results of his/her calculations	B-A_2A_K02	P7S_KK		C-1 C-2	T-L-1 T-L-2	T-L-3	M-2	S-1 S-2
Required reading								
1. Jack R. Vinson, The Behavior of Thin Walled Structures	: Beams, Plates	and Shells, Sp	oringer, 1989					
2. Dan Dubina (et al., eds.), Design of Cold-Formed Steel	Structures, Wile	ey - Blackwell,	2012					
3. Wei-Wen Yu, Cold-Formed Steel Design, John Wiley an	d Sons, New Yor	k, 2000						

Field of s				ingineering				7				
	study	(C		ingineering								
Mode of :	study	s	statio	nary	Level	second	cycle]				
Graduate	e's qualif	<i>ication</i> n	nagis	ter	•	I		M	VBi/	4		
Area(s) o	of study	n	nauki	techniczne				v .		`		_
Educatio	nal profi	le g	gener	al academic				1 Г				
Module												
Course u	ınit	C	Diagr	nostics and M	odernization	of Buildings	5					
Code			-	S2CE/ES/D/16							Π	
Field of s	specialisa			eering Structur	es			1				
Administ	tering fac	culty K	Kated	ra Budownictw	a Ogólnego				\square		1 4	
ECTS	_	2	2,0		ECTS (forms)	2,0		-				_
Form of a	course ci		redit	S	Language	english		1				
Electives					Elective group			1				
Form of i	instructio	on c	Code	Semester	Hours		ECTS		eight	(Credit	-
project c			P	3	15		1,0		.50		redits	
lecture			W	3	15		1,0	-	,50	-	redits	
	too-4							0,	,50		- Cuits	ر
Leading					omuald.Orlowic				akazut	t odu ol) ()	hicki
Other tea	achers				ibicki@zut.edu.						<i>ι</i> , σκπ	
Prerequis	sites											
W-1		th of materials	s (basi	c)								
Madula		nit objectives										
mouule/c	Louise ui	iit objectives	5									
C-1		•		g repair methods	5							
	Basic k	nowledge of b	ouildin		s f cracked building	IS.						
C-1 C-2	Basic k Basic k	nowledge of b	ouildin ules o		f cracked building	IS.				Numb	er of	hours
C-1 C-2	Basic k Basic k content d Moderr	nowledge of b nowledge of r <i>ivided into va</i> nisation of buil	ouildin ules o <i>ariou</i> Iding o	f investigation of s forms of instr design	f cracked building <i>ruction</i>					Numb	per of	hours 15
C-1 C-2 Course c	Basic k Basic k content d Moderr Design	nowledge of b nowledge of r <i>ivided into va</i> nisation of buil	ules o ariou ding o f mod	f investigation of s forms of instr design ernisation of buil	f cracked building		d strengtheni	ng. Crac	k	Numb	er of	
C-1 C-2 Course c T-P-1 T-W-1	Basic k Basic k content d Moderr Design patterr	nowledge of b nowledge of re <i>ivided into va</i> nisation of buil procedures of	ules o ariou ding o f mod	f investigation of s forms of instr design ernisation of buil their cause.	f cracked building <i>ruction</i>		d strengtheni	ng. Crac	k	Numb		15 15
C-1 C-2 Course c T-P-1 T-W-1	Basic k Basic k content d Modern Design pattern workloac	inowledge of b mowledge of ru <i>ivided into va</i> nisation of buil procedures of ns for buillding	ules o ariou ding o f mod	f investigation of s forms of instr design ernisation of buil their cause.	f cracked building <i>ruction</i>		d strengtheni	ng. Crac	k			15 15
C-1 C-2 Course C T-P-1 T-W-1 Student M A-P-1 A-P-2	Basic k Basic k Content d Modern Design pattern Workloac Design	nowledge of b nowledge of ru <i>ivided into va</i> nisation of buil procedures of s for buillding <i>I - forms of a</i>	ouildin ules o ariou ding o f mod is and ctivit	f investigation of s forms of instr design ernisation of buil their cause.	f cracked building <i>ruction</i>		d strengtheni	ng. Crac	k			15 15 hours
C-1 C-2 Course co T-P-1 T-W-1 Student of A-P-1 A-P-2 A-W-1	Basic k Basic k content d Design patterr workloac Design Individ Particip	nowledge of b nowledge of re <i>ivided into va</i> nisation of buil procedures of s for buillding <i>I - forms of a</i> workshop ual student wo pation in classe	ariou ding of mod s and ctivit	f investigation of s forms of instr design ernisation of buil their cause.	f cracked building <i>ruction</i>		d strengtheni	ng. Crac	k			15 15 hours 15 15 15
C-1 C-2 Course C T-P-1 T-W-1 Student M A-P-1 A-P-2	Basic k Basic k content d Design patterr workloac Design Individ Particip	nowledge of b nowledge of ru <i>ivided into va</i> nisation of buil procedures of ns for buillding <i>I - forms of a</i> workshop ual student wo	ariou ding of mod s and ctivit	f investigation of s forms of instr design ernisation of buil their cause.	f cracked building <i>ruction</i>		d strengtheni	ng. Crac	k			15 15 hours 15 15
C-1 C-2 Course co T-P-1 T-W-1 Student of A-P-1 A-P-2 A-W-1 A-W-2 Teaching	Basic k Basic k Basic k Modern Design pattern workloac Design Individ Particip Individ	nowledge of b nowledge of ru <i>ivided into va</i> nisation of buil procedures of s for buillding <i>I - forms of a</i> workshop ual student wo pation in classe ual student wo	ariou ding of mod s and ctivit	f investigation of s forms of instr design ernisation of buil their cause.	f cracked building <i>ruction</i>		d strengtheni	ng. Crac	k			15 15 hours 15 15 15
C-1 C-2 Course C T-P-1 T-W-1 Student v A-P-1 A-P-2 A-W-1 A-W-2 Teaching M-1	Basic k Basic k Basic k Modern Design pattern workloac Design Individ Particip Individ g methoc	nowledge of b nowledge of ru <i>ivided into va</i> nisation of buil procedures of ns for buillding <i>I - forms of a</i> workshop ual student wo pation in classe ual student wo <i>Is / tools</i>	ariou ding of mod s and ctivit	f investigation of s forms of instr design ernisation of buil their cause.	f cracked building <i>ruction</i>		d strengtheni	ng. Crac	k			15 15 hours 15 15 15
C-1 C-2 Course c T-P-1 T-W-1 Student v A-P-1 A-P-2 A-W-1 A-W-2 Teaching M-1 M-2	Basic k Basic k Basic k Design patterr workloac Design Individ Particip Individ g methoc Design	nowledge of b nowledge of re <i>ivided into va</i> nisation of buil procedures of s for buillding <i>I - forms of a</i> workshop ual student wo bation in classe ual student wo <i>Is / tools</i> es workshop	ouildin ules o ariou ding o f mod s and octivit ork es ork	f investigation of s forms of instr design ernisation of buil their cause. y	f cracked building <i>ruction</i>		d strengtheni	ng. Crac	k			15 15 hours 15 15 15
C-1 C-2 Course c T-P-1 T-W-1 Student v A-P-1 A-P-2 A-W-1 A-W-2 Teaching M-1 M-2 Evaluatic	Basic k Basic k Basic k Design patterr workload Design Individ Particip Individ parterr Lecture Design	nowledge of b nowledge of ru <i>ivided into va</i> nisation of buil procedures of s for buillding <i>I - forms of a</i> workshop ual student wo bation in classe ual student wo <i>Is / tools</i> es workshop <i>ods (F - progr</i>	ariou ariou ding o f mod s and ork es ork es ork	f investigation of s forms of instr design ernisation of buil their cause. y	f cracked building <i>ruction</i>		d strengtheni	ng. Crac	k			15 15 hours 15 15 15
C-1 C-2 Course co T-P-1 T-W-1 Student of A-P-1 A-P-2 A-W-1 A-W-2 Teaching M-1 M-2 Evaluation S-1	Basic k Basic k Basic k Modern Design patterr workloac Design Individ Particip Individ g methoc Design Design	nowledge of b nowledge of re <i>ivided into va</i> nisation of buil procedures of s for buillding <i>I - forms of a</i> workshop ual student wo bation in classe ual student wo <i>Is / tools</i> es workshop <i>ods (F - progr</i> Written exam	ariou ariou ding o f mod s and ork es ork es ork	f investigation of s forms of instr design ernisation of buil their cause. y	f cracked building <i>ruction</i>		d strengtheni	ng. Crac	k			15 15 hours 15 15 15
C-1 C-2 Course c T-P-1 T-W-1 Student v A-P-1 A-P-2 A-W-1 A-W-2 Teaching M-1 M-2 Evaluatic	Basic k Basic k Basic k Design patterr workload Design Individ Particip Individ parterr Lecture Design	nowledge of b nowledge of ru <i>ivided into va</i> nisation of buil procedures of s for buillding <i>I - forms of a</i> workshop ual student wo bation in classe ual student wo <i>Is / tools</i> es workshop <i>ods (F - progr</i>	ariou ariou ding o f mod s and ork es ork es ork	f investigation of s forms of instr design ernisation of buil their cause. y	f cracked building <i>ruction</i>		d strengtheni	ng. Crac	k			15 15 hours 15 15 15
C-1 C-2 Course co T-P-1 T-W-1 Student of A-P-1 A-P-2 A-W-1 A-W-2 Teaching M-1 M-2 Evaluation S-1	Basic k Basic k Basic k Modern Design patterr workload Design Individ Particip Individ Particip Individ Design Lecture Design On method	nowledge of b nowledge of re <i>ivided into va</i> nisation of buil procedures of s for buillding <i>I - forms of a</i> workshop ual student wo bation in classe ual student wo <i>Is / tools</i> es workshop <i>ods (F - progr</i> Written exam	ouildin ules o ariou ding o f mod s and ctivit ork es ork es ork	f investigation of s forms of instr design ernisation of buil their cause. y	f cracked building <i>ruction</i>		d strengtheni d strengtheni Reference to learning outcomes leading to the degree of "inzynier"	ng. Crac	k Course c	Numb	per of	15 15 15 15 15 15
C-1 C-2 Course co T-P-1 T-W-1 Student of A-P-1 A-P-2 A-W-1 A-W-2 Teaching M-1 M-2 Evaluation S-1	Basic k Basic k Basic k Basic k Design patterr workloac Design Individ Particip Individ g methoo Design Design on metho P P	nowledge of b nowledge of re ivided into va hisation of buil procedures of s for buillding d - forms of a workshop ual student wo bation in classe ual student wo s / tools es workshop ods (F - progr Written exam Project works	ouildin ules o ariou ding o f mod s and ctivit ork es ork es ork	f investigation of s forms of instr design ernisation of buil their cause. y	f cracked building <i>uction</i> dings. Investigati Reference to the learning outcomes designed for the fields of	on, repairs an	Reference to learning outcomes leading to the	Course		Numb	eer of	15 15 15 15 15 15
C-1 C-2 Course c T-P-1 T-W-1 Student i A-P-1 A-P-2 A-W-1 A-W-2 Teaching M-1 M-2 Evaluatic S-1 S-2 S-2 Knowleds B-A 2A ES/	Basic k Basic k Basic k Basic k Design patterr workload Design Individ Particip Individ Design Design Design Design Design Design Sextended	knowledge of b nowledge of re <i>ivided into va</i> nisation of buil procedures of s for buillding <i>I - forms of a</i> workshop ual student wo bation in classe ual student wo <i>Is / tools</i> es workshop <i>ods (F - progr</i> Written exam Project works ned learning knowledge over	ouildin ules o ariou ding o f mod s and octivit ork es ork es ork	f investigation of s forms of instr design ernisation of buil their cause. y re, P - final) omes	f cracked building <i>uction</i> dings. Investigati Reference to the learning outcomes designed for the fields of	on, repairs an	Reference to learning outcomes leading to the	Course objectives		Numb	eer of	15 15 15 15 15 15
C-1 C-2 Course c T-P-1 T-W-1 Student v A-P-1 A-P-2 A-W-1 A-W-2 Teaching M-1 M-2 Evaluatic S-1 S-2 S-2 Knowledg B-A_2A_ES/ Student has	Basic k Basic k Basic k Basic k Design patterr workload Design Individ Particip Individ Design Design Design Design Design Design Sextended	knowledge of b nowledge of re <i>ivided into va</i> nisation of buil procedures of s for buillding <i>I - forms of a</i> workshop ual student wo bation in classe ual student wo <i>Is / tools</i> es workshop <i>ods (F - progr</i> Written exam Project works ned learning knowledge over	ouildin ules o ariou ding o f mod s and octivit ork es ork es ork	f investigation of s forms of instr design ernisation of buil their cause. y re, P - final) omes	f cracked building <i>uction</i> dings. Investigati Reference to the learning outcomes designed for the fields of study B-A_2A_W06	on, repairs an	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course c	Numb	Per of	15 15 15 15 15 15 Evaluation methods
C-1 C-2 Course C T-P-1 T-W-1 Student u A-P-2 A-W-1 A-W-2 Teaching M-1 M-2 Evaluatic S-1 S-2 Evaluatic S-1 S-2 Knowledg B-A_2A_ES/I Student has modernisati Skills B-A_2A_ES/I Student car	Basic k Basic k Basic k Basic k Design patterr workloac Design Individ Particip Individ Particip Individ Particip Individ Design Design Design Design Design	nowledge of b nowledge of re <i>ivided into va</i> nisation of buil procedures of s for buillding <i>I - forms of a</i> workshop ual student wo bation in classe ual student wo <i>Is / tools</i> es workshop <i>ods (F - progr</i> Written exam Project works hed learning of knowledge over ings.	ouildin ules o ariou ding o f mod s and ctivit ork es ork es ork es ork	f investigation of s forms of instr design ernisation of buil their cause. y re, P - final) omes	f cracked building <i>uction</i> dings. Investigati Reference to the learning outcomes designed for the fields of study B-A_2A_W06	on, repairs an	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course c	Numb	Per of	15 15 15 15 15 15 Evaluation methods

B-A_2A_ES/D/13_K01 Student can design needed repairs for buildings. Student can plan diagnostic procedures for buildings. Student fells responsible for his repair choices.	B-A_2A_K01 B-A_2A_K02 B-A_2A_K06	P7S_KK P7S_KR	C-2	T-W-1	M-1 M-2	S-1 S-2
Required reading						
1. EN 1990: Eurocode - Basis of structural design, 2011						
2. EN 1996-1: Eurocode 6: Design of masonry structures,	2011					

Field of st	tudy	Civil E	Engineering				
Mode of s	tudy	statio	nary	Level	second cycle		
Graduate	's qualification	magis	ster			WBi/	Δ
Area(s) of	f study	nauki	techniczne				<u>`</u>
Education	al profile	gener	al academic				
Module							
Course ur	nit	Theo	ry of Elasticity	/ and Plasticity			
Code			/S2CE/ES/D/17	·			
	pecialisation		eering Structure	25			
•	ering faculty	-	d Teorii Konstru				
ECTS		2,0		ECTS (forms)	2,0		
	ourse credit	credit		Language	english		
Electives			.5	Elective group	crightin		
		Carda			FCTC		Credit
Form of ir		Code	Semester	Hours	ECTS	Weight	Credit
project co	ourse	P	3	15	1,0	0,50	credits
lecture		W	3	30	1,0	0,50	credits
Leading to		Silicka	a Ewa (Ewa.Silic	ka@zut.edu.pl)			
Other tea	chers						
Prerequis	ites						
W-1	Differential and int	-					
W-2	Analysis of stress a						
W-3	Acqaintance with g	eneral	laws iof theory of	plasticity.			
Module/co	ourse unit objective						
C-1	Acquaintance with	-		-			
C-2	-			I plane state of strain	ns.		
C-3	Acquaintance with		-	s for 3D structures.			
C-4	Acqaintance with c						
	ontent divided into						Number of hours
T-P-1	Revision of calculus				tesian coordinate syst	em	1
T-P-2	Levy'e differential	equatio	n and Airy's funct	ion solution.		em.	5
Т-Р-З	Problem of plane st Axisymmetrical sta				ar coordinate system.		3
T-P-4	Problem of classis				and stress in plates. F	Plate differential	4
T-P-5	equation solution. Test						2
T-W-1	Analysis of state of			- general information	n.		4
T-W-2		tate of s	stress and plane s	tate of strains in car	tesian coordinate syst	em.	6
T-W-3	Levy'e differential Analysis of plane st Axisymmetrical sta	tate of s	stress and plane s		ar coordinate system.		5
T-W-4	Analysis of state of Invariants of stress	stress		structures.			6
T-W-5				ess in plates. Plate di	ifferential equation.		5
T-W-6	Theory of plasticity	- gene	ral information.				4
	vorkload - forms of		<i>y</i>				Number of hours
A-P-1	Attending the class						15
A-P-2	Home assignments	;					9
A-P-2 A-P-3 A-W-1	Revision to test. Presence on lecture						6 30

Teaching	method	ls / tools								
M-1	Lectur	e								
M-2	Examp	le classes								
M-3	Home	assignments								
Evaluatio	n metho	ods (F - progressive, P - final)								
S-1	F	Mark of the final test								
	Desigr	ned learning outcomes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Cours	e content	Teaching methods	Evaluation methods
Knowledg	<i>je</i>									
	understand	ds general laws of stress and strains states neering structures.	B-A_2A_W03	P7S_WG_TA21	P7S_WG_IA21	C-1 C-2 C-3 C-4	T-W-1 T-W-2 T-W-3	T-W-4 T-W-5 T-W-6	M-1	S-1
Skills				I						
B-A_2A_ES/E Is able to an structures.		ss and strains states in simple engineering	B-A_2A_U17	P7S_UW_TA24		C-1 C-2 C-3 C-4	T-P-1 T-P-2 T-P-3	T-P-4 T-P-5	M-2 M-3	S-1
Other soc	cial / per	rsonal competences		1	1				1	1
B-A_2A_ES/E Understands calculations.	s responsil	bility for the profesionally made	B-A_2A_K02	Р75_КК		C-1 C-2 C-3 C-4	T-P-2 T-P-3	T-P-4	M-2 M-3	S-1
Required	reading	1								
1. Timoshe	enko s., C	Goodier J. N., Theory of Elasticity, McG	raw-Hill, New Yo	rk						

Course unit Timber Structures Code WBIA/S2CE/ES/D/18 Field of specialisation Engineering Structures Administering faculty Katedra Budownictwa Ogólnego ECTS 2.0 ECTS (forms) 2.0 Form of course credit credits Language english Electives Elective group english Credits Form of instruction Code Semester Hours ECTS Weight Credits Iecture W 3 30 1.0 0.40 credits Leading teacher Nowak Rafal (Rafal, Javorski (Bafal, Sout (Bafal, Javorski (Bafal, Javors				-		-					
Graduate's qualification magister mask itechniczne Arrea(s) of study nauki techniczne Biologia Graduate's qualification general academic Biologia Module Timber Structures Biologia Code WBM/S2CE/ES/D/18 Engineering Structures Biologia Administering faculty Katedra Budownictwa Ogólnego Credit Language english Electives Elective group ECTS Veight Credit Form of instruction Code Semester Hours ECTS Weight Credit Electives Elective group ECTS Weight Credit Credit Form of instruction Code Semester Hours ECTS Weight Credit Icetaring teacher Nowak Rafal (Rafal, Nowak@qut.edu.pl) Nowak Rafal (Rafal, Nowak@qut.edu.pl) Other teachers Strength of materials (basic) ModuleCourse unit objectives Course content divided into various forms of instruction Number of hours 15 C1 Basic knowledge of European Standards for timber structures 6 6 74/-2 Eagin and dealing or glueal laminated timber str	Field of s	study	Civil	Engineering							
Arcad (s) of study nauki techniczne Educational profile general academic Code WBIA/S2CE/ES/D/18 Field of Specialisation Engineering Structures Administering faculty Katedra Budownictwa Ogólnego ECTS 2,0 ECTS (forms) 2,0 Form of course credit credits Language english Electives Elective group Elective group Credits Credits Form of instruction Code Semester Hours ECTS Weight Credits Electives Istoreating and another structures Basic Nowak@zut.edu.pl) 0,40 credits Leading teacher Nowak Rafal (Rafal Nowak@zut.edu.pl) Nowak Rafal (Rafal Nowak@zut.edu.pl) Nowak Rafal (Rafal Nowak@zut.edu.pl) Strength of materials (basic) Module/course unit objectives Elective Strength of materials (basic) Module/course Strength of materials (basic) Module/course unit objectives Course of instructure Instructure Instructure Instructure C-2 Basic knowledge of tumber structure lengineering Course content divided into various forms of instructure Instructure Instructure </td <td>Mode of</td> <td>study</td> <td>stati</td> <td>onary</td> <td>Level</td> <td>second</td> <td>cycle</td> <td></td> <td></td> <td></td> <td></td>	Mode of	study	stati	onary	Level	second	cycle				
Arcad (s) of study nauki techniczne Educational profile general academic Code WBIA/S2CE/ES/D/18 Field of Specialisation Engineering Structures Administering faculty Katedra Budownictwa Ogólnego ECTS 2,0 ECTS (forms) 2,0 Form of course credit credits Language english Electives Elective group Elective group Credits Credits Form of instruction Code Semester Hours ECTS Weight Credits Electives Istoreating and another structures Basic Nowak@zut.edu.pl) 0,40 credits Leading teacher Nowak Rafal (Rafal Nowak@zut.edu.pl) Nowak Rafal (Rafal Nowak@zut.edu.pl) Nowak Rafal (Rafal Nowak@zut.edu.pl) Strength of materials (basic) Module/course unit objectives Elective Strength of materials (basic) Module/course Strength of materials (basic) Module/course unit objectives Course of instructure Instructure Instructure Instructure C-2 Basic knowledge of tumber structure lengineering Course content divided into various forms of instructure Instructure Instructure </td <td>Graduate</td> <td>e's qualif</td> <td><i>ication</i> mag</td> <td>ister</td> <td></td> <td></td> <td></td> <td>V</td> <td>VBiA</td> <td></td> <td></td>	Graduate	e's qualif	<i>ication</i> mag	ister				V	VBiA		
Module Timber Structures Code WBIA/S2CE/ES/D/18 Field of specialisation Engineering Structures Administering faculty Katedra Budownictwa Ogólnego ECTS 2,0 ECTS 2,0 Form of course credit Elective group Form of instruction Code Sements Hours ECTS Will 3 30 1,0 0,60 credits Leading teacher Nowak Rafat (Rafal, Nowak@zut.edu.pl) Nowak Rafat (Rafal, Nowak@zut.edu.pl) Rafat (Rafal, Nowak@zut.edu.pl) Other teachers Saymon (Szymon Skibickli@zut.edu.pl), Nowak Rafat (Rafal Nowak@zut.edu.pl) Number of hours Course content divided into various forms of instruction Number of hours Fer2 Call Basic knowledge of timber structure. 6 Fer3 6 Call Basic knowledge of tumber structure. 2 2 <td>Area(s) c</td> <td>of study</td> <td>naul</td> <td>ki techniczne</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>_</td>	Area(s) c	of study	naul	ki techniczne							_
Course unit Timber Structures Code WBIA/SZCE/ES/D/18 Field of specialisation Engineering Structures Administering faculty Katedra Budownictwa Ogônego ECTS 2,0 ECTS (forms) 2,0 Form of course credit credits Language english Electives Electrogroup Form of instruction Code Semester Hours ECTS Weight Credit project course P 3 15 1,0 0,60 credits Leading teacher Nowak Rafal (Rafal, Nowak@cut.edu.pl) Other teachers Jaworski Rafal (Rafal, Nowak@cut.edu.pl) Other teachers Strength of materials (basic) Modulecourse unit objectives Cole ECT Cole Number of hours C-1 Basic knowledge of European Standards for timber structure Strength of glueel Imminated timber structure. Strength of glueel Imminated timber structure. 15 T-4-1 Obegin and dealing of glueel Imminated timber structure. E 2 2 T-4-2 Types of glueel Imminated timber structure. E 2 2 T-4-3 Obegin on dossigluel Imminated tim	Educatio	onal profi	le gene	eral academic					- 11		
Code WBIA/S2CE/ES/D/18 Field of specialisation Engineering Structures Administering faculty Katedra Budownictwa Ogólnego ECTS 2.0 ECTS (forms) 2.0 Form of course credit credits Language english Electives Elective group Form of instruction Code Semester Hours ECTS Weight Credit Form of instruction Code Semester Hours ECTS Weight Credit Project course P 3 15 1.0 0.60 credits Leading teacher Nowak Rafal (Rafal_Nowak@zut.edu.pl) Outor teachers Szymon (Szymon.Skibicki@zut.edu.pl) Nowak Rafal (Rafal_Nowak@zut.edu.pl) Skibicki Module/course unit objectives C-1 Basic knowledge of timber structural engineering EC-2 Basic knowledge of timber structure. The structure of glued laminated timber. Charles Curse content divided into various forms of instruction Number of hours Tructures. 6 T-W-1 Design and detailing of glued laminated timber structure. 15 6	Module								- 11	70	ר.
Field of specialisation Engineering Structures Administering faculty Katedra Budownictwa Ogólnego 2.0 ECTS 2.0 ECTS (forms) 2.0 Form of course credit credits Language english Electives Elective group P 3 1.0 0.60 credits Elective P 3 1.5 1.0 0.60 credits Leading teacher Nowak Rafal (Rafal_Nowak@zut.edu.pl) 0.40 credits Leading teacher Nowak Rafal (Rafal_Nowak@zut.edu.pl), Nowak Rafal (Rafal_Nowak@zut.edu.pl), Skibicki Szymon (Szymon Skibicki@gut.edu.pl), Tkacz Piotr (Piotr.Tkacz@zut.edu.pl), Skibicki Prerequisites Symon (Szymon Skibicki@gut.edu.pl), Tkacz Piotr (Piotr.Tkacz@zut.edu.pl), Skibicki Multe/course Guarse content divided into various forms of instruction Number of hours France C-1 Basic knowledge of timber structure. The structure of glued laminated timber. 6 C-2.4 Basic knowledge of timber structure. The structure of glued laminated timber. 6 C-2.4 Basic knowledge of timber structure. 15 C-3 Design and detailing of glued lamined timber structure. 6	Course u	unit	Tim	ber Structures					- 11		: 1
Administering faculty Katedra Budownictwa Ogólnego CTS (forms) 2.0 Form of course credit credits Language english Electives Elective group Elective group Credits Credits Form of instruction Code Semester Hours ECTS Weight Credits Form of instruction Code Semester Hours ECTS Weight Credits Istruction Code Semester Hours ECTS Weight Credits Leading teacher Nowak Rafai (Rafal_Nowak@zut.edu.pl) Jusorski Rafai (Rafal_Nowak@zut.edu.pl) Jusorski Rafai (Rafal_Nowak@zut.edu.pl) Skibicki Other teachers Istrength of materials (basic) Weight Credits Strength of materials (basic) W-1 Strength of materials (basic) Module/course unit objectives Number of hours 15 Course content divided into various forms of instruction Number of hours 15 16 T/W-1 Introduction to glued laminated timber structure. 2 2 2 Course content divided into various forms of instruction Number of hours 15 <t< td=""><td>Code</td><td></td><td>WBI</td><td>A/S2CE/ES/D/18</td><td></td><td></td><td></td><td></td><td>- 11</td><td></td><td></td></t<>	Code		WBI	A/S2CE/ES/D/18					- 11		
ECTS 2.0 ECTS (forms) 2.0 Form of course credit credits Language english Electives Elective group Elective group Elective group Form of instruction Code Semester Hours ECTS Weight Credits project course P 3 15 1.0 0.60 credits leading teacher Nowak Rafai (Rafal_Nowak@zut.edu.pl) O.40 credits Credits Leading teacher Nowak Rafai (Rafal_Jaworski@zut.edu.pl), Nowak Rafai (Rafal_Nowak@zut.edu.pl) Nowak Rafai (Rafal_Jaworski@zut.edu.pl), Nowak Rafai (Rafal_Nowak@zut.edu.pl) Other teachers Strength of materials (basic) Strength of materials (basic) Module/course unit objectives C-1 Basic knowledge of European Standards for timber structures Issee and detailing of glued laminated timber structures 15 C-2 Basic knowledge of glued laminated timber structure. 22 24 C-2 Types of glued laminated timber structure. 24 24 C-3 Eurocodes (general structure, Basis of structural design of glued laminated timber. 6 T-W-2 Types of glued laminated timber structures. 4 <td>Field of s</td> <td>specialisa</td> <td>ation Engi</td> <td>neering Structur</td> <td>es</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Field of s	specialisa	ation Engi	neering Structur	es						
Form of course credit credits Language english Electives Elective group Elective group Elective group Form of instruction Code Semester Hours ECTS Weight Credits project course P 3 15 1.0 0.60 credits lecture W 3 30 1,0 0,40 credits Leading teacher Nowak Rafat (Rafal_Nowak@zut.edu.pl), Nowak Rafat (Rafal_Nowak@zut.edu.pl), Skibicki Strength of materials (basic) ModuleCourse unit objectives W-1 Strength of materials (basic) ModuleCourse unit objectives Ecca Rasic knowledge of European Standards for timber structures Course on the divided into various forms of instruction Number of hours T-P-1 Design and detailing of glued laminated timber structure. The structure of glued laminated timber. Charactesitis of glued laminated timber structures 2 2 T-W-2 Types of glued laminated timber structure. The structure of glued laminated timber structures. Intrudies glue of glue glue diaminated timber structure. Int	Administ	tering fac	culty Kate	dra Budownictwa	a Ogólnego					-	<u> </u>
Electives Elective group Form of instruction Code Semester Hours ECTS Weight Credits project course P 3 15 1.0 0.60 credits leading teacher Nowak Rafai (Rafal_Nowak@zut.edu.pl) Javorski Rafai (Rafal_Nowak@zut.edu.pl), Nowak Rafai (Rafal_Nowak@zut.edu.pl) Design of materials (basic) Javorski Rafai (Rafal_Nowak@zut.edu.pl), Tkacz Piotr (Piotr.Tkacz@zut.edu.pl) Skibicki Prerequisites W*1 Strength of materials (basic) Momental second Mumber of hours C-2 Basic knowledge of European Standards for timber structures Course content divided linto various forms of instruction Number of hours T-P-1 Design and detailing of glued lamined timber structure. 15 6 Ch-acctenstics of glued laminated timber structure. 2 7.4 7.9 6 T-W-2 Types of glued laminated timber structure. 6 6 6 T-W-3 Eurocodes (gueral structure, Basic of structural design and design of glued laminated timber. 6 6 T-W-4 Design of connections subjected to combined stresses. Stability of members. 4 4 T-W-5 Design of connections for	ECTS		2,0		ECTS (forms)	2,0					
Form of instruction Code Semester Hours ECTS Weight Credit project course P 3 15 1,0 0,60 credits lecture W 3 30 1,0 0,40 credits Leading teacher Nowak Rafal (Rafal_Nowak@zut.edu.pl) Nowak Rafai (Rafal_Nowak@zut.edu.pl), Nowak Rafai (Rafal_Nowak@zut.edu.pl), Skibicki Strength of materials (basic) Other teachers Javorski Rafai (Rafal_Nowak@zut.edu.pl), Tkacz Piotr (Piotr.Tkacz@zut.edu.pl), Skibicki Strength of materials (basic) Module/course unit objectives Module/course unit objectives Course content divided into various forms of instruction Number of hours C-2 Basic knowledge of European Standards for timber structures. The structure of glued laminated timber. 15 C-1 Introduction to glued laminated timber structure. The structure of glued laminated timber. 6 C-2 Types of glued laminated timber structure. 2 C-2 Types of glued laminated timber elements. 4 T-W-2 Types of glued laminated timber elements. 4 T-W-3 Exercise for subjected to combined stresses. Stability of members. 4 T-W-4 Design of Consections subjected to combined stresses. Stability of members. 4 T-W-5 Design of consections for glued laminated timber s	Form of o	course ci	redit cred	its	Language	english					
project course P 3 15 1,0 0,60 credits lecture W 3 30 1,0 0,40 credits leading teacher Nowak Rafal (Rafal_Mowak@zut.edu.pl) Jaworski Rafal (Rafal_Mowak@zut.edu.pl), Nowak Rafal (Rafal_Nowak@zut.edu.pl), Skibicki Other teachers Szymon (Szymon,Skibicki@zut.edu.pl), Tkacz Piotr (Piotr.Tkacz@zut.edu.pl), Skibicki Prerequisites W-1 Strength of materials (basic) Module/course unit objectives C-2 Basic knowledge of timber structural engineering C-2 Basic knowledge of European Standards for timber structures Number of hours Curse content divided into various forms of instruction Number of hours T-W-1 Infoduction to glued laminated timber structure. The structure of glued laminated timber structure. 2 T-W-2 Types of glued laminated timber structure. 2 T-W-3 Eurocodes (general structure, Basis of structural design and design of glued laminated timber structure. 4 T-W-4 Design of cross-sections subjected to combined stresses. Stability of members. 4 T-W-4 Design of cross-sections subjected to combined structures. 4	Electives	s			Elective group						
Instruction W 3 30 1.0 0.40 credits Leading teacher Nowak Rafa! (Rafal_Nowak@zut.edu.pl) Jaworski Rafa! (Rafal_Nowak@zut.edu.pl), Nowak Rafa! (Rafal_Nowak@zut.edu.pl), Skibicki Other teachers Jaworski Rafa! (Rafal_Nowak@zut.edu.pl), Nowak Rafa! (Rafal_Nowak@zut.edu.pl), Skibicki Prerequisites Szymon (Szymon, Skibicki@zut.edu.pl), Tkacz Piotr (Piotr.Tkacz@zut.edu.pl) W-1 Strength of materials (basic) Module/course unit objectives	Form of i	instructio	on Code	e Semester	Hours		ECTS	We	ight	Credi	t
Leading teacher Nowak Rafał (Rafal_Nowak@zut.edu.pl) Other teachers Jaworski Rafał (Rafal_Jaworski@zut.edu.pl), Nowak Rafał (Rafal_Nowak@zut.edu.pl), Skibicki Szymon (Szymon Skibicki@zut.edu.pl), Tkacz Piotr (Piotr.Tkacz@zut.edu.pl), Skibicki Prerequisites Strength of materials (basic) W-1 Strength of materials (basic) Module/course unit objectives C-1 Basic knowledge of timber structural engineering C-2 C-2 Basic knowledge of European Standards for timber structures Number of hours Course content divided into various forms of instruction Number of hours T-P.1 Design and detailing of glued lamined timber structure. 15 T-W-2 Types of glued laminated timber structure. 6 T-W-3 Eurocodes (general structure, Basis of structural design and design of glued laminated timber 6 T-W-4 Design of basic glued laminated timber structures. 4 T-W-5 Design of Connections for glued laminated timber structures. 4 T-W-6 Serviceability limit states in glued laminated timber structures. 4 T-W-7 Design of Connections for glued laminated timber structures. 4 T-W-6 Serviceability limit states in glued lamined timber structures. 4	project c	course	Р	3	15		1,0	0	,60	credit	S
Other teachers Jaworski Rafal (Rafal Jaworski@zut.edu.pl), Nowak Rafal (Rafal Nowak@zut.edu.pl), Skibicki Other teachers Jaworski Rafal (Rafal Jaworski@zut.edu.pl), Tkacz Piotr (Piotr.Tkacz@zut.edu.pl), Skibicki Prerequisites Wr.1 Strength of materials (basic) Module/course unit objectives C-1 Basic knowledge of timber structural engineering C-2 Basic knowledge of timber structural engineering Number of hours C-2 Basic knowledge of European Standards for timber structures Number of hours Course content divided into various forms of instruction Number of hours T-P-1 Design and detailing of glued laminated timber structure. The structure of glued laminated timber. 6 T-W-2 Types of glued laminated timber structure. 2 T-W-3 Eurocodes (general structure, Basis of structural design and design of glued laminated timber 6 T-W-4 Design of Consections subjected to combined stresses. Stability of members. 4 T-W-5 Design of Connections for glued laminated timber structures. 4 Structures). 4 15 T-W-7 Design of Connections for glued laminated timber structures. 4 T-W-4 Design of Connections for glued laminated timber structures. 4 Student workload - forms of activity Number of hours A+P-1 Design wor	lecture		W	3	30		1,0	0	,40	credit	S
Szymon (Szymon.Skibicki@zut.edu.pl), Tkacz Piotr (Piotr.Tkacz@zut.edu.pl) Prerequisites W-1 Strength of materials (basic) Module/course unit objectives C-2 Basic knowledge of timber structural engineering C-2 Basic knowledge of timber structural engineering Course content divided into various forms of instruction Number of hours Course content divided into various forms of instructure. Number of hours 7-P-1 Design and detailing of glued laminated timber structure. The structure of glued laminated timber. 6 7-W-2 Types of glued laminated timber structure. 6 7-W-3 Eurocodes (general structure. Basis of structural design and design of glued laminated timber structures). 2 7-W-4 Design of cross-sections subjected to combined stresses. Stability of members. 4 7-W-5 Design of cross-sections subjected to combined stresses. Stability of members. 4 7-W-5 Design of cross-sections subjected to combined stresses. Stability of members. 4 7-W-5 Design of cross-sections subjected to combined stresses. 4 7-W-7 Design of connections for glued laminat	Leading	teacher	Now	ak Rafał (Rafal_N	Iowak@zut.edu.	pl)					
W-1 Strength of materials (basic) Module/course unit objectives C-1 Basic knowledge of timber structural engineering C-2 Basic knowledge of European Standards for timber structures Course content divided into various forms of instruction Number of hours T-P-1 Design and detailing of glued laminated timber structure. The structure of glued laminated timber. Characteristics of glued laminated timber structure. Tarw-1 Introduction to glued laminated timber structure. The structure of glued laminated timber structure. Tarw-3 2 T-W-2 Types of glued laminated timber structure. 2 T-W-3 Eurocodes (general structure, Basis of structural design and design of glued laminated timber structures). 6 T-W-4 Design of basic glued lamined timber structures. 4 T-W-5 Design of conse-sections subjected to combined stresses. Stability of members. 4 T-W-6 Serviceability limit states in glued laminated timber structures. 4 T-W-7 Design of Connections for glued laminated timber structures. 4 Student workload - forms of activity Number of hours A-P-1 Design workshop 15 A-P-2 Individual student work 15 A-P-1 Design workshop <td< td=""><td>Other tea</td><td>achers</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>du.pl), Sk</td><td>bicki</td></td<>	Other tea	achers								du.pl), Sk	bicki
Module/course unit objectives C-1 Basic knowledge of timber structural engineering C-2 Basic knowledge of European Standards for timber structures Course content divided into various forms of instruction Number of hours T-P-1 Design and detailing of glued laminated timber structure. The structure of glued laminated timber. Characteristics of glued laminated timber structure. Types of glued laminated timber structure. Types of glued laminated timber structure. 2 T-W-2 Types of glued laminated timber structure. Basis of structural design and design of glued laminated timber structures. 6 T-W-3 Eurocodes (general structure, Basis of structural design and design of glued laminated timber structures. 6 T-W-4 Design of basic glued laminated timber structures. 4 T-W-5 Design of cross-sections subjected to combined stresses. Stability of members. 4 T-W-6 Serviceability limit states in glued laminated timber structures. 4 T-W-7 Design of Connections for glued laminated timber structures. 4 T-W-7 Design workshop 15 A-P-1 Design workshop 15 A-P-1 Participation in classes 30 Teaching methods / tools Evaluation methods (F - progressive, P - final) 30	Prerequis	isites									
C-1 Basic knowledge of timber structural engineering C-2 Basic knowledge of European Standards for timber structures Course content divided into various forms of instruction Number of hours T-P-1 Design and detailing of glued lamined timber building. 15 T-W-1 Introduction to glued laminated timber. Mechanical and technological properties. 6 T-W-2 Types of glued laminated timber structure. 2 T-W-3 Eurocodes (general structure, Basis of structural design and design of glued laminated timber structure. 4 T-W-4 Design of basic glued lamined timber elements. 4 T-W-5 Design of consections subjected to combined stresses. Stability of members. 4 T-W-6 Serviceability limit states in glued lamined timber structures. 4 T-W-7 Design of consections for glued lamined timber structures. 4 Student workload - forms of activity Number of hours 4 A-P-1 Individual student work 15 A-P-2 Individual student work 15 A-P-1 Lectures 30 Teaching methods / tools S 15 S-1 P Written test 5-2	W-1	Streng	th of materials (ba	isic)							
C-2 Basic knowledge of European Standards for timber structures Number of hours Course content divided into various forms of instruction Number of hours T-P-1 Design and detailing of glued laminated timber structure. The structure of glued laminated timber. Characteristics of glued laminated timber structure. The structure of glued laminated timber. Characteristics of glued laminated timber structure. T-W-2 Types of glued laminated timber structure. Types of glued laminated timber structure. T-W-3 Eurocodes (general structure, Basis of structural design and design of glued laminated timber structures). 6 T-W-4 Design of basic glued laminated timber elements. T-W-5 14 4 T-W-5 Design of cross-sections subjected to combined stresses. Stability of members. T-W-6 4 Serviceability limit states in glued laminated timber structures. 4 T-W-7 Design of Connections for glued lamined timber structures. 4 Student workload - forms of activity Number of hours A-P-2 Individual student work 15 A-P-2 Individual student work 30 Teaching methods / tools 5 4 M-1 Lectures 5 M-2 Design workshop 5 S-1 P Written test 5	Module/c	course ur	nit objectives								
Course content divided into various forms of instruction Number of hours T.P.1 Design and detailing of glued laminated timber building. 15 T.W-1 Introduction to glued laminated timber structure. The structure of glued laminated timber. 6 T.W-2 Types of glued laminated timber structure. 2 T.W-3 Eurocodes (general structure, Basis of structural design and design of glued laminated timber structures). 6 T.W-4 Design of basic glued laminated timber elements. 4 T.W-5 Design of cross-sections subjected to combined stresses. Stability of members. 4 T.W-6 Serviceability limit states in glued laminated timber structures. 4 T.W-7 Design of Connections for glued lamined timber structures. 4 T.W-7 Design of Connections for glued lamined timber structures. 4 Student workload - forms of activity Number of hours A-P-1 Design workshop 15 A-P-2 Individual student work 15 A-W-1 Participation in classes 30 Teaching methods / tools Ference to the structures workshop 15 S-1 P Written test Sering of therest of the structures workshop <	C-1										
T.P.1 Design and detailing of glued laminated timber building. 15 T.W.1 Introduction to glued laminated timber structure. The structure of glued laminated timber. Characteristics of glued laminated timber structure. The structure of glued laminated timber. 6 T.W.2 Types of glued laminated timber structure. 2 T.W.3 Eurocodes (general structure, Basis of structural design and design of glued laminated timber structures). 4 T.W.4 Design of cross-sections subjected to combined stresses. Stability of members. 4 T.W.4 Serviceability limit states in glued laminated timber structures. 4 T.W.4 Design of cross-sections subjected to combined stresses. Stability of members. 4 T.W.4 Design of consections for glued laminated timber structures. 4 T.W.7 Design of Connections for glued laminated timber structures. 4 T.W.7 Design of consections for glued laminated timber structures. 4 Student workload - forms of activity Number of hours 4 A.P-1 Design workshop 15 A.P-2 Individual student work 15 A.W-1 Participation in classes 30 Teaching methods / tools 5-1 P Written test <td>C-2</td> <td>Basic k</td> <td>nowledge of Euro</td> <td>pean Standards for</td> <td>timber structures</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	C-2	Basic k	nowledge of Euro	pean Standards for	timber structures						
T-W-1 Introduction to glued laminated timber structure. The structure of glued laminated timber. Characteristics of glued laminated timber structure. 6 T-W-2 Types of glued laminated timber structure. 2 T-W-3 Eurocodes (general structure, Basis of structural design and design of glued laminated timber structures). 6 T-W-4 Design of basic glued lamined timber elements. 4 T-W-5 Design of cross-sections subjected to combined stresses. Stability of members. 4 T-W-6 Serviceability limit states in glued laminated timber structures. 4 T-W-7 Design of Connections for glued laminated timber structures. 4 Student workload - forms of activity Number of hours A-P-1 Design workshop 15 A-P-2 Individual student work 15 A-P-2 Individual student work 30 Teaching methods / tools 4 M-1 Lectures 5 M-2 Design workshop 5 Evaluation methods (F - progressive, P - final) 5 S-1 P Written test S-2 P Project works Course ontent learning outcomes study endered of the elearning outcontes study <									Λ	lumber of	
1-W-1 Characteristics of glued laminated timber. Mechanical and technological properties. 0 7-W-2 Types of glued laminated timber structure. 2 7-W-3 Eurocodes (general structure, Basis of structural design and design of glued laminated timber structures). 6 7-W-4 Design of basic glued lamited timber elements. 4 7-W-5 Design of cross-sections subjected to combined stresses. Stability of members. 4 7-W-6 Serviceability limit states in glued laminated timber structures. 4 7-W-7 Design of Connections for glued laminated timber structures. 4 7-W-7 Design of Connections for glued laminated timber structures. 4 7-W-7 Design of Connections for glued laminated timber structures. 4 7-W-7 Design of Connections for glued laminated timber structures. 4 7-W-7 Design workshop 15 A-P-1 Design workshop 15 A-P-2 Individual student work 15 A-W-1 Participation in classes 30 7 Design workshop 5 P Written test 5 S-1 P Written test 5 <t< td=""><td>T-P-1</td><td>-</td><td></td><td></td><td></td><td></td><td>minated time</td><td>or</td><td></td><td></td><td>15</td></t<>	T-P-1	-					minated time	or			15
T-W-3 Eurocodes (general structure, Basis of structural design and design of glued laminated timber structures). 6 T-W-4 Design of basic glued lamited timber elements. 4 T-W-5 Design of cross-sections subjected to combined stresses. Stability of members. 4 T-W-6 Serviceability limit states in glued laminated timber structures. 4 T-W-7 Design of Connections for glued laminated timber structures. 4 T-W-7 Design of Connections for glued laminated timber structures. 4 Student workload - forms of activity Number of hours A-P-1 Design workshop 15 A-P-2 Individual student work 15 A-P-2 Individual student work 30 Teaching methods / tools 4 W-2 Design workshop 30 Teaching methods (F - progressive, P - final) 5 S-1 P Written test 5 S-2 P Project works 1 Teaching outcomes Reference to the learning outcomes designed for the fields of study fields	T-W-1	Charac	teristics of glued l	aminated timber. N				er.			6
1-W-3 structures). 0 7-W-4 Design of basic glued lamited timber elements. 4 7-W-5 Design of cross-sections subjected to combined stresses. Stability of members. 4 7-W-6 Service-ability limit states in glued laminated timber structures. 4 7-W-7 Design of Connections for glued laminated timber structures. 4 7-W-7 Design of Connections for glued laminated timber structures. 4 7-W-7 Design of Connections for glued lamined timber structures. 4 7-W-7 Design of Connections for glued lamined timber structures. 4 7-W-7 Design of Connections for glued lamined timber structures. 4 7-W-7 Design workshop 15 A-P-1 Design workshop 15 A-P-2 Individual student work 15 A-W-1 Participation in classes 30 7 Teaching methods / tools 5 M-2 Design workshop 5 Evaluation methods (F - progressive, P - final) 5 S-1 P Written test S-2 P Project works Reference to the learning outcomes study study Besigned learning outcomes study Reference to the learning outcome study Besigned for the fields of study </td <td>T-W-2</td> <td></td> <td>0</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>2</td>	T-W-2		0								2
T-W-5 Design of cross-sections subjected to combined stresses. Stability of members. 4 T-W-6 Servic=ability limit states in glued laminated timber structures. 4 T-W-7 Design of Connections for glued lamined timber structures. 4 T-W-7 Design of Connections for glued lamined timber structures. 4 Student workload - forms of activity Number of hours A-P-1 Design workshop 15 A-P-2 Individual student work 15 A-P-2 Individual student work 15 A-W-1 Participation in classes 30 Teaching methods / tools 5 M-2 Design workshop 30 Teaching methods (F - progressive, P - final) 5 S-2 P Project works S-2 P Project works S-2 P Project works Course of learning outcomes study of the fields of the fields of the field of t	T-W-3			ture, Basis of struc	ctural design and c	lesign of glue	ed laminated	timber			6
T-W-6 Serviceability limit states in glued laminated timber structures. 4 T-W-7 Design of Connections for glued lamined timber structures. 4 Student workload - forms of activity Number of hours A-P-1 Design workshop 15 A-P-2 Individual student work 15 A-W-1 Participation in classes 30 Teaching methods / tools 30 Teaching methods / tools 5 M-2 Design workshop 30 Student methods / tools 5 M-2 Design workshop 5 Student methods (F - progressive, P - final) 5 S-1 P Written test S-2 P Project works Image of the fields of study Designed learning outcomes study fields of study fields of interest study fields of int	T-W-4	Design	of basic glued lar	nited timber eleme	ents.						4
T-W-7 Design of Connections for glued lamined timber structures. 4 Student workload - forms of activity Number of hours A-P-1 Design workshop 15 A-P-2 Individual student work 15 A-P-2 Individual student work 30 Teaching methods / tools 30 Teaching methods / tools 4 M-1 Lectures M-2 Design workshop Evaluation methods (F - progressive, P - final) S-1 P S-1 P Vritten test 5 S-2 P Project works Image outcomes designed to the fields of study works Designed learning outcomes Reference to the learning outcomes study of the fields of study works Course content defined for the particulares of education	T-W-5	-		-			ibers.				
Student workload - forms of activity Number of hours A-P-1 Design workshop 15 A-P-2 Individual student work 15 A-P-2 Individual student work 15 A-W-1 Participation in classes 30 Teaching methods / tools 30 M-1 Lectures 400 M-2 Design workshop 50 Evaluation methods (F - progressive, P - final) 5 S-1 P Written test S-2 P Project works Evaluation methods (F - progressive, P - final) 5 S-1 P Written test S-2 P Project works Evaluation methods (F - progressive, P - final) 5 S-2 P Project works Evaluation methods (F - progressive, P - final) 5 S-2 P Project works Evaluation methods (F - progressive, P - final) 5 S-2 P Project works Evaluation methods (F - progressive, P - final) 5 S-2 P Project works Evaluation methods (F -			-			S.					
A-P-1 Design workshop 15 A-P-2 Individual student work 15 A-P-2 Individual student work 15 A-W-1 Participation in classes 30 Teaching methods / tools 30 M-1 Lectures M-2 Design workshop Evaluation methods (F - progressive, P - final) S-1 P S-1 P S-2 P Project works Besigned learning outcomes Reference to the designed for the fields of study fields of study Besigned learning outcomes References of education degree of "inzynier" Course content Teaching Evaluation methods		_		-	nber structures.						
A-P-2 Individual student work 15 A-W-1 Participation in classes 30 Teaching methods / tools 30 M-1 Lectures M-2 Design workshop Evaluation methods / F - progressive, P - final) S-1 P S-2 P Project works Reference to the learning outcomes disgned for the fields of study learning outcomes study Reference to the learning outcomes Reference to the learning outcomes disgned for the fields of study learning outcomes Course content Teaching Evaluation methods				rity					^	lumber of	
A-W-1 Participation in classes 30 Teaching methods / tools M-1 Lectures M-2 Design workshop Evaluation methods (F - progressive, P - final) S-1 P S-2 P Project works Reference to the learning outcomes study Besigned learning outcomes Reference to the study for the fields of study Segreed for the fields of study Reference to the gere of "inżynier" Course content Teaching Evaluation methods (Four content)			•								-
Teaching methods / tools M-1 Lectures M-2 Design workshop Evaluation methods (F - progressive, P - final) S-1 P Written test S-2 P Project works Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes defined for the grate of "inzynier" Course content Teaching methods Evaluation methods											_
M-1 Lectures M-2 Design workshop Evaluation methods (F - progressive, P - final) 5-1 P Written test 5-2 P Project works Reference to the learning outcomes designed for the fields of study so dudged for the fields of study Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed of the fields of study Reference to the learning outcomes designed of the fields of study Reference to the learning outcomes designed of the fields of study Reference to the learning outcomes designed of the fields of study Course content Teaching methods Evaluation methods		-									
M-2 Design workshop Evaluation methods (F - progressive, P - final) S-1 P Written test 5-2 P Project works Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of study Course output Teaching methods Evaluation methods	-	-									
S-1 P Written test S-2 P Project works Designed learning outcomes Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes defined for the particular areas of education Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of study Course content Teaching methods Evaluation methods	M-2		-								
S-1 P Written test S-2 P Project works Designed learning outcomes Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes defined for the particular areas of education Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes designed for the fields of study Course content Teaching methods Evaluation methods	Evaluatio		•	ive, P - final)							
Designed learning outcomes Reference to the learning outcomes designed for the fields of study Reference to the learning outcomes defined for the particular areas of education Reference to the learning outcomes defined for the particular areas of education Reference to the learning outcomes defined for the particular areas of education Reference to the learning outcomes defined for the particular areas of education Reference to the learning outcomes defined for the particular areas of education Course content Teaching methods Evaluation	S-1										
Designed learning outcomes designed for the fields of study study	5-2	Р	Project works								
Knowledge		Desigr	ned learning out	comes	learning outcomes designed for the fields of	learning outcomes defined for the particular areas of	learning outcomes leading to the		Course conte		
	Knowled	lge					I	1			

B-A_2A_ES/D/15_W01 Student knows European Standards for timber structures	B-A_2A_W08 B-A_2A_W10 B-A_2A_W11 B-A_2A_W13	P7S_WG_TA21	P7S_WG_IA21	C-1 C-2	T-P-1 T-W-1 T-W-2 T-W-3	T-W-5 T-W-6 T-W-7	M-1	S-1
Skills								
B-A_2A_ES/D/15_U01 Student can set up the loading acting on structure according to European Standards. Student can design of glued lamined timber structure.	B-A_2A_U01 B-A_2A_U21 B-A_2A_U25	P7S_UK P7S_UW_TA22 P7S_UW_TA23 P7S_UW_TA24		C-1 C-2	T-P-1 T-W-1 T-W-2 T-W-3	T-W-4 T-W-5 T-W-6 T-W-7	M-2	S-2
Other social / personal competences								
B-A_2A_ES/D/15_K01 Student understand rule of design of glued lamined timber structures.	B-A_2A_K04 B-A_2A_K06	P7S_KK P7S_KR		C-1 C-2	T-P-1 T-W-1 T-W-2 T-W-3	T-W-4 T-W-5 T-W-6 T-W-7	M-1 M-2	S-1 S-2
Required reading								
1. Ozelton, E.C., Baird, J. A., Timber Designers' Manual, B	lackwell Publisł	ning, 2006						
2. Porteous, J., Kermani, A., Structural Timber Design to I	Eurocode 5, Bla	ckwell Publishi	ng, 2007					
3. EN 1990: Eurocode - Basis of structural design, 2011								
4. Eurocode 1: Actions of structures, parts: EN 1991-1-1;	EN 1991-1-3; E	N 1991-1-4, 20)11					
5. EN 19951-1: Eurocode 5: Design of timber structures,	2011							
Supplementary reading								
1. Hugues, T., Steiger L., Weber, J., Timber Construction.	Details. Produc	ts. Case studie	es., 2011					

Field of s							
	study	Civil E	Engineering				
Mode of	⁻ study	statio	nary	Level	second cycle		
Graduate	e's qualification	magis	ster	-1		WBiA	
Area(s)	of study	nauki	techniczne			vvD1/	\
	onal profile	gener	ral academic				
Module		- J				- 1 11	
Course u	unit	Theo	ry of Construe	ctions		-	
Code		_	/S2CE/ICM/D/01			- 1 11	
		-				- \	
	specialisation	_		uction Managemer	IC	- \	
	tering faculty	-	d Teorii Konstru	-			
ECTS		3,0		ECTS (forms)	3,0		
Form of	course credit	credit	S	Language	english		
Electives	S			Elective group			
Form of	instruction	Code	Semester	Hours	ECTS	Weight	Credit
laborato	ory course	L	1	15	1,0	0,34	credits
project c	course	Р	1	15	1,0	0,33	credits
lecture		W	1	15	1,0	0,33	credits
Leading	teacher	Wehe	r Hanna (Hanna	 a.Weber@zut.edu.	nl)		
Other te		WEBE					
Uner le	achers						
Prerequi W-1	Mathematics						
W-1 W-2	Mathematics Physics	 					
W-1 W-2 W-3	Mathematics Physics Structural Mechar						
W-1 W-2 W-3 W-4	Mathematics Physics Structural Mechar Numerical Methoc	s					
W-1 W-2 W-3 W-4 Module/d	Mathematics Physics Structural Mechar Numerical Methoc	ls /es					
W-1 W-2 W-3 W-4 Module/o C-1	Mathematics Physics Structural Mechar Numerical Methoc Course unit objectiv Knowledge in the	ls <i>/es</i> field of S		states of continuous l			
W-1 W-2 W-3 W-4 Module/o C-1 C-2	Mathematics Physics Structural Mechar Numerical Methoc Course unit objectiv Knowledge in the Ability to construct	ls <i>ves</i> field of S t influen	ice lines and mon	nent envelope in cor			
W-1 W-2 W-3 W-4 Module/o C-1 C-2 C-3	Mathematics Physics Structural Mechan Numerical Method Course unit objective Knowledge in the Ability to construct Ability to consider	ls /es field of S t influen the bea	ice lines and mon ms on flexible gro	nent envelope in cor ound.			
W-1 W-2 W-3 W-4 Module/c C-1 C-2 C-3 C-4	Mathematics Physics Structural Mechar Numerical Method Course unit objective Knowledge in the Ability to consider Ability to consider Ability to consider	ls /es field of S t influen the bea Statics	ice lines and mon ms on flexible gro of cables and cha	nent envelope in cor ound. ains.			
W-1 W-2 W-3 W-4 Module/o C-1 C-2 C-3 C-3 C-4 C-5	Mathematics Physics Structural Mechar Numerical Method Course unit objective Knowledge in the Ability to consider Ability to consider Ability to solve the	field of S t influen the bea Statics e probler	ice lines and mon ms on flexible gro of cables and cha ms of limit states	nent envelope in cor ound. ains. of bar systems.			
W-1 W-2 W-3 W-4 Module/o C-1 C-2 C-3 C-4 C-4 C-5 Course c	Mathematics Physics Structural Mechar Numerical Method Course unit objective Knowledge in the Ability to construct Ability to consider Ability to consider Ability to solve the Content divided into	ls /es field of S t influen the bea Statics e probler o variou	ice lines and mon ms on flexible gro of cables and cha ms of limit states	nent envelope in cor ound. ains. of bar systems.			Number of hours
W-1 W-2 W-3 W-4 Module/c C-1 C-2 C-3 C-4 C-5 Course c T-L-1	Mathematics Physics Structural Mechan Numerical Method Course unit objective Knowledge in the Ability to construct Ability to consider Ability to solve the content divided into Plane state of street	ls field of S t influen the bea Statics probler variou	ice lines and mon ms on flexible gro of cables and cha ms of limit states is forms of instr	nent envelope in cor ound. ains. of bar systems.			3
W-1 W-2 W-3 W-4 Module/o C-1 C-2 C-3 C-4 C-5 Course o T-L-1 T-L-2	Mathematics Physics Structural Mechar Numerical Method Course unit objective Knowledge in the Ability to consider Ability to consider Ability to solve the content divided into Plane state of stree Torsion of thin-wa	ls field of S t influen the bea Statics probler variou ss lled cros	ice lines and mon ms on flexible gro of cables and cha ms of limit states is forms of instr	nent envelope in cor ound. ains. of bar systems.			3
W-1 W-2 W-3 W-4 Module/o C-1 C-2 C-3 C-4 C-5 Course o T-L-1 T-L-2 T-L-3	Mathematics Physics Structural Mechar Numerical Method Course unit objective Knowledge in the Ability to construct Ability to consider Ability to consider Ability to solve the Content divided into Plane state of street Torsion of thin-wa Observation and version	ls field of S t influen the bea Statics e probler o variou ss lled cros risualizat	ice lines and mon ms on flexible gro of cables and cha ms of limit states is forms of instr	nent envelope in cor ound. ains. of bar systems.			3 3 3
W-1 W-2 W-3 W-4 Module/o C-1 C-2 C-3 C-4 C-5 Course c T-L-1 T-L-2 T-L-3 T-L-3 T-L-4	Mathematics Physics Structural Mechan Numerical Method Course unit objective Knowledge in the Ability to construct Ability to consider Ability to consider Ability to solve the Content divided into Plane state of stree Torsion of thin-wa Observation and version Elastic buckling of	is field of S t influen the bea Statics probler variou ss lled cros risualizat	ice lines and mon ms on flexible gro of cables and cha ms of limit states is forms of instr ss-section tion of vibrations	nent envelope in cor ound. ains. of bar systems.			3 3 3 2
W-1 W-2 W-3 W-4 Module/C C-1 C-2 C-3 C-4 C-5 Course C T-L-1 T-L-2 T-L-3 T-L-3 T-L-4 T-L-5	Mathematics Physics Structural Mechar Numerical Method Course unit objection Knowledge in the Ability to construct Ability to consider Ability to consider Ability to solve the Content divided into Plane state of street Torsion of thin-wa Observation and wa Elastic buckling of Influence lines of wate	ls field of S t influen the bea Statics probler Ss lled cros risualizat	ice lines and mon ms on flexible gro of cables and cha ms of limit states as forms of instr ss-section tion of vibrations	nent envelope in cor ound. ains. of bar systems. ruction			3 3 3 2 2
W-1 W-2 W-3 W-4 Module/o C-1 C-2 C-3 C-4 C-5 Course o T-L-1 T-L-2 T-L-3 T-L-3 T-L-4 T-L-5 T-L-6	Mathematics Physics Structural Mechar Numerical Method Course unit objective Knowledge in the Ability to construct Ability to consider Ability to consider Ability to solve the Content divided into Plane state of street Torsion of thin-wa Observation and ve Elastic buckling of Influence lines of of Stretching of non-	ls field of S t influen the bea Statics Statics probler o variou ss lled cros risualizat bar continuo symmet	ice lines and mon ms on flexible gro of cables and cha ms of limit states is forms of instr ss-section tion of vibrations us beam. rical thin-walled o	nent envelope in cor ound. ains. of bar systems. ruction			3 3 2 2 2 2
W-1 W-2 W-3 W-4 Module/o C-1 C-2 C-3 C-4 C-5 Course o T-L-1 T-L-2 T-L-3 T-L-4 T-L-5 T-L-6 T-P-1	Mathematics Physics Structural Mechan Numerical Method Course unit objective Knowledge in the Ability to construct Ability to consider Ability to consider Ability to solve the Content divided into Plane state of street Torsion of thin-wa Observation and version Elastic buckling of Influence lines of of Influence lines of of	ls field of S t influen the bea Statics probler variou ss lled cros risualizat bar continuo symmet continuo	ice lines and mon ms on flexible gro of cables and cha ms of limit states is forms of instr ss-section tion of vibrations us beam. rical thin-walled o us beams.	nent envelope in cor ound. ains. of bar systems. ruction			3 3 2 2 2 2 5
W-1 W-2 W-3 W-4 Module/C C-1 C-2 C-3 C-4 C-5 Course C T-L-1 T-L-2 T-L-3 T-L-4 T-L-5 T-L-6 T-P-1 T-P-2	Mathematics Physics Structural Mechar Numerical Method Course unit objective Knowledge in the Ability to construct Ability to consider Ability to consider Ability to solve the Content divided into Plane state of street Torsion of thin-wa Observation and ve Elastic buckling of Influence lines of of Stretching of non-	ls field of S t influen the bea Statics probler Statics probler visualizat bar continuo symmet continuo ground.	ice lines and mon ms on flexible gro of cables and cha ms of limit states is forms of instr ss-section tion of vibrations bus beam. rical thin-walled of rus beams.	nent envelope in cor ound. ains. of bar systems. ruction			3 3 2 2 2 2 5 5 5
W-1 W-2 W-3 W-4 Module/o C-1 C-2 C-3 C-4 C-5 Course o T-L-1 T-L-2 T-L-3 T-L-4 T-L-5 T-L-6 T-P-1 T-P-2 T-P-3	Mathematics Physics Structural Mechar Numerical Method Course unit objective Knowledge in the Ability to construct Ability to consider Ability to consider Ability to solve the Content divided into Plane state of street Torsion of thin-wa Observation and vertex Elastic buckling of Influence lines of of Stretching of non- Influence lines of of Beams on flexible	ls field of S t influen the bea Statics probler variou ss lled cros risualizat bar continuo symmet continuo ground. ams and	ice lines and mon ms on flexible gro of cables and cha ms of limit states is forms of instr ss-section tion of vibrations us beam. rical thin-walled o pus beams. frames	nent envelope in cor ound. ains. of bar systems. <i>ruction</i> cross-section			3 3 2 2 2 2 5
W-1 W-2 W-3 W-4 Module/o C-1 C-2 C-3 C-4 C-5 Course o T-L-1 T-L-2 T-L-3 T-L-3 T-L-4 T-L-5 T-L-6	Mathematics Physics Structural Mechar Numerical Method Course unit objective Knowledge in the Ability to construct Ability to consider Ability to consider Ability to solve the Content divided into Plane state of street Torsion of thin-wa Observation and ve Elastic buckling of Influence lines of ve Beams on flexible Limit states of beams	Is field of S t influen the bea Statics probler variou ss lled cros risualizat bar continuo symmet continuo ground. ams and ate conti	ice lines and mon ms on flexible gro of cables and cha ms of limit states is forms of instr ss-section tion of vibrations us beam. rical thin-walled o pus beams. frames	nent envelope in cor ound. ains. of bar systems. <i>ruction</i> cross-section			3 3 2 2 2 2 5 5 5 5
W-1 W-2 W-3 W-4 Module/C C-1 C-2 C-3 C-4 C-5 Course C T-L-1 T-L-2 T-L-3 T-L-3 T-L-4 T-L-5 T-L-6 T-P-1 T-P-2 T-P-3 T-W-1	Mathematics Physics Structural Mechan Numerical Method Course unit objection Knowledge in the Ability to consider Ability to consider Ability to consider Ability to solve the content divided into Plane state of stree Torsion of thin-wa Observation and wa Elastic buckling of Influence lines of way Beams on flexible Limit states of beat Stratic indeterminal	ls field of S t influen the bea Statics probler variou ss lled cros visualizat bar continuo symmet continuo ground. ams and ate conti	ice lines and mon ms on flexible gro of cables and cha ms of limit states is forms of instr ss-section tion of vibrations us beam. rical thin-walled o pus beams. frames	nent envelope in cor ound. ains. of bar systems. <i>ruction</i> cross-section			3 3 2 2 2 2 5 5 5 3
W-1 W-2 W-3 W-4 Module/o C-1 C-2 C-3 C-4 C-5 Course o T-L-1 T-L-2 T-L-3 T-L-4 T-L-5 T-L-6 T-P-1 T-P-2 T-P-3 T-W-1 T-W-2	Mathematics Physics Structural Mechan Numerical Method Course unit objective Knowledge in the Ability to consider Ability to consider Ability to consider Ability to solve the Content divided into Plane state of stree Torsion of thin-wa Observation and w Elastic buckling of Influence lines of w Stretching of non- Influence lines of w Beams on flexible Limit states of bea Static indetermina Cables and chains	Is field of S t influen the bea Statics probler variou ss lled cros risualizat bar continuo symmet continuo ground. ams and ate conti	ice lines and mon ms on flexible gro of cables and cha ms of limit states is forms of instr ss-section tion of vibrations us beam. rical thin-walled of us beams. frames nuous beams, inf	nent envelope in cor ound. ains. of bar systems. <i>ruction</i> cross-section			3 3 2 2 2 2 2 5 5 5 5 3 3 2
W-1 W-2 W-3 W-4 Module/o C-1 C-2 C-3 C-4 C-5 Course o T-L-1 T-L-2 T-L-3 T-L-3 T-L-4 T-L-5 T-L-6 T-P-1 T-P-2 T-P-3 T-P-3 T-W-1 T-W-2 T-W-3 T-W-4	Mathematics Physics Structural Mechan Numerical Method Course unit objective Knowledge in the Ability to construct Ability to consider Ability to consider Ability to solve the Content divided into Plane state of stree Torsion of thin-wa Observation and version Elastic buckling of Influence lines of of Stretching of non- Influence lines of of Static indetermina Cables and chains Beams on flexible Limit states of beams Influence lines of of	Is ves field of S t influen the bea Statics e probler o variou iss Iled cros visualizat bar continuo ground. ams and ams and ams and	ice lines and mon ms on flexible gro of cables and cha ms of limit states is forms of instr is-section tion of vibrations us beam. rical thin-walled of bus beams. frames nuous beams, inf frames	nent envelope in cor ound. ains. of bar systems. <i>ruction</i> cross-section			3 3 2 2 2 2 2 5 5 5 5 3 3 2 4 6
W-1 W-2 W-3 W-4 Module/o C-1 C-2 C-3 C-4 C-5 Course o T-L-1 T-L-2 T-L-3 T-L-3 T-L-4 T-L-5 T-L-6 T-P-1 T-P-2 T-P-3 T-P-3 T-W-1 T-W-2 T-W-3 T-W-4	Mathematics Physics Structural Mechar Numerical Method Course unit objective Knowledge in the Ability to construct Ability to consider Ability to consider Ability to solve the Content divided into Plane state of street Torsion of thin-wa Observation and ve Elastic buckling of Influence lines of ve Stretching of non- Influence lines of ve Static indetermina Cables and chains Beams on flexible Limit states of beams Beams on flexible Limit states of beams	Is field of S t influen the bea Statics probler variou ss lled cros risualizat bar continuo ground. ams and ate conti ground ams and f activit	ice lines and mon ms on flexible gro of cables and cha ms of limit states is forms of instr is-section tion of vibrations us beam. rical thin-walled of us beams. frames nuous beams, inf frames	nent envelope in cor ound. ains. of bar systems. <i>ruction</i> cross-section			3 3 2 2 2 2 5 5 5 5 3 3 2 4
W-1 W-2 W-3 W-4 Module/a C-1 C-2 C-3 C-4 C-5 Course c T-L-1 T-L-2 T-L-3 T-L-3 T-L-4 T-L-5 T-L-6 T-P-1 T-P-2 T-P-3 T-P-3 T-W-1 T-W-2 T-W-2 T-W-2 T-W-3 T-W-4 Student	Mathematics Physics Structural Mechan Numerical Method Course unit objective Knowledge in the Ability to construct Ability to consider Ability to consider Ability to solve the Content divided into Plane state of stree Torsion of thin-wa Observation and version Elastic buckling of Influence lines of of Stretching of non- Influence lines of of Static indetermina Cables and chains Beams on flexible Limit states of beams Influence lines of of	Is field of S t influen the bea Statics probler Statics probler Statics probler Statics probler Statics probler Statics Static	ice lines and mon ms on flexible gro of cables and cha ms of limit states is forms of instr ss-section tion of vibrations us beam. rical thin-walled of us beams. frames nuous beams, inf frames	nent envelope in cor ound. ains. of bar systems. <i>ruction</i> cross-section			3 3 3 2 2 2 2 2 5 5 5 5 3 3 2 2 4 6 <i>Number of hours</i>
W-1 W-2 W-3 W-4 Module/C C-1 C-2 C-3 C-4 C-5 Course C T-L-1 T-L-2 T-L-3 T-L-3 T-L-4 T-L-5 T-L-6 T-P-1 T-P-2 T-P-1 T-P-2 T-P-3 T-W-1 T-W-2 T-W-3 T-W-2 T-W-3 T-W-3 Student A-L-1	Mathematics Physics Structural Mechan Numerical Method Course unit objection Knowledge in the Ability to consider Ability to consider Ability to consider Ability to solve the Content divided into Plane state of stree Torsion of thin-wa Observation and w Elastic buckling of Influence lines of of Stretching of non- Influence lines of of Static indetermina Cables and chains Beams on flexible Limit states of bea Workload - forms of Attending the labor	Is ves field of S t influen the bea Statics e probler o variou iss Iled cros visualizat bar continuo ground. ams and ite conti ground ams and f activit pratory c poratory c	ice lines and mon ms on flexible gro of cables and cha ms of limit states is forms of instr is-section tion of vibrations us beam. rical thin-walled of bus beams. frames nuous beams, inf frames ty lasses. classes	nent envelope in cor ound. ains. of bar systems. <i>ruction</i> cross-section			3 3 3 2 2 2 2 2 5 5 5 5 5 3 2 2 4 6 2 3 3 2 1 5 5 3 3 1 5 5 3 1 5 5 5 5 5 5 5 5 5 5

Student v	workloa	d - forms of activity						Nun	nber of	hours
A-P-3	Execu	tion of project assignment								10
A-W-1	Attend	ling the lectures.								15
A-W-2	Studyi	ng/revision for the final exam.								13
A-W-3	Partici	pation in the exam.								2
Teaching	n metho	ds / tools								
M-1	Lectur	e								
M-2	Projec	t class								
M-3	Labora	atory class								
Evaluatio	on meth	ods (F - progressive, P - final)								
S-1	Р	Written exam								
S-2	F	Assesment of project assignment								
S-3	F	Assesment during the laboratory cla	isses							
	Desig	ned learning outcomes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Cours	e content	Teaching methods	Evaluation methods
Knowledg	ge		1							1
	ows how to	o create numerical models for static stems with permanent and live loads.	B-A_2A_W05	P7S_WG_TA21	P7S_WG_IA21	C-1	T-W-1 T-W-2	T-W-3 T-W-4	M-1	S-1
Skills		· · · · · · · · · · · · · · · · · · ·								
	able to cre	ate numerical and measuring models in addressed problem	B-A_2A_U19	P7S_UW_TA24		C-2 C-3 C-4 C-5	T-L-1 T-L-2 T-L-3 T-L-4 T-L-5 T-L-6 T-P-1	T-P-2 T-P-3 T-W-1 T-W-2 T-W-3 T-W-4	M-1 M-2 M-3	S-1 S-2 S-3
Other so	cial / pe	rsonal competences								
CE_2A_CE/C Student is a		esponsibility for his computation	B-A_2A_K02	Р75_КК		C-2 C-3 C-4 C-5	T-P-1 T-P-2 T-P-3 T-W-1	T-W-2 T-W-3 T-W-4	M-1 M-2	S-1 S-2
Required	l reading	9	·			•			·	<u> </u>
-		, c, Chia-Ming Uang, Anne Μ. Gilbert, Fι	Indamentals of S	tructural Anal	ysis, McGraw-	Hill, 201	L1, Fou	rth editi	on	
		n, Elements of the theory of Structure								

			=	_	_		
Field of s	study	Civil E	Ingineering				
Mode of	study	statio	nary	Level	second cycle		
Graduate	e's qualification	magis	ster			WBi/	Δ
Area(s) c	of study	nauki	techniczne				`
Educatio	nal profile	gener	al academic				
Module							
Course u	ınit	Com	outer Aided De	esian-1		- 1 1	
Code		-	/S2CE/A/D/08-1			- 1 1	
	specialisation	_		ction Managemen	t	- \	
	tering faculty	-	ra Dróg i Mostó	-	<u> </u>		
ECTS		2,0		ECTS (forms)	2,0	1	
	course credit	credit	<u> </u>				
		creait	5	Language	english		
Electives				Elective group			
	instruction	Code	Semester	Hours	ECTS	Weight	Credit
project c	ourse	Р	2	30	1,0	0,50	credits
lecture		W	2	15	1,0	0,50	credits
Leading	teacher	Czarn	ecki Jacek (Jace	k.Czarnecki@zut.	edu.pl)		
Other tea	achers	Kacpr	zak Dominik (D	ominik.Kacprzak@	zut.edu.pl)		
Prerequis	sites	-					
W-1	Computer skills						
Module/c	course unit objectiv	es					
C-1			es of CAD design	in civil engineering			
Course c	ontent divided into						Number of hours
T-P-1	Introductioin to pro						2
T-P-2		-		g the map symbols			2
Т-Р-3	Project of the road	-			plan, longitudinal prof	ile, cross	26
T-W-1	sections)	Devetor	ns history of CAP) software in civil en	aineerina		2
T-W-2	Types of CAD softw		ns, mstory of CAL		gineering		1
T-W-3			meters regarding	to road design with	the use of CAD softwa	re	2
T-W-4	Types of maps in r	-		<u> </u>			1
T-W-5	Terrain model		-				1
T-W-6	Layout plan						2
T-W-7	Longitudinal profile	5					2
T-W-8	Cross sections						2
T-W-9	Traffic signing and	road m	arking				2
Student	workload - forms of	f activit	<u>у</u>				Number of hours
A-P-1	Workshops						30
A-W-1	Lectures						15
	the attraction of the second second						10
A-W-2	Individual learning						
A-W-3	Preparing for the g						4
	-						4
A-W-3 A-W-4 Teaching	Preparing for the g						
A-W-3 A-W-4 Teaching M-1	Preparing for the g Grade g methods / tools Lecture						
A-W-3 A-W-4 Teaching	Preparing for the g Grade g methods / tools						
A-W-3 A-W-4 Teaching M-1 M-2	Preparing for the g Grade g methods / tools Lecture	irade	re, P - final)				
A-W-3 A-W-4 Teaching M-1 M-2	Preparing for the g Grade g methods / tools Lecture Workshop	gressiv	re, P - final)				

Designed learning outcomes	ing outcomes Reference to the learning outcomes designed for the fields of study education		Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course	Course content		Evaluation methods
Knowledge		1	I					
B-A_2A_A/C/08-1_W01 Student knows the basic principles of road design in CAD software. Knows the basic principles of creating and printing road drawings using the CAD software.	B-A_2A_W09	P75_WG_TA21	P75_WG_IA21	C-1	T-P-1 T-P-2 T-P-3 T-W-1 T-W-2 T-W-3	T-W-5 T-W-6 T-W-7 T-W-8 T-W-9	M-1 M-2	S-1 S-2
Skills								
B-A_2A_A/C/08-1_U01 Student can design a road section in CAD software. Can read surveying maps and construction drawings.	B-A_2A_U08	P7S_UW_TA24	P7S_UW_IA24	C-1	T-P-2 T-P-3 T-W-3 T-W-4	T-W-6 T-W-7 T-W-8 T-W-9	M-1 M-2	S-2
Other social / personal competences	1	ŀ	1				1	1
B-A_2A_A/C/08-1_K01 Student understands the responsibility for the consequences of engineering activity and its impact on the environment.	B-A_2A_K03	Р75_КК		C-1	T-P-2 T-P-3 T-W-3 T-W-5	T-W-6 T-W-7 T-W-8 T-W-9	M-1 M-2	S-1 S-2
Required reading		•						
1. Brian C. Benton, George Omura, Mastering AutoCAD 2	018 and AutoCA	D LT 2018, Sy	/bex, 2017					
Supplementary reading								
1. https://www.mycadsite.com, 2018								

			-	_	_						
Field of s	tudy	Civil E	Engineering								
Mode of s	study	statio	nary	Level	second	cycle					
Graduate	's qualification	magis	ster	1			V	VBi/	7		
Area(s) o		nauki	techniczne				v	V DIA	1		
	nal profile		ral academic				1 F				
Module		gene					11	- 11			
Course ui	nit	Cost	Management	in Constructio	n -2			- 11	П		
			•		-2		1 I.	- 11		Шп	
Code	. ,. ,.	_	/S2CE/ICM/D/09				1	- 11			
Field of s	pecialisation			Iction Managem							
	ering faculty	Budo	wnictwie	Ekonomiki, Orga	-	rząuzania w					
ECTS		2,0		ECTS (forms)	2,0		_				
Form of c	ourse credit	credit	ts	Language	english						
Electives				Elective group							
Form of i	nstruction	Code	Semester	Hours		ECTS	We	eight		Credit	t
project co	ourse	Р	2	15		1,0	0	,50		credit	s
lecture		w	2	15		1,0		,50		credit	s
Leading t	eacher			A (Magdalena.Bo	chenek@zi			,			
Other tea		DOCIN			Chenek@20	ic.euu.pi)					
Prerequis											
W-1	Basic knowledge	of constr	ruction technology	/ and construction	materials						
	ourse unit objecti										
C-1	Upon completion	of this co	ourse the student	will be able to ma	anage the cor	nstruction cost	t effect	ively and	ассоц	untably	
Course co	ontent divided int	o variou	is forms of instr	uction					Num	ber of	hours
T-P-1	Cost managemer	nt using s	oftware								15
T-W-1	Introduction to in	ternation	al cost managem	ent							1
T-W-2	International best	t practice	25								2
T-W-3			cost managemen	t							3
T-W-4	Managing risks w	ithin the	project cost								3
T-W-5	Value manageme										3
T-W-6	Cost control and	monitorir	ng procedures								3
Student v	vorkload - forms o		ty						Num	ber of	hours
A-P-1	Class Participatio										15
A-P-2	Exercise preparat										15
A-W-1	Class Participatio										15
A-W-2		-	ecture content and	d literature recogr	nition						7
A-W-3	Preparation for th	ie exam									7
A-W-4	Final exam										1
-	methods / tools										
M-1	Lecture, case stu	dies									
Evaluatio	n methods (F - pr	-									
	F continuou	s assessi	ment								
S-1		am									
	P written ex	ann									
S-1	P written ex Designed learni		omes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course co	ontent	Teaching methods	Evaluatior methods
S-1	Designed learni		omes	learning outcomes designed for the fields of	learning outcomes defined for the particular areas of	learning outcomes leading to the		Course co	ontent	Teaching methods	

Skills							
CE_2A_CE/D/18_U01 Student is able to: analyse and control the cost for various cases.	B-A_2A_U24	P7S_UW_TA22	C-1	T-P-1 T-W-1 T-W-2 T-W-3	T-W-4 T-W-5 T-W-6	M-1	S-1 S-2
Other social / personal competences							
CE_2A_CE/D/18_K01 Student is able in both professional and responsible way use gained knowledge and skills in executions works associated with cost management.	B-A_2A_K05	P75_KO	C-1	T-P-1 T-W-1 T-W-2 T-W-3	T-W-4 T-W-5 T-W-6	M-1	S-1 S-2
Required reading							
1. K. Potts, N.Ankrah, Construction cost management, Ro	utledge, 2017						

Field of st	udy	Civil E	Engineering				
Mode of s	tudy	statio	nary	Level	second cycle		
Graduate'	s qualification	magis	ster		- I	WBi/	7
Area(s) of	study	nauki	techniczne			vv Di/	1
Education	-	aenei	ral academic				
Module		9					
Course un	nit	Socia	al Aspects in I	nternational Co	nstruction Industry		
Code			/S2CE/ICM/D/02		isciaction mausery		
	pecialisation			Joction Managemer			
· · ·					izacji i Zarządzania w		
Administe	ering faculty		wnictwie				
ECTS		2,0		ECTS (forms)	2,0		
Form of co	ourse credit	credit	S	Language	english		
Electives				Elective group		-	
Form of in	struction	Code	Semester	Hours	ECTS	Weight	Credit
lecturing	course	Α	1	15	1,0	0,50	credits
lecture		w	1	15	1,0	0,50	credits
Leading te	eacher	Arasz	kiewicz Krystyr	 a (Krystyna Δrasz	kiewicz@zut.edu.pl)		<u> </u>
Other tea		7 11 032	Rewiez Riyseyi				
Prerequisi W-1	knowledge of the b		f project manage	mont			
	-						
	ourse unit objectiv						
C-1 C-2		· ·		al business developr ontract documents.	ment applied to construct	ion.	
C-2 C-3				and construction ma	nagement		
C-4	To understand soci				lagement.		
	ntent divided into	•	0				Number of hours
Course co					nagement and its effect ir	a practical	Number of nours
T-A-1	environment using	a spec	ified case study.	The international pro implementation, co	pject and its characteristion	s: preparation,	6
T-A-2	-			zational culture - tea			4
T-A-3					g international projects.		4
T-A-4	completion of audi	torium	exercises	<u>_</u>	<u> </u>		1
T-W-1		ourse s	yllabus and expe	ctations. Introduction	n to International Constru	ction	1
T-W-2	(overview).	al Cons	struction Market.	Trends in Internatio	nal Construction.		1
T-W-3	International Project						2
T-W-4	Case study 1	J -					1
T-W-5	Selecting an Assoc	iate and	d Getting Along ir	n Other Cultures.			1
T-W-6	International Contr Construction Arbitr				Scope of Work. Internatio	nal	3
T-W-7	Supervisory Proble	ms in Ir	nternational Cons	truction.			1
T-W-8				ural context. Case s	tudy 2.		1
T-W-9	Multi-Project Mana	-					1
T-W-10	Globalization and s		le construction ir	ndustry			2
T-W-11	completion of lectu						1
	orkload - forms of		-				Number of hours
A-A-1	presence on the ex		:5				15
A-A-2 A-A-3	case study analysis	5					5
A-A-3 A-A-4	self-study as a hon	nowork	(case studios)				5
A-A-4	Sen-Sludy dS d 11011	IE WUIK	(case studies)				<u>ح</u>

Student v	vorkload	d - forms of activity						Num	ber of	hours
A-A-5	comple	etion of auditorium excercises								1
A-W-1	preser	ice on lectures								14
A-W-2	self - s	tudy, preparation for lectures comple	tion							14
A-W-3	analys	is of case studies								1
A-W-4	comple	etion of lectures								1
Teaching	method	ls / tools								
M-1	Lectur	e, case studies								
М-2	Project	based learning method								
Evaluatio	n meth	ods (F - progressive, P - final)								
S-1	F	test								
S-2	F	teamwork appraisal								
	Desigi	ned learning outcomes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Cours	e content	Teaching methods	Evaluation methods
Knowledg	je					ł				
	s will unde	L erstand theoretical foundations of nanagement	B-A_2A_W07 B-A_2A_W14	P7S_WG_TA21 P7S_WK_TA21	P7S_WG_IA21 P7S_WK_IA21	C-1 C-2 C-3 C-4	T-W-1 T-W-2 T-W-3 T-W-5 T-W-6	T-W-7 T-W-8 T-W-9 T-W-10	M-1 M-2	S-1 S-2
Skills			I				1. 11 0			4
important fr	is able to om the po	characterize the basic soft competences int of view of planning, implementation mational projects	B-A_2A_U01 B-A_2A_U26	P7S_UK P7S_UU		C-1 C-2 C-3 C-4	T-A-1 T-A-2 T-A-3	T-W-1 T-W-2 T-W-8	M-1 M-2	S-1 S-2
Other soc	cial / pei	rsonal competences								
assumptions	recognize of intern in the ins	es the relationship between the theoretical ational management and practical titutional structure of specific international	B-A_2A_K03	P7S_KK		C-1 C-2 C-3 C-4	T-W-1 T-W-2 T-W-3 T-W-4 T-W-5	T-W-6 T-W-7 T-W-8 T-W-9 T-W-10	M-1 M-2	S-1 S-2
Required	reading	1								
1. Köster k	Kathrin, I	nternational Project Management, SA	GE Publications L	td, London, 2	010					
2. Lientz, E	3., & Rea	, K., International project manageme	nt., Routledge., 2	2012						
Suppleme	entary r	eading								
1. Keeling,	R., Proje	ect management: An international per	rspective., Macm	illan, 2000						

Field of st	udy		Civil E	Engineering								
Mode of st	tudy		statio	nary	Level	second	cycle					
Graduate'	s qualit	fication	magis	ster				V	VBiA			
Area(s) of	study		nauki	techniczne								_
Education	al profi	le	gener	ral academic				1 Г		1C		
Module	•								- 11			
Course un	nit		Inter	national Tendo	er Manageme	nt			- 11	Ш	臣	
Code				/S2CE/ICM/D/03					- 11	Ш	ШП	
Field of sp	ocialis	ation	-	national Constru	ction Managem	ont		1	- 11	Ш		
-				ół Dydaktyczny I	-		rzadzania w			Ц.	L	
Administe	ring fac	culty		wnictwie	,							
ECTS			2,0		ECTS (forms)	2,0						
Form of co	ourse c	redit	credit	S	Language	english						
Electives					Elective group	,]				
Form of in	structio	on	Code	Semester	Hours		ECTS	We	eight		Credit	t
lecturing o			A	1	15		1,0		,50		credit	
lecture			W	1	15		1,0		,50		credit	
						chonol-O			,		ci cuit.	-
Leading te	eacner			enek Magdalena enek Magdalena	-		-	citina E	rofoccor			
Other tead	chers			ing@zut.edu.pl)	(Magualena.bo	JCHENEK@20	Lieuu.pi), vi	ыстту г	10165501			
Prerequisi	ites											
W-1	Basic k	nowledge of	f constr	uction technology	and construction	n materials						
Module/co	urse u	nit objective	<u>es</u>									
C-1	Upon c	completion o		ourse the student	will be able to ma	anage the inte	ernational ten	der proc	cess effect	ively	and	
	accour											
	_			s forms of instru	uction					Num	ber of	
T-A-1		tudies: interi										15
T-W-1				al tendering								1
T-W-2 T-W-3		ping a mode		aer process								1
T-W-3		als in tender		s								1
T-W-5	•	ational best p	•									3
T-W-6				and offer selection	n							3
T-W-7				bid and tender pro								2
T-W-8	Interna	ational Contr	act Con	ditions								2
Student w	orkload	d - forms of	activit	ťv						Num	ber of	hours
A-A-1		Participation		- ,								15
A-A-2		se preparatio	n									15
A-W-1		Participation										15
A-W-2	Indepe	ndent analy	sis of le	cture content and	l literature recogr	nition						7
A-W-3	Prepar	ation for the	exam									7
A-W-4	Final e	xam										1
Teaching	method	ls / tools										
M-1		e, case studi	es									
Evaluatior	n metho	ods (F - pro	gressiv	/e, P - final)								
5-1	F	continuous	-									
5-2	Р	written exa										
	Desigr	ned learning	g outco	omes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course cont	ent	Teaching methods	Evaluation methods

Knowledge							
CE_2A_ICM/D/02_W01 Student has the knowledge of managing the international tender process effectively and accountably.	B-A_2A_W14	P7S_WK_TA21	P7S_WK_IA21	C-1	T-W-1 T-W- T-W-2 T-W- T-W-3 T-W- T-W-4 T-W-	6 7 M-1	S-2
Skills							
CE_2A_ICM/D/02_U01 Student is able to: analyze modern tender process for various case	B-A_2A_U24	P7S_UW_TA22		C-1	T-A-1 T-W- T-W-1 T-W- T-W-2 T-W- T-W-3 T-W- T-W-4 T-W-4	6 7 M-1	S-1 S-2
Other social / personal competences							
CE_2A_ICM/D/02_K01 Student is able in both professional and responsible way use gained knowledge and skills in executions works associated with international tendering	B-A_2A_K02	P7S_KK		C-1	T-A-1 T-W- T-W-1 T-W- T-W-2 T-W- T-W-3 T-W- T-W-4 T-W-4	6 7 M-1	S-1 S-2
Required reading							
1. T. Brandt, S. TH. Franssen, Basics tendering, Birkhause	er, 2017						

Field of								
	study	Civ	il E	ngineering				
Mode of	f study	sta	tior	nary	Level	second cycle		
Graduat	te's qualifi	<i>cation</i> ma	gist	ter			WBi/	7
Area(s)	of study	nau	ıki t	techniczne				`
Educatio	onal profile	e ger	nera	al academic				
Module							-	
Course i	unit	Cui	rre	nt Developme	ents in Civil Eng	ineering and Built	-	
	um			onment	_		-	
Code			-	S2CE/ICM/D/04			- \	
Field of	specialisa	tion Inte	erna	ational Constru	ction Manageme	nt		
Adminis	stering fac	ulty Kat	edr	a Geotechniki				
ECTS		3,0			ECTS (forms)	3,0		
Form of	^c ourse cr	edit exa	mi	nation	Language	english		
Elective	es				Elective group			
Form of	f instructio	n Cod	le	Semester	Hours	ECTS	Weight	Credit
discussi	ion sessior	ns K		1	15	1,5	0,50	credits
lecture		W	,	1	30	1,5	0,50 0,50 0,50 a Karolina cchel Grzegorz @zut.edu.pl), W mts in construction ies used in civil nd materials. ete elements, s in civil es, new systems	examination
Leading	ı teacher	Poz	, Iew	vicz Andrzei (Ar	ndrzej.Pozlewicz@			
Other te	eachers	(Ka (Gr:	roli zeg	na.Kurtz@zut.e Jorz.Szmechel@	edu.pl), Nauczycie	el WBiA - (a@b), Szme ing Professor (Visiting	echel Grzegorz	Wygocka-
Prerequ	isites							
W-1	English	language at leve	el B	2				
W-2	1st cycl	e diploma in civi	il er	naineerina				
		•		5 - 5				
Module/	/course un	it objectives						
Module/ C-1	The aim	<i>it objectives</i> is to provide th	e st	tudent with conte	emporary topics release available on th	evant to new developme e market	ents in construction	on industry with
C-1	The aim referent	<i>it objectives</i> is to provide th ce to technologic vided into vari	e st es, i	udent with conte materials, softaw	are available on th uction	e market		on industry with Number of hours
C-1	The aim reference content di Discuss	<i>it objectives</i> n is to provide th ce to technologie <i>vided into vari</i> ion on advantag	e st es, i ous	udent with conte materials, softaw forms of instru and disadvantage	are available on th <i>uction</i> es of new materials	e market	ies used in civil	-
C-1 Course o	The aim reference content di Discuss enginee New teo new sys enginee of flood	<i>it objectives</i> is to provide th ce to technologie <i>vided into vari</i> ion on advantag ering industry. W chnologies in cor stems of excaval ering, new sealin protection and	e st es, i es a ritte ncre tion ig sy wat	tudent with contermaterials, softaw forms of instru- and disadvantage en report with ch ete structures, ne s support, anchor ystems, sustainal er management,	are available on th action es of new materials aracteristics of give w generation concer ring and bracing sy ble building and pa	e market , systems and technolog en technology, system a rete, 3d printing of conci stems, modern material ssive houses technologi tware systems in CAD a	ies used in civil nd materials. rete elements, s in civil es, new systems	Number of hours
C-1 Course o T-K-1 T-W-1	The aim reference content di Discuss enginee New teo new sys enginee of flood manage	<i>it objectives</i> is to provide th ce to technologie <i>vided into vari</i> ion on advantag ering industry. W chnologies in cor stems of excaval ering, new sealin protection and	le st es, i les a ritto ncre tion ig sy wat ds i	tudent with contermaterials, softaw s forms of instru- and disadvantage en report with ch ete structures, ne s support, ancho ystems, sustainal er management, n civil engineerin	are available on th action es of new materials aracteristics of give w generation concer ring and bracing sy ble building and pa new developed sof	e market , systems and technolog en technology, system a rete, 3d printing of conci stems, modern material ssive houses technologi tware systems in CAD a	ies used in civil nd materials. rete elements, s in civil es, new systems	Number of hours
C-1 Course o T-K-1 T-W-1	The aim reference content di Discuss enginee New teo new sys enginee of flood manage	<i>it objectives</i> n is to provide th ce to technologie <i>vided into vari</i> ion on advantag ering industry. W chnologies in cor stems of excavate ering, new sealin protection and we ement, new tren	le st es, i les a ritto ncre tion ig sy wat ds i	tudent with contermaterials, softaw s forms of instru- and disadvantage en report with ch ete structures, ne s support, ancho ystems, sustainal er management, n civil engineerin	are available on th action es of new materials aracteristics of give w generation concer ring and bracing sy ble building and pa new developed sof	e market , systems and technolog en technology, system a rete, 3d printing of conci stems, modern material ssive houses technologi tware systems in CAD a	ies used in civil nd materials. rete elements, s in civil es, new systems	Number of hours 15 30
C-1 Course o T-K-1 T-W-1 Student	The aim reference content di Discuss enginee New teo new sys enginee of flood manage tworkload	<i>it objectives</i> is to provide th ce to technologie <i>vided into vari</i> ion on advantag ering industry. W chnologies in cor stems of excavate ering, new sealin protection and ement, new trend - forms of actions	ie st es, i ous ritton cretion ig sy wat ds i	tudent with contermaterials, softaw s forms of instru- and disadvantage en report with ch ete structures, ne s support, ancho ystems, sustainal er management, n civil engineerin	are available on th <i>iction</i> aracteristics of give w generation concer- ring and bracing sy ble building and pa new developed sof g materials and tee	e market , systems and technolog en technology, system a rete, 3d printing of conci stems, modern material ssive houses technologi tware systems in CAD a	ies used in civil nd materials. rete elements, s in civil es, new systems	Number of hours 15 30 Number of hours
C-1 Course of T-K-1 T-W-1 Student A-K-1 A-K-2 A-K-3	The aim referent content di Discuss enginee New teo new sys enginee of flood manage tworkload Presence Searchi Consult	<i>it objectives</i> is to provide th ce to technologie <i>vided into vari</i> ion on advantag ering industry. W chnologies in cor stems of excavate ering, new sealin protection and ement, new tren - forms of acti is in classes ing in data bases ancies	rous fous res a rritto nore tion ng sy wat ds i <i>vity</i>	tudent with contermaterials, softaw forms of instru- and disadvantage en report with ch et estructures, ne s support, anchor ystems, sustainal er management, n civil engineerin / d in internet, des	are available on th <i>iction</i> aracteristics of give w generation concer- ring and bracing sy ble building and pa new developed sof g materials and tee	e market , systems and technolog en technology, system a rete, 3d printing of conci stems, modern material ssive houses technologi tware systems in CAD a	ies used in civil nd materials. rete elements, s in civil es, new systems	Number of hours 15 30 Number of hours 15
C-1 Course of T-K-1 T-W-1 Student A-K-1 A-K-2 A-K-3 A-K-4	The aim reference content di Discuss enginee New teo new sys enginee of flood manage tworkload Presence Searchi Consult Prepara	it objectives is to provide th ce to technologie vided into vari ion on advantag ering industry. W chnologies in cor stems of excavate ering, new sealin protection and ement, new trend - forms of action ce in classes ancies tion of report an	ous ous res a rritte ds i fvity s an	tudent with contermaterials, softaw forms of instru- and disadvantage en report with ch et e structures, ne s support, anchoi ystems, sustainal er management, n civil engineerin / d in internet, des	are available on th <i>iction</i> aracteristics of give w generation concer- ring and bracing sy ble building and pa new developed sof g materials and tee k study	e market , systems and technolog en technology, system a rete, 3d printing of conc stems, modern material ssive houses technologi tware systems in CAD a chnologies	ies used in civil nd materials. rete elements, s in civil es, new systems	Number of hours 15 30 Number of hours 15 14 4 6
C-1 Course of T-K-1 T-W-1 Student A-K-1 A-K-2 A-K-3 A-K-3 A-K-5	The aim reference content di Discuss enginee New teo new sys enginee of flood manage tworkload Presence Searchi Consult Prepara overvie	it objectives is to provide th ce to technologie vided into vari ion on advantag ering industry. W chnologies in cor stems of excavat protection and ement, new sealin protection and - forms of acti te in classes ang in data bases ancies tion of report an w of companies	ous ous res a rritte ds i fvity s an	tudent with contermaterials, softaw forms of instru- and disadvantage en report with ch et e structures, ne s support, anchoi ystems, sustainal er management, n civil engineerin / d in internet, des	are available on th <i>iction</i> aracteristics of give w generation concer- ring and bracing sy ble building and pa new developed sof g materials and tee	e market , systems and technolog en technology, system a rete, 3d printing of conc stems, modern material ssive houses technologi tware systems in CAD a chnologies	ies used in civil nd materials. rete elements, s in civil es, new systems	Number of hours 15 30 Number of hours 15 14 6 5
C-1 Course of T-K-1 T-W-1 Student A-K-1 A-K-2 A-K-3 A-K-3 A-K-4 A-K-5 A-W-1	The aim reference content di Discuss enginee of flood manage tworkload Presence Searchi Consult Prepara overvie	it objectives is to provide th ce to technologie vided into vari ion on advantag ering industry. W chnologies in cor stems of excavate ering, new sealin protection and protection and ement, new trend - forms of acti is in classes ancies tion of report ar w of companies is on lectures	e st es, i ous les a /ritto ncreation ig sy wat ds i i vit y an poffe	tudent with contermaterials, softaw forms of instru- and disadvantage en report with ch et e structures, ne s support, anchory ystems, sustainal er management, n civil engineerin d in internet, des ass the subject er from the sector	are available on th <i>uction</i> es of new materials aracteristics of give w generation concer- ring and bracing sy ble building and pa new developed sof g materials and tec- k study r of civil engineerin	e market , systems and technolog en technology, system a rete, 3d printing of conc stems, modern material ssive houses technologi tware systems in CAD a chnologies	ies used in civil nd materials. rete elements, s in civil es, new systems	Number of hours 15 30 Number of hours 15 14 4 5 30
C-1 Course of T-K-1 T-W-1 Student A-K-1 A-K-2 A-K-3 A-K-3 A-K-4 A-K-5 A-W-1 A-W-2	The aim reference content di Discuss enginee New teo new sys enginee of flood manage tworkload Presence Searchi Consult Prepara overvie Presence	<i>it objectives</i> is to provide th ce to technologie <i>vided into vari</i> ion on advantag ering industry. W chnologies in cor stems of excavate ering, new sealin protection and w ement, new trend - forms of acti ce in classes ancies tion of report an w of companies ie on lectures udy on new tech	ie st es, i ous ritto ncre tion ng sy wat ds i s an offe	tudent with contermaterials, softaw and disadvantage en report with ch ete structures, ne s support, ancho ystems, sustainal er management, n civil engineerin / d in internet, des ass the subject er from the sector	are available on th <i>uction</i> es of new materials aracteristics of give w generation concer- ring and bracing sy ble building and pa new developed sof g materials and tec- k study r of civil engineerin	e market , systems and technolog en technology, system a rete, 3d printing of conc stems, modern material ssive houses technologi tware systems in CAD a chnologies	ies used in civil nd materials. rete elements, s in civil es, new systems	Number of hours 15 30 Number of hours 15 14 6 5 30 10
C-1 Course of T-K-1 Student A-K-1 A-K-2 A-K-3 A-K-3 A-K-5 A-K-5 A-W-1 A-W-2 A-W-2	The aim reference content di Discuss enginee New teo new sys enginee of flood manage tworkload Presence Searchi Consult Prepara overvie Presence Desk st	it objectives is to provide th ce to technologie vided into vari ion on advantag ering industry. W chnologies in cor stems of excavat ering, new sealin protection and ement, new trend - forms of action ancies ancies tion of report an w of companies te on lectures udy on new tech ancies and discu	ie st es, i ous ritto ncre tion ng sy wat ds i s an offe	tudent with contermaterials, softaw and disadvantage en report with ch ete structures, ne s support, ancho ystems, sustainal er management, n civil engineerin / d in internet, des ass the subject er from the sector	are available on th <i>uction</i> es of new materials aracteristics of give w generation concer- ring and bracing sy ble building and pa new developed sof g materials and tec- k study r of civil engineerin	e market , systems and technolog en technology, system a rete, 3d printing of conc stems, modern material ssive houses technologi tware systems in CAD a chnologies	ies used in civil nd materials. rete elements, s in civil es, new systems	Number of hours 15 30 Number of hours 15 14 6 5 30 10 3
C-1 Course of T-K-1 T-W-1 Student A-K-1 A-K-2 A-K-3 A-K-3 A-K-4 A-K-5 A-W-1 A-W-2 A-W-3 A-W-4	The aim reference content di Discuss enginee New teo new sys enginee of flood manage tworkload Presence Searchi Consult Prepara overvie Presence Desk st Consult Examin	<i>it objectives</i> is to provide th ce to technologie <i>vided into vari</i> ion on advantag ering industry. W chnologies in cor stems of excavate ering, new sealin protection and v ement, new trend - forms of acti ce in classes ancies tion of report an w of companies te on lectures udy on new tech ancies and discu- ation	ie st es, i ous ritto ncre tion ng sy wat ds i s an offe	tudent with contermaterials, softaw and disadvantage en report with ch ete structures, ne s support, ancho ystems, sustainal er management, n civil engineerin / d in internet, des ass the subject er from the sector	are available on th <i>uction</i> es of new materials aracteristics of give w generation concer- ring and bracing sy ble building and pa new developed sof g materials and tec- k study r of civil engineerin	e market , systems and technolog en technology, system a rete, 3d printing of conc stems, modern material ssive houses technologi tware systems in CAD a chnologies	ies used in civil nd materials. rete elements, s in civil es, new systems	Number of hours 15 30 Number of hours 15 14 6 5 30 10
C-1 Course of T-K-1 T-W-1 Student A-K-1 A-K-2 A-K-3 A-K-4 A-K-5 A-K-5 A-W-1 A-W-2 A-W-3 A-W-3 A-W-4 Teachin	The aim reference content di Discuss enginee New teo new sys enginee of flood manage tworkload Presence Searchi Consult Prepara overvie Presence Desk st Consult Examin	<i>it objectives</i> is to provide th ce to technologie <i>vided into vari</i> ion on advantag ering industry. W chnologies in cor stems of excavate ering, new sealin protection and v ement, new trend - forms of acti ce in classes ancies tion of report an w of companies te on lectures udy on new tech ancies and discu- ation	ie st es, i ous ritto ncre tion ng sy wat ds i s an offe	tudent with contermaterials, softaw and disadvantage en report with ch ete structures, ne s support, ancho ystems, sustainal er management, n civil engineerin / d in internet, des ass the subject er from the sector	are available on th <i>uction</i> es of new materials aracteristics of give w generation concer- ring and bracing sy ble building and pa new developed sof g materials and tec- k study r of civil engineerin	e market , systems and technolog en technology, system a rete, 3d printing of conc stems, modern material ssive houses technologi tware systems in CAD a chnologies	ies used in civil nd materials. rete elements, s in civil es, new systems	Number of hours 15 30 Number of hours 15 14 6 5 30 10 3
C-1 Course of T-K-1 T-W-1 Student A-K-1 A-K-2 A-K-3 A-K-4 A-K-5 A-W-1 A-W-2 A-W-1 A-W-2 A-W-3 A-W-4 Teachin M-1	The aim reference content di Discuss enginee New teo new sys enginee of flood manage tworkload Presence Searchi Oresult Prepara overvie Presence Desk st Consult Examin og methods	<i>it objectives</i> is to provide th ce to technologie <i>vided into vari</i> ion on advantag ering industry. W chnologies in cor stems of excavate ering, new sealin protection and w ement, new trend - forms of acti ce in classes ng in data bases ancies tion of report an w of companies ce on lectures udy on new tech ancies and discu- ation	ie st es, i ous les a rritti- nore tion g sy wat ds i s an offe	tudent with contermaterials, softaw and disadvantage en report with ch et e structures, ne s support, anchoi ystems, sustainal er management, n civil engineerin / d in internet, des ass the subject er from the sector ogies in civil engi	are available on th <i>uction</i> es of new materials aracteristics of give w generation concer- ring and bracing sy ble building and pa new developed sof g materials and tec- k study r of civil engineerin	e market , systems and technolog en technology, system a rete, 3d printing of conc stems, modern material ssive houses technologi tware systems in CAD a chnologies	ies used in civil nd materials. rete elements, s in civil es, new systems	Number of hours 15 30 Number of hours 15 14 6 5 30 10 3
C-1 Course of T-K-1 T-W-1 Student A-K-1 A-K-2 A-K-3 A-K-3 A-K-4 A-K-5 A-W-1 A-W-2 A-W-3 A-W-3 A-W-4 Teachin M-1 M-2	The aim reference content di Discuss enginee New teo new sys enginee of flood manage tworkload Presence Searchi Consult Prepara overvie Desk st Consult Examin g methods lecture interact	<i>it objectives</i> is to provide th ce to technologie <i>vided into vari</i> ion on advantag ering industry. W chnologies in cor stems of excavat ering, new sealin protection and <i>protection and protection and protection and protection and protection and protection and protection and protection ement, new trem <i>- forms of acti</i> are in classes ancies tion of report an w of companies te on lectures udy on new tech ancies and discu ation <i>s / tools</i></i>	ie st es, i ous les a rritte dis i i vit s an offe anol ussie	tudent with contermaterials, softaw and disadvantage en report with ch ete structures, ne s support, ancho ystems, sustainal er management, n civil engineerin / d in internet, des ass the subject er from the sector ogies in civil engine ons	are available on th <i>uction</i> es of new materials aracteristics of give w generation concer- ring and bracing sy ble building and pa new developed sof g materials and tec- k study r of civil engineerin	e market , systems and technolog en technology, system a rete, 3d printing of conc stems, modern material ssive houses technologi tware systems in CAD a chnologies	ies used in civil nd materials. rete elements, s in civil es, new systems	Number of hours 15 30 Number of hours 15 14 4 6 5 30 10 3
C-1 Course of T-K-1 T-W-1 Student A-K-1 A-K-2 A-K-3 A-K-3 A-K-4 A-K-5 A-W-1 A-W-2 A-W-2 A-W-3 A-W-4 Teachin M-1 M-2 Evaluati	The aim reference content di Discuss enginee of flood manage tworkload Presence Searchi Overvie Prepara overvie Prepara overvie Examin g methods interact	<i>it objectives</i> is to provide th ce to technologie <i>vided into vari</i> ion on advantag ering industry. W chnologies in cor stems of excavate ering, new sealin protection and w ement, new trend - forms of acti ce in classes ng in data bases ancies tion of report an w of companies te on lectures udy on new tech ancies and discu- ation <i>s / tools</i>	ie st es, i ous ies a fritti- nore tion g sy wat disc isive disc	tudent with contermaterials, softaw and disadvantage en report with ch ete structures, ne s support, anchoi ystems, sustainal er management, n civil engineerin / d in internet, des ass the subject er from the sector ogies in civil engi ons 	are available on th uction as of new materials aracteristics of give w generation concer- ring and bracing sy ble building and pa new developed sof g materials and tec- k study r of civil engineerin ineering	e market , systems and technolog en technology, system a rete, 3d printing of conc stems, modern material ssive houses technologi tware systems in CAD a chnologies	ies used in civil nd materials. rete elements, s in civil es, new systems	Number of hours 15 30 Number of hours 15 14 4 6 5 30 10 3
C-1 Course of T-K-1 T-W-1 Student A-K-1 A-K-2 A-K-3 A-K-3 A-K-4 A-K-5 A-W-1 A-W-2 A-W-3 A-W-3 A-W-3 A-W-4 Teachin M-1 M-2	The aim reference content di Discuss enginee New teo new sys enginee of flood manage tworkload Presence Searchi Consult Prepara overvie Presence Desk st Consult Examin g methods lecture interact	<i>it objectives</i> is to provide th ce to technologie <i>vided into vari</i> ion on advantag ering industry. W chnologies in cor stems of excavate ering, new sealin protection and v ement, new trend - forms of acti te in classes and in data bases ancies tion of report an w of companies te on lectures udy on new tech ancies and discu- ation <i>s / tools</i>	ie st es, i les a /ritti- ncre- tion g sy wat disc s an offe nnol ussio disc sive ssr	tudent with contermaterials, softaw s forms of instru- and disadvantage en report with ch ete structures, ne s support, ancho ystems, sustainal er management, n civil engineerin / d in internet, des ass the subject er from the sector ogies in civil enginons ons e, P - final) hent of student's	are available on th uction as of new materials aracteristics of give w generation concer- ring and bracing sy ble building and pa new developed sof g materials and tec- k study r of civil engineerin ineering	e market , systems and technolog en technology, system a rete, 3d printing of conc stems, modern material ssive houses technologi tware systems in CAD a chnologies	ies used in civil nd materials. rete elements, s in civil es, new systems	Number of hours 15 30 Number of hours 15 14 4 6 5 30 10 3

Designed learning outcomes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course	content	Teaching methods	Evaluation methods
Knowledge								
B-A_2A_ICM/D/03_W01 Student is familiar with new developed technologies, materials, computer systems used in civil engineering. Knows new trends and achievements in building industry.	B-A_2A_W09 B-A_2A_W13	P7S_WG_TA21	P75_WG_IA21	C-1	T-K-1	T-W-1	M-1 M-2	S-1 S-2
Skills	•	•	•				•	
B-A_2A_ICM/D/03_U01 Student is able to estimate possibilty to use in construction new developed materials, technologies and computer software.	B-A_2A_U19	P7S_UW_TA24		C-1	Т-К-1	T-W-1	M-1 M-2	S-1 S-2
Other social / personal competences								
B-A_2A_ICM/D/03_K01 Student understands the necessity of assessment new technologies, materials and software used in modern construction methods with respect to sustainable development.	B-A_2A_K04 B-A_2A_K06	P7S_KK P7S_KR		C-1	T-K-1	T-W-1	M-1 M-2	S-1 S-2
Required reading								
1. Scientific and professional journals in the area of civil	engineering							
2. Civil Engineering and Construction Materials, Knovel S	ystem							

	Preparation of th Participation in I		reparation of the	project						9
A-P-1	Participation in I	ectures								15
Student	Shotcreate. Arch workload - forms								Number o	of hours
T-P-1 T-W-1	generation of co consolidating co	of concret ncrete. Eff ncrete, miz	e principles. Com ect of additions a x composition, te	parison the compos nd admixtures on c st methods. Charac	oncrete pro	perties. Appli	cations	. Self-		15 30
	content divided in			uction					Number o	of hours
С-3	Getting to know	compositio	on of the concrete	e methods of design	of a new ge	eneration			1	
C-2	-			the properties of m			ncrete			
C-1	-			nd concrete techno						
Module/d	course unit object	ives								
W-1	Basic knowledge	on the bu	ilding materials a	nd concrete techno	logy					
Prerequi	isites									
Other te	achers	(Maria	.Kaszynska@zu	r.Brzozowski@zu it.edu.pl), Olczyk ut.edu.pl), Zielins	Norbert (N	orbert.Olczy	yk@zut			
Leading	teacher		•	erz (Wlodzimierz.	-					
lecture		W	1	30		1,2	0	,50	cred	its
project c	course	Р	1	15		0,8		,50	cred	
Form of	instruction	Code	Semester	Hours	E	CTS		eight	Cree	dit
Electives	-			Elective group					I	
Form of	course credit	credit	S	Language	english		_			
ECTS		2,0		ECTS (forms)	2,0					
Administ	tering faculty	Kated	ra Konstrukcji Ż	elbetowych i Tec	hnologii Be	tonu				
Field of s	specialisation	Intern	ational Constru	ction Managemer	nt					
Code			S2CE/ICM/D/05				1	- 11		
Course u	unit		nced Concrete ective	e Structures - In	ternation	al				
Module								- 11	n IC	
Educatio	onal profile	gener	al academic					- 11		
Area(s) d	of study	nauki	techniczne						`	_
	e's qualification	magis	ter	1			V	VBi/	7	
Graduat	study	statio	nary	Level	second	cycle				

Skills							
CE_2A_ICM/D/04_U01 Can select the components of the new generation mix, test the properties and compare the results with Standards. Can design a mix for special use	B-A_2A_U09 B-A_2A_U11 B-A_2A_U13	P7S_UK P7S_UO P7S_UW_TA21 P7S_UW_TA22 P7S_UW_TA23	 C-1 C-2 C-3	T-P-1	T-W-1	M-1 M-2	S-1 S-2
Other social / personal competences							
CE_2A_ICM/D/04_K01 Understands the need for constant improvement of the knowledge of modern concretes. Understands the responsibilities for test results and their influence on further decisions.	B-A_2A_K01 B-A_2A_K03	P7S_KK	C-1 C-2 C-3	T-P-1	T-W-1	M-1 M-2	S-1 S-2
Required reading							
1. Neville A., Properties of Concrete, London, 2012							
2. Aitcin P.C., High-Performance Concrete., E&FN SPON,	1998						

Field of s	study	Civil I	Engineering				
Mode of	study	statio	onary	Level	second cycle		
Graduate	e's qualification	magi	ster			WBi/	Д
Area(s) c	of study	nauki	techniczne				
Educatio	nal profile	gene	ral academic				
Module							
Course u	ınit	Cons	truction Tech	nologies			
Code		WBIA	/S2CE/ICM/D/06	1		- 1 1	
Field of s	specialisation	Interr	national Constru	ction Managemen	t		
Administ	tering faculty	Kated	lra Geotechniki				
ECTS		3,0		ECTS (forms)	3,0		
Form of a	course credit	credit	ts	Language	english		
Electives	5			Elective group			
Form of	instruction	Code	Semester	Hours	ECTS	Weight	Credit
project c		P	1	15	1,5	0,50	credits
lecture		F W	1	30	1,5	0,50	credits
						0,50	
Leading			•	ndrzej.Pozlewicz@ ata (Malgorzata Ak	zut.edu.pl) pramowicz@zut.edu.	nl) Nauczyciał	WRIA - (agh)
Other tea	achers				el@zut.edu.pl), Visitii		
Prerequis	sites				<u> </u>	-	
W-1	Basics of civil engir	neering					
Module/c	course unit objective	e <i>s</i>					
C-1			th various techno	logies for the execut	ion of construction wor	ks	
C-2	Familiarize the stud	dent wi	th the issues of d	evelopment of the co	onstruction site		
Course c	content divided into	variou	is forms of instr	uction			Number of hours
T-P-1	Project of developm	nent of	the construction	site for earthworks i	n complex geotechnica	l conditions	15
T-W-1	Introduction to the	various	s construction sys	tems			2
T-W-2	Stages for construc	tion: B	uilding				2
T-W-3	Stages for construc		3				2
T-W-4	Stages for construct		-				2
T-W-5	Stages for construct						2
T-W-6 T-W-7	Stages for construc Stages for mainten						2
T-W-8	Stages for mainten		-				2
1-00-0	-			of plant selections Ty	pes, functions, capabil	ities and	<u>_</u>
T-W-9	selection of moving		ines. Idustrial safe	ety on building site, i	ndividual and staff safe	ety in	4
T-W-10	Temporary works :						2
T-W-10	Function, types and			rk struction of Scaffoldi	ng Shoring		2
1-00-11	Permanent work		on, types and con		ng, shunng		2
T-W-12	Reinforced Concret	e Tech	nology				2
1-00-12	- Precast Concrete - Piling						2
	- Brick laying Latest Technology						
T-W-13	Trenchless Technol						2
	Ground Improveme Latest Technology	ent					
T-W-14	BIM						2
	GREEN BUILDING	TION					
Student	workload - forms of	activi	ty				Number of hours
A-P-1	participation in clas		-				15
A-P-2	Own design project	work					30
	<u> </u>						- I

Student	workloa	əd	- forms of activity						Num	ber of	hours
A-W-1	Prese	enc	e at the class								30
A-W-2	Own	wc	ork wit literature								5
A-W-3	Final	te	st preparation								5
A-W-4	Desig	ŋn	Project preparation and consult								5
Teaching	, metho	od s	s / tools								
M-1	Inforr	ma	tion Lecture								
М-2	Case	st	udy Lecture								
М-3	Proje	ct	method								
Evaluatio	on meth	10	ds (F - progressive, P - final)								
S-1	Р		Student must prepare design project	of site develop	ment plan for	chosen engine	ering s	cope o	f works		
S-2	Р		Student must pass the test from lect	ures, and take li	ve participatio	on in class dis	cussion				
	Desig	gn	ed learning outcomes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Cours	e content	Teaching methods	Evaluation methods
Knowledg	ge					I					
rules for the	he require e perform	em nan	ents, general recommendations and ce of small-volume objects and the and material shaping of high-rise	B-A_2A_W08 B-A_2A_W10 B-A_2A_W11 B-A_2A_W13	P75_WG_TA21	P75_WG_IA21	C-1 C-2	T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 T-W-6 T-W-7	T-W-8 T-W-9 T-W-10 T-W-11 T-W-12 T-W-13 T-W-14	M-1 M-2	S-2
Skills											
collecting in	he basics formatio ysis and	of n f	designing and dimensioning and rom all available sources, make their ection of the best methods of task	B-A_2A_U01 B-A_2A_U21 B-A_2A_U24 B-A_2A_U26	P7S_UK P7S_UU P7S_UW_TA22 P7S_UW_TA24		C-1 C-2	T-P-1		M-1 M-2 M-3	S-1 S-2
Other so	cial / pe	ers	sonal competences								
environmen and the nec expanding l	s the imp it and ma cessity of knowledg	an i co le i	t of construction activities on the natural in the aspect of sustainable development ntinuing independent learning and n the field of modern technologies and on solutions in construction	B-A_2A_K04 B-A_2A_K06	P75_KK P7S_KR		C-1 C-2	T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-5 T-W-6 T-W-7	T-W-8 T-W-9 T-W-10 T-W-11 T-W-12 T-W-13 T-W-14	M-1 M-2 M-3	S-1 S-2
Required	l readin	ng									
1. Eric Fle	ming, C	on	struction Technology: An Illustrated I	ntroduction, 200	05						
Supplem	entary	re	ading								
1 Roy Ch	udler, C	on	struction technology, 1973								

Field of :	study	Civil E	Engineering							
Mode of	f study	statio	nary	Level	second o	cycle				
Graduat	te's qualificatio	n magis	ster				W	BiA		
Area(s)	of study	nauki	techniczne							_
Educatio	onal profile	gener	ral academic							
Module								- 11 a		п.
Course u	unit	Appli	ied Construct	ion Managemen	t					!
Code		WBIA,	/S2CE/ICM/D/07	7						
Field of	specialisation	Interr	national Constru	uction Manageme	nt					
Adminis	stering faculty		ół Dydaktyczny wnictwie	Ekonomiki, Orgar	nizacji i Zarz	ządzania w		JĽ		
ECTS		2,0		ECTS (forms)	2,0					
Form of	course credit	credit	S	Language	english					
Electives	2S			Elective group						
Form of	f instruction	Code	Semester	Hours	E	CTS	Weig	ht	Credi	t
project o	course	Р	1	15		1,0	0,50)	credit	S
lecture		W	1	15		1,0	0,50)	credit	s
Leading	teacher	Boche	enek Magdalen	a (Magdalena.Boc	henek@zut	.edu.pl)		I		
Other te			j			····				
Prerequi	uisites									
W-1		dge of constr	uction technolog	y and construction r	naterials.					
		5	5							
		tion of this co		t will be able to use						
C-1	Upon comple	tion of this co Instruction sta	age of the projec	t whilst developing i				of constru		blems
C-1	Upon comple during the co content dividec	tion of this construction stand	age of the projec	t whilst developing i				of constru	ction pro	blems
C-1 Course d	Upon comple during the co content divideo Case Studies	tion of this construction stand <i>into variou</i> of some cons	age of the projec	t whilst developing i				of constru	ction pro	blems hours
C-1 Course o T-P-1 T-W-1 T-W-2	Upon comple during the co content divideo Case Studies	tion of this construction stand <i>into variou</i> of some cons procedures a	age of the projec	t whilst developing i				of constru	ction pro	blems hours 15 1 5
C-1 Course o T-P-1 T-W-1 T-W-2 T-W-3	Upon comple during the co content divideo Case Studies Construction Planning and Lean constru	tion of this construction stand d into variou of some cons procedures a control ction	age of the projec	t whilst developing i				of constru	ction pro	blems hours 15 1 5 2
C-1 Course of T-P-1 T-W-1 T-W-2 T-W-3 T-W-4	Upon comple during the co content divided Case Studies Construction Planning and Lean constru Information n	tion of this construction stand d into variou of some cons procedures a control ction management	age of the project s forms of instruction manage and strategies	t whilst developing i				of constru	ction pro	blems hours 15 1 5 2 2 2
C-1 Course of T-P-1 T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5	Upon comple during the co content dividec Case Studies Construction Planning and Lean constru Information n Environment	tion of this construction stand d into variou of some cons procedures a control ction nanagement al manageme	age of the project s forms of instruction manage and strategies	t whilst developing i				of constru	ction pro	blems hours 15 1 5 2 2 2 2 2
C-1 Course of T-P-1 T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-6	Upon comple during the co Case Studies Construction Planning and Lean constru Information n Environmenta Risk manage	tion of this construction stand d into variou of some cons procedures a control ction nanagement al manageme ment in const	age of the project s forms of instruction manage and strategies ent truction	t whilst developing i				of constru Nu	ction pro	blems hours 15 1 2 2 2 2 3
C-1 Course of T-P-1 T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-6 Student	Upon comple during the co Content divided Case Studies Construction Planning and Lean constru Information n Environmenta Risk manage	tion of this construction stand d into variou of some cons procedures a control ction nanagement al management ment in const ms of activit	age of the project s forms of instruction manage and strategies ent truction	t whilst developing i				of constru Nu	ction pro	blems hours 15 1 2 2 2 2 3 hours
C-1 Course of T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-5 T-W-6 Student A-P-1	Upon comple during the co Case Studies Construction Planning and Lean constru Information n Environmenta Risk manage tworkload - forn Class Particip	tion of this construction stand onstruction stand of some cons procedures a control ction management al management al management ment in const ment in const ms of activition	age of the project s forms of instruction manage and strategies ent truction	t whilst developing i				of constru Nu	ction pro	blems hours 15 1 2 2 2 2 3
C-1 Course of T-P-1 T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-6 Student	Upon comple during the co Content divided Case Studies Construction Planning and Lean constru Information n Environmenta Risk manage	tion of this construction stand of into variou of some cons procedures a control ction nanagement al management al management ment in const ms of activit pation paration	age of the project s forms of instruction manage and strategies ent truction	t whilst developing i				of constru Nu	ction pro	blems hours 15 1 2 2 2 2 3 hours 15
C-1 Course of T-P-1 T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-6 Student A-P-1 A-P-2	Upon comple during the co content divided Case Studies Construction Planning and Lean constru Information n Environmenta Risk manage workload - forn Class Particip Exercise prep Class Particip	tion of this construction stand onstruction stand of some cons procedures a control ction management al management al management ment in const ment in const ment of activit pation paration	age of the project s forms of insta struction manage and strategies ent truction	t whilst developing i	management			of constru Nu	ction pro	blems hours 15 1 2 2 2 2 3 hours 15 15
C-1 Course of T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-5 Student A-P-1 A-P-2 A-W-1	Upon comple during the co content divided Case Studies Construction Planning and Lean constru Information n Environmenta Risk manage workload - forn Class Particip Exercise prep Class Particip	tion of this construction stand onstruction stand of some cons procedures a control ction management al management al management ment in const ment in const mation paration pation analysis of le	age of the project s forms of insta struction manage and strategies ent truction	t whilst developing i	management			of constru Nu	ction pro	blems hours 15 1 2 2 2 2 2 2 2 3 <i>hours</i> 15 15 15
C-1 Course of T-P-1 T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-5 T-W-6 Student A-P-1 A-P-2 A-W-1 A-W-2	Upon comple during the co Case Studies Construction Planning and Lean constru Information n Environmenta Risk manage tworkload - forn Class Particip Exercise prep Class Particip Independent	tion of this construction stand onstruction stand of some cons procedures a control ction management al management al management ment in const ment in const mation paration pation analysis of le	age of the project s forms of insta struction manage and strategies ent truction	t whilst developing i	management			of constru Nu	ction pro	blems hours 15 1 2 2 2 2 3 hours 15 15 15 7
C-1 Course of T-P-1 T-W-1 T-W-2 T-W-3 T-W-3 T-W-5 T-W-6 Student A-P-1 A-P-2 A-W-1 A-W-2 A-W-3 A-W-4	Upon comple during the co Case Studies Construction Planning and Lean constru Information n Environmenta Risk manage Workload - forn Class Particip Exercise prep Class Particip Independent Preparation f	tion of this construction stand onstruction stand of some construction procedures a control ction nanagement al management al management ment in const ment in const ment in const mation paration pation analysis of le or the exam	age of the project s forms of insta struction manage and strategies ent truction	t whilst developing i	management			of constru Nu	ction pro	blems hours 15 1 2 2 2 2 2 2 2 3 hours 15 15 15 7 7 7
C-1 Course of T-P-1 T-W-1 T-W-2 T-W-3 T-W-3 T-W-5 T-W-6 Student A-P-1 A-P-2 A-W-1 A-W-2 A-W-3 A-W-4	Upon comple during the co Case Studies Construction Planning and Lean constru Information n Environmenta Risk manage Workload - forn Class Particip Exercise prep Class Particip Independent Preparation for Final exam	tion of this construction stands and the second stands are stands at the second stand stands at the second stands at the second stands at t	age of the project s forms of insta struction manage and strategies ent truction	t whilst developing i	management			of constru Nu	ction pro	blems hours 15 1 2 2 2 2 2 2 2 3 hours 15 15 15 7 7 7
C-1 Course of T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 Student A-P-1 A-P-2 A-W-1 A-W-2 A-W-1 A-W-2 A-W-3 A-W-4 Teaching M-1	Upon comple during the co Case Studies Construction Planning and Lean constru Information n Environmenta Risk manage Workload - forn Class Particip Exercise prep Class Particip Independent Preparation fi Final exam	tion of this construction stand onstruction stand of some conservation procedures a control ction management al management al management ment in const ment in const ment in const ment in const mation paration pation analysis of le or the exam ols e studies	age of the project s forms of insti- struction manage and strategies ent truction ty	t whilst developing i	management			of constru Nu	ction pro	blems hours 15 1 2 2 2 2 2 2 2 3 hours 15 15 15 7 7 7
C-1 Course of T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 Student A-P-1 A-P-2 A-W-1 A-W-2 A-W-1 A-W-2 A-W-3 A-W-4 Teaching M-1	Upon comple during the co Case Studies Construction Planning and Lean constru Information n Environmenta Risk manage Workload - forn Class Particip Exercise prep Class Particip Independent Preparation fi Final exam	tion of this construction stand onstruction stand of some conservation procedures a control ction management al management al management ment in const ment in const ment in const ment in const mation paration pation analysis of le or the exam ols e studies	age of the project s forms of insta struction manage and strategies ent truction ty ecture content an content an <i>(e, P - final)</i>	t whilst developing i	management			of constru Nu	ction pro	blems hours 15 1 2 2 2 2 2 2 2 3 hours 15 15 15 7 7 7
C-1 Course of T-P-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-6 Student A-P-1 A-P-2 A-W-1 A-W-2 A-W-3 A-W-3 A-W-4 Teaching M-1 Evaluati	Upon comple during the co Case Studies Construction Planning and Lean constru Information n Environmenta Risk manage tworkload - forn Class Particip Exercise prep Class Particip Exercise prep Class Particip Independent Preparation fr Final exam g methods / too Lecture, case ion methods (F	tion of this construction stands and the second standard	age of the project s forms of insta struction manage and strategies ent truction ty ecture content an content an <i>(e, P - final)</i>	t whilst developing i	management			of constru Nu	ction pro	blems hours 15 1 2 2 2 2 2 2 2 3 hours 15 15 15 7 7 7
C-1 Course of T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 Student A-P-1 A-P-1 A-P-2 A-W-1 A-W-2 A-W-1 A-W-3 A-W-4 Teaching M-1 Evaluati S-1	Upon comple during the co Case Studies Construction Planning and Lean constru Information n Environmenta Risk manage tworkload - forn Class Particip Exercise prep Class Particip Exercise prep Class Particip Independent Preparation fr Final exam g methods / too Lecture, case ion methods (F	tion of this construction stands and the second standard	age of the project is forms of insti- struction manage and strategies ent truction ty ecture content an <i>(e, P - final)</i> ment	t whilst developing i	ion			of constru Nu	ction pro	blems hours hours 15 1 2 2 2 2 3 hours 15 15 15 15 15 15 15 15 15 1 1 1 1 1 1

CE_2A_ICM/D/06_W01 Student has the knowledge of tools and techniques of Construction Management during the construction stage of the project whilst developing management solutions for a variety of construction problems.	B-A_2A_W14	P75_WK_TA21	P75_WK_IA21	C-1	T-W-1 T-W-2 T-W-3	T-W-4 T-W-5 T-W-6	M-1	S-1 S-2
Skills								
CE_2A_ICM/D/06_U01 Student is able to: analyze and control construction process	B-A_2A_U23	P7S_UW_TA23		C-1	T-P-1 T-W-1 T-W-2 T-W-3	T-W-4 T-W-5 T-W-6	M-1	S-2
Other social / personal competences								
CE_2A_ICM/D/06_K01 Student is able in both professional and responsible way use gained knowledge and skills in executions works associated with construction management	B-A_2A_K06	P7S_KR		C-1	T-P-1 T-W-1 T-W-2 T-W-3	T-W-4 T-W-5 T-W-6	M-1	S-1 S-2
Required reading								
1. Daniel W. Halpin, Bolivar A. Senior, Gunnar Lucko, Con	struction manag	gement, Wiley	, 2017					

ī						7	
Field of s	study	Civil E	Engineering				
Mode of s	study	statio	nary	Level	second cycle		
Graduate	e's qualification	magis	ster			WBi/	4
Area(s) o	of study	nauki	techniczne				·
Educatio	nal profile	gener	al academic				
Module							n ILn I
Course u	ınit	Susta	ainable Desig	n and Environme	ental Engineering	_	
Code		WBIA/	S2CE/ICM/D/10	-1		- L	
Field of s	specialisation			iction Managemer			
Administ	ering faculty		ra Mieszkalnict ektury	wa i Podstaw Tech	nniczno-Ekologicznycł		
ECTS		4,0		ECTS (forms)	4,0		
Form of a	course credit	exami	ination	Language	english		
Electives	5	7		Elective group			
Form of i	instruction	Code	Semester	Hours	ECTS	Weight	Credit
project c	ourse	Р	2	30	2,0	0,50	credits
lecture		W	2	30	2,0	0,50	examination
Leading t	teacher	Janusz	zkiewicz Krysty	na (Krystyna.Janu	szkiewicz@zut.edu.pl)	
Other tea	achers	Visitin	ng Professor (Vi	siting@zut.edu.pl)			
Prerequis	sites						
W-1	Intermediate skills environment, and				philosophy of designing		
		SELVICES	, co comply mich c	The principles of soci	al, economic, and ecolog		
Module/c	course unit objectiv	<i>/es</i> urse is ex	xploring innovativ	ve solutions to probl	ems in air, water, and la	nd contaminatior	
Module/c C-1 C-2	Course unit objective The aim of the counce disposal, with cove sustainability, and biological principle The multidiscipline	/ <i>es</i> urse is ex erage of I environ es with e ary appro	xploring innovativ climate change, mental policy. Th ngineering analy pach in Environm	ve solutions to proble environmental risk a nis multidisciplinary sis for environmenta ental Engineering gi		nd contamination ment, green tecl gration of physica tion. se in technical fie	nnologies, al, chemical and Ids related to their
C-1 C-2	Course unit objective The aim of the condisposal, with cove sustainability, and biological principle The multidiscipline own personal inte environmental system	/es urse is ex erage of I environ es with e ary appro rest. The stems thi	xploring innovativ climate change, mental policy. Th ngineering analy pach in Environm e main mission of inking.	ve solutions to proble environmental risk a his multidisciplinary sis for environmenta ental Engineering gi this course is to bui	ems in air, water, and la assessment and manage field is requiring an integ al protection and restora ves the student expertis	nd contamination ment, green tecl gration of physica tion. se in technical fie	nnologies, al, chemical and lds related to their mplementation of
C-1 C-2	Course unit objective The aim of the counce disposal, with cove sustainability, and biological principle The multidiscipline own personal inte environmental system	ves urse is ex erage of l environ es with e ary appro rest. The stems thi	xploring innovativ climate change, mental policy. Th ngineering analy bach in Environm main mission of inking. s forms of instr	ve solutions to proble environmental risk a nis multidisciplinary sis for environmenta ental Engineering gi this course is to bui uction	ems in air, water, and la assessment and manage field is requiring an integ al protection and restora ves the student expertis ld the designers own int	nd contamination ment, green tect gration of physica tion. se in technical fie erpretation and i	nnologies, al, chemical and Ids related to their
C-1 C-2	Course unit objective The aim of the con- disposal, with cov- sustainability, and biological principle The multidisciplin- own personal inter environmental system content divided inter The task is to desi- use TiO2; public u Szczecin.	/es urse is ex erage of d environ es with e ary appro rest. The stems thi o variou: ign an en se object	xploring innovativ climate change, mental policy. Th ngineering analy pach in Environm e main mission of inking. s forms of instr nvironmental stru t in a municipaliit	ve solutions to proble environmental risk a is multidisciplinary sis for environmenta ental Engineering gi this course is to bui uction cture to an air purifi cy with an attractive	ems in air, water, and la assessment and manage field is requiring an integ al protection and restora ves the student expertis ld the designers own int cation in highly- urbaniz busy city landscape, e.g	nd contamination ment, green tech gration of physica tion. se in technical fie erpretation and i ed area with g. the city of	nnologies, al, chemical and lds related to their mplementation of
C-1 C-2 Course co	Course unit objective The aim of the con- disposal, with cov- sustainability, and biological principle The multidisciplin- own personal inter environmental system content divided inter The task is to desing use TiO2; public un Szczecin.	/es urse is ex erage of d environ es with e ary appro rest. The stems thi o variou: ign an en se object ion of su:	xploring innovative climate change, mental policy. The ngineering analyse oach in Environme main mission of inking. <i>s forms of instr</i> est invironmental strut t in a municipaliit stainable design	ve solutions to proble environmental risk a sis multidisciplinary sis for environmenta ental Engineering gi this course is to bui uction cture to an air purifi cy with an attractive - how to "eliminate	ems in air, water, and la assessment and manage field is requiring an integ al protection and restora ves the student expertis ld the designers own int cation in highly- urbaniz busy city landscape, e.g negative environmental	nd contamination ment, green tech gration of physica tion. se in technical fie erpretation and i ed area with g. the city of	nnologies, al, chemical and lds related to their mplementation of <i>Number of hours</i>
C-1 C-2 Course co T-P-1	Course unit objective The aim of the con- disposal, with cove sustainability, and biological principle The multidiscipline own personal inter environmental system content divided inter State to design use TiO2; public un Szczecin. What is the intenter completely througe The Philosophy of	/es urse is ex erage of d environ es with e ary appro rest. The stems thi o variou. ign an en se object ion of su gh skillful Sustaina	xploring innovative climate change, mental policy. The ngineering analyse pach in Environme main mission of inking. <i>s forms of instru-</i> nvironmental strut t in a municipaliit stainable design sensitive design able Design - design	ve solutions to proble environmental risk a is multidisciplinary i sis for environmenta ental Engineering gi this course is to bui uction cture to an air purifi cy with an attractive - how to "eliminate " - the basic principl	ems in air, water, and la assessment and manage field is requiring an integ al protection and restora ves the student expertis ld the designers own int cation in highly- urbaniz busy city landscape, e.g negative environmental	nd contamination ment, green tech gration of physica- tion. se in technical fie erpretation and i ed area with g. the city of impact	nnologies, al, chemical and lds related to their mplementation of <i>Number of hours</i> 30
C-1 C-2 Course co T-P-1 T-W-1	Course unit objective The aim of the con- disposal, with cov- sustainability, and biological principle The multidisciplin- own personal inter environmental system content divided inter The task is to desi use TiO2; public un Szczecin. What is the intent completely throug The Philosophy of the environmental	/es urse is ex erage of d environ es with e ary appro rest. The stems thi o variou. ign an en se object ion of su h skillful Sustaina Ily-friend	xploring innovativ climate change, mental policy. Th ingineering analy bach in Environm e main mission of inking. s forms of instru- nvironmental stru t in a municipaliit stainable design sensitive design able Design - desi lly architecture.	ve solutions to proble environmental risk a is multidisciplinary i sis for environmenta ental Engineering gi this course is to bui uction cture to an air purifi cy with an attractive - how to "eliminate " - the basic principl	ems in air, water, and la assessment and manage field is requiring an integ al protection and restora ves the student expertis ld the designers own int cation in highly- urbaniz busy city landscape, e.g negative environmental es. nment - the sustainable	nd contamination ment, green tech gration of physica- tion. se in technical fie erpretation and i ed area with g. the city of impact	nnologies, al, chemical and Ids related to their mplementation of <i>Number of hours</i> 30 2
C-1 C-2 Course co T-P-1 T-W-1 T-W-2	Course unit objective The aim of the con- disposal, with cov- sustainability, and biological principle The multidisciplin- own personal inter environmental system content divided inter The task is to desing use TiO2; public un Szczecin. What is the intent completely throug The Philosophy of the environmenta Energy aspects in The multi-criteria sustainable design quality, providing	/es urse is ex erage of d environ es with e ary appro rest. The stems thi o various ign an en se object ion of sus dh skillful Sustaina Ily-friend sustaina evaluation n. The bu accurate	xploring innovative climate change, mental policy. The ngineering analyse pach in Environme main mission of inking. <i>s forms of instru-</i> nvironmental strut t in a municipaliit stainable design sensitive design able Design - desi ly architecture. able design - rene pon of design solut idding information e quantity take-of	ve solutions to proble environmental risk a his multidisciplinary i sis for environmenta ental Engineering gi this course is to bui uction cture to an air purifi y with an attractive - how to "eliminate " - the basic principli igning for the Enviro ewable energy sourc tions using specialize n modeling (BIM) as	ems in air, water, and la assessment and manage field is requiring an integ al protection and restora ves the student expertis ld the designers own int cation in highly- urbaniz busy city landscape, e.g negative environmental es. nment - the sustainable	nd contamination ment, green tech gration of physica- tion. se in technical fie erpretation and i ed area with g. the city of impact buildings and n the process of otal project	nnologies, al, chemical and Ids related to their mplementation of <i>Number of hours</i> 30 2 2 2
C-1 C-2 Course co T-P-1 T-W-1 T-W-2 T-W-3	Course unit objective The aim of the con- disposal, with cov- sustainability, and biological principle The multidisciplin- own personal inter environmental system content divided inter The task is to desi- use TiO2; public ur Szczecin. What is the intent completely throug The Philosophy of the environmenta Energy aspects in The multi-criteria sustainable design quality, providing total project conti What is the intent water, and land cor risk assessment a	/es urse is ex erage of d environ es with e ary appro- rest. The stems thi o variou. ign an en se object ion of su gh skillful Sustaina lly-friend sustaina evaluation n. The bu accurate ngencies ion of en ontamina nd mana	xploring innovativ climate change, mental policy. The ngineering analy pach in Environme main mission of inking. <i>s forms of instr</i> nvironmental strut t in a municipaliit stainable design sensitive design able Design - desi ly architecture. able design - rene on of design solut illding information e quantity take-of and costs. vironmental engination and waste d	ve solutions to proble environmental risk a is multidisciplinary i sis for environmenta ental Engineering gi this course is to bui uction cture to an air purifi cy with an attractive - how to "eliminate " - the basic principli igning for the Enviro wable energy source cions using specialize modeling (BIM) as ifs, and improving so ineering - exploring lisposal, with covera echnologies, sustain	ems in air, water, and la assessment and manage field is requiring an integ al protection and restora ves the student expertis ld the designers own int cation in highly- urbaniz busy city landscape, e.g negative environmental es. nment - the sustainable es. ed computer programs i a means of increasing t heduling, consequently innovative solutions to p ge of climate change, er ability, and environment	nd contamination ment, green teck gration of physica- tion. se in technical file erpretation and i ed area with j. the city of impact buildings and n the process of otal project diminishing problems in air, nvironmental cal policy.	nnologies, al, chemical and Ids related to their mplementation of Number of hours 30 2 2 2 2
C-1 C-2 Course co T-P-1 T-W-1 T-W-2 T-W-3 T-W-4	Course unit objective The aim of the con- disposal, with cov- sustainability, and biological principle The multidisciplin- own personal inter environmental system content divided inter The task is to desi- use TiO2; public ur Szczecin. What is the intent completely throug The Philosophy of the environmenta Energy aspects in The multi-criteria sustainable design quality, providing total project conti What is the intent water, and land cor- risk assessment a The climate change changeable clima	<i>Ves</i> urse is exercised of a environ es with e ary appro- rest. The stems thi o variou. ign an en se object ion of su- gh skillful Sustaina lly-friend sustaina evaluation n. The bu accurate ngencies ion of en ontamina nd mana ge oriento te charao	xploring innovative climate change, mental policy. The ngineering analyse pach in Environme main mission of inking. <i>s forms of instru-</i> nvironmental strue t in a municipalite stainable design sensitive design able Design - desi ly architecture. able design - rene on of design solute illding information e quantity take-of and costs. vironmental engination and waste design defined cteristics and eco	ve solutions to problenvironmental risk a nis multidisciplinary i sis for environmental risk a ental Engineering gi this course is to bui fuction cture to an air purification cture to an air purification with an attractive - how to "eliminate - the basic principli igning for the Enviro wable energy source cons using specialize modeling (BIM) as fs, and improving so ineering - exploring lisposal, with covera echnologies, sustain d as an adjustment of logy- methods and p	ems in air, water, and la assessment and manage field is requiring an integ al protection and restoratives ves the student expertise ld the designers own int cation in highly- urbanize busy city landscape, e.go negative environmental es. nment - the sustainable es. ed computer programs in a means of increasing t sheduling, consequently innovative solutions to p ge of climate change, er ability, and environment of conditions compatible practice - case study.	nd contamination ment, green teck gration of physica- tion. se in technical file erpretation and i ed area with j. the city of impact buildings and n the process of otal project diminishing problems in air, nvironmental cal policy. with	nnologies, al, chemical and Ids related to their mplementation of Number of hours 30 2 2 2 2 2 2
C-1 C-2 Course co T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5	Course unit objective The aim of the con- disposal, with cov- sustainability, and biological principle The multidisciplin- own personal inter environmental system content divided inter The task is to desi- use TiO2; public ur Szczecin. What is the intent completely throug The Philosophy of the environmenta Energy aspects in The multi-criteria sustainable design quality, providing total project conti What is the intent water, and land cor risk assessment a The climate chang changeable climai The low-carbon building.	<i>Ves</i> urse is exercised of a environ es with e ary appro- rest. The stems thi o variou. ign an en- se object ion of su- gh skillful Sustaina lly-friend sustaina evaluatio n. The bu accurate ngencies ion of en- ontamina nd mana ge oriented te characo uilding - co	xploring innovative climate change, mental policy. The ngineering analyse pach in Environme main mission of inking. <i>s forms of instru-</i> nvironmental strue t in a municipaliit stainable design sensitive design sensitive design able Design - desi ly architecture. able design - rene on of design solute ilding information e quantity take-of and costs. vironmental engi ation and waste d agement, green te ed design defined cteristics and eco different approact	ve solutions to proble environmental risk a is multidisciplinary i sis for environmenta ental Engineering gi this course is to bui uction cture to an air purifi cy with an attractive - how to "eliminate " - the basic principli igning for the Enviro wable energy source tions using specialize n modeling (BIM) as ifs, and improving so ineering - exploring lisposal, with covera echnologies, sustain d as an adjustment of logy- methods and p hes to assessing the	ems in air, water, and la assessment and manage field is requiring an integ al protection and restora ves the student expertis ld the designers own int cation in highly- urbaniz busy city landscape, e.g negative environmental es. nment - the sustainable es. ed computer programs i a means of increasing t sheduling, consequently innovative solutions to p ge of climate change, er ability, and environment of conditions compatible practice - case study.	nd contamination ment, green teck gration of physica- tion. Se in technical file erpretation and i ed area with j. the city of impact buildings and n the process of otal project diminishing problems in air, nvironmental cal policy. with utes a low-	nnologies, al, chemical and Ids related to their mplementation of Number of hours 30 2 2 2 2 2 2 2 2 2 2
C-1 C-2 Course co T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6	Course unit objective The aim of the con- disposal, with cov- sustainability, and biological principle The multidisciplin- own personal inter environmental system content divided inter The task is to desi- use TiO2; public ur Szczecin. What is the intent completely throug The Philosophy of the environmenta Energy aspects in The multi-criteria sustainable design quality, providing total project conti What is the intent water, and land con- risk assessment a The climate change changeable climar The low-carbon building. An experimental a particular building	/es urse is ex erage of l environ es with e ary appro- rest. The stems thi o variou. ign an en se object ion of su- gn skillful Sustaina lly-friend sustaina evaluation n. The bu accurate ngencies ion of en ontamina nd mana ge oriente te characo uilding - co and CFD i g.	xploring innovative climate change, mental policy. The ngineering analyse pach in Environme main mission of inking. <i>s forms of instre</i> nvironmental strutt in a municipaliit stainable design sensitive design able Design - design able Design - design able design - rene on of design solutt ilding information e quantity take-of a and costs. vironmental engi ation and waste d iggement, green te ed design defined cteristics and eco different approact	ve solutions to proble environmental risk a is multidisciplinary i sis for environmenta ental Engineering gi this course is to bui uction cture to an air purifi cy with an attractive - how to "eliminate " - the basic principli igning for the Enviro wable energy source tions using specialized n modeling (BIM) as ifs, and improving so ineering - exploring isposal, with covera echnologies, sustain d as an adjustment of logy- methods and p hes to assessing the o the mixing in a close	ems in air, water, and la assessment and manage field is requiring an integ al protection and restora ves the student expertis ld the designers own int cation in highly- urbaniz busy city landscape, e.g negative environmental es. nment - the sustainable es. ed computer programs i a means of increasing t cheduling, consequently innovative solutions to p ge of climate change, er ability, and environment of conditions compatible practice - case study. criteria of what constitu- sed system to reduce wi	nd contamination ment, green teck gration of physica- tion. Se in technical file erpretation and i ed area with g. the city of impact buildings and n the process of otal project diminishing problems in air, nvironmental cal policy. with utes a low- nd loads for a	nnologies, al, chemical and Ids related to their mplementation of Number of hours 30 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
C-1 C-2 Course co T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-5 T-W-6 T-W-7	Course unit objective The aim of the con- disposal, with cov- sustainability, and biological principle The multidisciplin- own personal inter environmental system content divided inter The task is to desi- use TiO2; public under Szczecin. What is the intentrice completely througe The Philosophy of the environmental Energy aspects in The multi-criteria sustainable design quality, providing total project conti What is the intentrice water, and land coc risk assessment a The climate change changeable climater The Climate respondifferent parametrice to try different control	Ves urse is ex- erage of d environ es with e ary appro- rest. The stems thi o variou. ign an en se object ion of su- gh skillful Sustaina Ily-friend sustaina evaluation. The bu accurate ngencies ion of en ontamina nd mana ge oriente te characo uilding - co and CFD i posive bu ers like b	kploring innovativ climate change, mental policy. The ingineering analy bach in Environme main mission of inking. <i>s forms of instru-</i> vironmental strut t in a municipaliit stainable design sensitive design able Design - desi lly architecture. able design - rene on of design solut ilding information e quantity take-of and costs. vironmental engination and waste d agement, green te ed design defined cteristics and eco different approac investigation into investigation into and of these buildi	ve solutions to proble environmental risk a sis multidisciplinary i sis for environmenta ental Engineering gi this course is to bui uction cture to an air purifi- cy with an attractive - how to "eliminate I " - the basic principl igning for the Enviro ewable energy source tions using specialize n modeling (BIM) as ifs, and improving so ineering - exploring isposal, with covera echnologies, sustain d as an adjustment of logy- methods and p hes to assessing the o the mixing in a close - an attempt to und a, orientation, percer ing parameters help	ems in air, water, and la assessment and manage field is requiring an integ al protection and restora ves the student expertis ld the designers own int cation in highly- urbaniz busy city landscape, e.g negative environmental es. nment - the sustainable es. ed computer programs i a means of increasing t sheduling, consequently innovative solutions to p ge of climate change, er ability, and environment of conditions compatible practice - case study.	nd contamination ment, green teck gration of physica- tion. se in technical file erpretation and i ed area with g. the city of impact buildings and n the process of otal project diminishing problems in air, nvironmental cal policy. with utes a low- nd loads for a e effect of the designers erent	nnologies, al, chemical and Ids related to their mplementation of Number of hours 30 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
C-1 C-2 Course co T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-5 T-W-6 T-W-7 T-W-8	Course unit objection The aim of the con- disposal, with cov- sustainability, and biological principle The multidisciplin. own personal inter environmental system content divided inter The task is to desi- use TiO2; public und Szczecin. What is the intentric completely throug The Philosophy of the environmental Energy aspects in The multi-criteria sustainable design quality, providing total project conti What is the intentric water, and land con- risk assessment and The climate change changeable climain The Climate respondifferent parameter to try different con- combinations of th The climate respond and the lack of de- implementation in	<i>Ves</i> urse is exerage of d environ es with e ary appro- rest. The stems thi o variou. ign an en se object ion of su- gh skillful Sustaina Ily-friend sustaina evaluation. The bu accurate ngencies ion of en ontamina nd mana ge oriente te characo uilding - o and CFD i b mbination nese buil- nsive buil- nsive buil-	kploring innovativ climate change, mental policy. The ingineering analy bach in Environme main mission of inking. <i>s forms of instru-</i> vironmental strut t in a municipaliit stainable design sensitive design able Design - desi lly architecture. able design - rene on of design solut ilding information e quantity take-of and costs. vironmental engi ation and waste d igement, green te ed design definee cteristics and eco different approac investigation into silding envelopes sons of these buildi ding parameters ilding design stra knowledge on the ign process.	ve solutions to proble environmental risk a sis multidisciplinary i sis for environmental ental Engineering gi this course is to bui uction cture to an air purifi cy with an attractive - how to "eliminate " - the basic principli igning for the Enviro ewable energy source cions using specialize n modeling (BIM) as ifs, and improving so ineering - exploring isposal, with covera echnologies, sustain d as an adjustment of logy- methods and p hes to assessing the o the mixing in a close - an attempt to und s, orientation, percer ing parameters help to reduce heat load tegies and their bar e synthesis of design	ems in air, water, and la assessment and manage field is requiring an integ al protection and restora ves the student expertis ld the designers own int cation in highly- urbaniz busy city landscape, e.g megative environmental es. nment - the sustainable es. ed computer programs i a means of increasing t cheduling, consequently innovative solutions to p ge of climate change, er ability, and environment of conditions compatible practice - case study. e criteria of what constitu- sed system to reduce will erstand and quantify the thage fenestrations, help the designers to try diff	nd contamination ment, green teck gration of physica- tion. se in technical file erpretation and i ed area with g. the city of impact buildings and n the process of otal project diminishing problems in air, nvironmental al policy. with utes a low- nd loads for a e effect of the designers erent g. tive character and	nnologies, al, chemical and Ids related to their mplementation of Number of hours 30 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2

Course c	ontent o	divided into various forms of instru	uction					Num	ber of	hours
T-W-12	Air an cities.	d water pollutions a worldwide probler	m - research revi	iew into an air	and water pu	irificatio	on in big			2
T-W-13	The g	obal climate change - disasters and h er's impact to cities - designs form mo		ictures to harv	vester plants r	reduce				2
T-W-14	The g	obal climate change - rainwater harve and agriculture water problems.		astructures to	collect rainw	ater in a	a big			2
T-W-15	The g	lobal climate change - food security - i al farming.	nfrastructures to	o an agricultur	al production	in a big	cities -			2
Student		d - forms of activity						Num	ber of	hours
A-P-1		ipation in lectures								30
A-P-2	Desig	n work								30
A-W-1	Partic	ipation in lectures and participation in	discussions							30
A-W-2	The st	udy required and supplementary read	lings							30
Teaching	g metho	ds / tools								
М-1	solutio	res with Power Point presentations by ons to problems in air, water, and land onmental risk assessment and manage	l contamination a	and waste disp	bosal, with cov	verage	of climat	e chan	ge,	วท
М-2	The ce	entral teaching strategy associated wi m present ongoing projects work, disc	th the design pro	ocess is regula	r, tutor-led, d					tudent
Evaluatio	on meth	ods (F - progressive, P - final)								
S-1	Р	Exam								
S-2	Р	Execution of design project								
	Desig	ned learning outcomes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course	content	Teaching methods	Evaluatio methods
Knowled	ge		1							
Design and	Environm Is basic pr	technological conditions of Sustainable ental Engineering their practice. inciples and spatial relations in the l design.	B-A_2A_W02 B-A_2A_W05	P7S_WG_TA21	P75_WG_IA21	C-1 C-2	T-W-3 T-W-4 T-W-5 T-W-6	T-W-10 T-W-11 T-W-12 T-W-13 T-W-14 T-W-15	M-1 M-2	S-1 S-2
B-A_2A_ICM Is able to ac Environmer experiment pursues an	djust the r ntal Engine is and use individual /her appro	nethods if the Sustainable Design and eering to a building design task, s computer software. In his/her work, engineer attitude which is manifested bach to reality the sustainable develionebt	B-A_2A_U11 B-A_2A_U16	P7S_UK P7S_UW_TA24		C-1 C-2	T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6	T-W-10	M-1 M-2	S-1 S-2
Other so	cial / pe	rsonal competences						15		
and criticall	t is poor ir ly assess s	01 demonstration of an ability to evaluate specific Sustainable Design and eering design outcomes.	B-A_2A_K03	P7S_KK		C-1 C-2	T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6	T-W-8 T-W-9 T-W-10 T-W-11 T-W-12 T-W-13 T-W-13 T-W-14 T-W-15	M-1 M-2	S-1 S-2
Requirea										
-		., Multi-layer structural "skins", Case o		-	•					
	-	The Philosophy of Sustainable Design:				-)4			
		ett R.J., Naim M. Seinz H.,, Sustainable					1			
5. Guy S., Routledge	Moore S e, 2014	Alvarez-Cohen L., Environmental Engir . A., Sustainable Architectures: Critica	l Explorations of	Green Buildin	g Practice in I			h Amer	rica,	
7. Januszk architectu 8. Januszk	kiewicz K ural desig kiewicz K	5 W. P., Water Resources Engineering, and Paszkowska N. E., Climate chang In, Go Green, Vienna, 2016, Vol. III, Bo Jarmusz M., Envisioning Urban Farmi OP Conf. Ser.: Mater. Sci. Eng., 2017	je adopted buildi ook 6, Nano, Bio a	ing envelope f and Green Tec	or the urban e	a susta	inable F	uture	•	
Ser.: Mate	ciewicz K er. Sci. Er	reading ., A Climate Change adopted building ng. 245 052094, 2017 s W. P., Water Resources Engineering,				the urb	an envir	onmen	t, IOP C	onf.
3. Goia F.,	, Perino N	 J., Serra V., Zanghirella F., Towards ar pp. 121-136. 				elope, Jo	ournal of	Green	Buildin	<u>j,</u>

Supplementary reading

4. Velikov K., Thün G, Responsive Building Envelopes: Characteristics and Evolving Paradigms. In Design and Construction of High Performance Homes, Routledge Press, London, 2012, pp. 75-91.

5. Journal of Environmental Engineering and Science, 2011, ISSN 1496-2551 | E-ISSN 1496-256X

Field of st	tudy	Civil E	Engineering				
Mode of s	study	statio	nary	Level	second cycle	1	
Graduate	's qualification	magis	ster			WBi/	\
Area(s) of	•		techniczne			VVDI/	٦
Education	-	-	ral academic				
Module		gener				-	
Course ur	nit	Suct	ainable Design	a and Environme	ental Engineering	-	
		-	/S2CE/ICM/D/10			-	
Code					1	- \	
	pecialisation			Iction Managemer		- \	
	ering faculty		Ira Fizyki Budow	vli i Materiałów Bu	-		
ECTS		4,0		ECTS (forms)	4,0	_	
Form of c	ourse credit	exam	ination	Language	english	_	
Electives		7		Elective group			
Form of ir	nstruction	Code	Semester	Hours	ECTS	Weight	Credit
project co	ourse	Р	2	30	2,0	0,50	credits
lecture		W	2	30	2,0	0,50	examination
Leading t	eacher	Kurtz	-Orecka Karolin	⊥ a (Karolina.Kurtz@	ozut edu pl)		
Other tea		Strza		v (Jaroslaw.Strzalk	owski@zut.edu.pl), N	/ygocka-Domag	jałło Agata
Prerequis	itec	Trade	d.Wygoeku@zu				
rierequis	iles						
W-1	Building Materials	Civil Er	naineerina				
W-1 Module/co	Building Materials,	es					
	ourse unit objectiv Knowledge of desi Understanding of k Understanding the Skills of defining m construction for dif	es gn chall ouilding importa nain ene fferent o	enges for a chang energy demands ance of energy me ergy demands of b climates - Ability t	and influance of the odels in design puilding according to to create strategies	edge of modern low-ene erma bridges on hygroth o its features - Skills of fi of energy efficiency incr	nermal behavior of inding proper solu	of partitions -
Module/co C-1 C-2	ourse unit objectiv Knowledge of desig Understanding of b Understanding the Skills of defining m construction for dif and decreasement	es gn chall puilding importa nain ene fferent o c of build	enges for a chang energy demands ance of energy me ergy demands of b climates - Ability t ding environmenta	and influance of the odels in design puilding according to co create strategies al impact - dwellings	erma bridges on hygroth	nermal behavior of inding proper solu	of partitions - utions for gs and their services
Module/co C-1 C-2 Course co	ourse unit objectiv Knowledge of desig Understanding of k Understanding the Skills of defining m construction for dia and decreasement	es gn chall building importa nain ene fferent o c of build variou	enges for a chang energy demands ance of energy me ergy demands of b climates - Ability t ding environments us forms of instru	and influance of the odels in design puilding according to to create strategies al impact - dwellings uction	erma bridges on hygroth o its features - Skills of fi of energy efficiency incr	nermal behavior of inding proper solu	of partitions - utions for gs and their services Number of hours
Module/co C-1 C-2 Course co T-P-1	ourse unit objectiv Knowledge of desig Understanding of k Understanding the Skills of defining m construction for dia and decreasement ontent divided into Design for sustaina	es gn chall building importa nain ene fferent o of build variou ability -	enges for a chang energy demands ance of energy me ergy demands of b climates - Ability t ding environment <i>is forms of instru</i> design for climate	and influance of the odels in design puilding according to to create strategies al impact - dwellings uction	erma bridges on hygroth o its features - Skills of fi of energy efficiency incr	nermal behavior of inding proper solu	of partitions - utions for gs and their services Number of hours 30
Module/co C-1 C-2 Course co T-P-1 T-W-1	ourse unit objectiv Knowledge of desig Understanding of k Understanding the Skills of defining m construction for dif and decreasement ontent divided into Design for sustaina Sustainable develo	es gn chall ouilding importa aain ene fferent o of builo variou ability - opment	enges for a chang energy demands ance of energy me ergy demands of b climates - Ability t ding environmenta <i>is forms of instru</i> design for climate	and influance of the odels in design puilding according to to create strategies al impact - dwellings uction e change	erma bridges on hygroth o its features - Skills of fi of energy efficiency incr	nermal behavior of inding proper solu	of partitions - utions for gs and their services Number of hours 30 2
Module/co C-1 C-2 Course co T-P-1 T-W-1 T-W-2	ourse unit objectiv Knowledge of designed Understanding of k Understanding the Skills of defining m construction for dial and decreasement ontent divided into Design for sustaina Sustainable develor Climate change an	es gn chall puilding importa aain ene fferent c of build variou ability - opment d challe	enges for a chang energy demands ance of energy me ergy demands of b climates - Ability t ding environmenta <i>is forms of instru</i> design for climate enges for the build	and influance of the odels in design puilding according to to create strategies al impact - dwellings uction e change	erma bridges on hygroth o its features - Skills of fi of energy efficiency incr	nermal behavior of inding proper solu	of partitions - utions for gs and their services Number of hours 30 2 2
Module/co C-1 C-2 Course co T-P-1 T-W-1 T-W-2 T-W-3	ourse unit objectiv Knowledge of desig Understanding of b Understanding the Skills of defining m construction for di and decreasement ontent divided into Design for sustaina Sustainable develo Climate change an Contemporary low	es gn chall puilding importa aain ene fferent c c of build variou ability - opment d challe -energy	enges for a chang energy demands ance of energy me ergy demands of b climates - Ability t ding environmenta <i>is forms of instru</i> design for climate enges for the build	and influance of the odels in design puilding according to to create strategies al impact - dwellings uction e change	erma bridges on hygroth o its features - Skills of fi of energy efficiency incr	nermal behavior of inding proper solu	of partitions - utions for gs and their services Number of hours 30 2
Module/co C-1 C-2 Course co T-P-1 T-W-1 T-W-2	ourse unit objectiv Knowledge of desig Understanding of b Understanding the Skills of defining m construction for dii and decreasement ontent divided into Design for sustaina Sustainable develor Climate change an Contemporary low Building energy de Thermal bridges in	es gn chall puilding importa ain ene fferent c c of build variou ability - opment d challe energy mands constru	enges for a change energy demands ance of energy me ergy demands of b climates - Ability t ding environmenta <i>is forms of instru</i> design for climate enges for the build building standard uction - Computat	and influance of the odels in design puilding according to co create strategies al impact - dwellings uction e change ding environment ds	erma bridges on hygroth o its features - Skills of fi of energy efficiency incr	nermal behavior of inding proper solu rement of building utional buildings	of partitions - utions for gs and their services Number of hours 30 2 2 2 2
Module/co C-1 C-2 Course co T-P-1 T-W-1 T-W-2 T-W-3 T-W-4	ourse unit objectiv Knowledge of desig Understanding of b Understanding the Skills of defining m construction for dia and decreasement ontent divided into Design for sustaina Sustainable develo Climate change an Contemporary low Building energy de	es gn chall puilding importa ain ene fferent c c of build variou ability - opment d challe -energy mands c constru f therma	enges for a change energy demands ance of energy me orgy demands of b climates - Ability t ding environmenta <i>is forms of instru</i> design for climate enges for the build building standard uction - Computat al bridges	and influance of the odels in design puilding according to to create strategies al impact - dwellings <i>uction</i> e change ding environment ds	erma bridges on hygroth o its features - Skills of fi of energy efficiency incr s, commercial and instit	nermal behavior of inding proper solu rement of building utional buildings	of partitions - utions for gs and their services Number of hours 30 2 2 2 2 4
Module/co C-1 C-2 Course co T-P-1 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5	ourse unit objectiv Knowledge of desig Understanding of b Understanding the Skills of defining m construction for dir and decreasement ontent divided into Design for sustaina Sustainable develo Climate change an Contemporary low Building energy de Thermal bridges in moisture control of	es gn chall puilding importa ain ene fferent c of build variou ability - opment d challe energy mands constru f therma Buildin	enges for a change energy demands ance of energy me ergy demands of b climates - Ability t ding environmenta <i>is forms of instru</i> design for climate enges for the build building standard uction - Computat al bridges g thermal energy	and influance of the odels in design ouilding according to to create strategies al impact - dwellings <i>uction</i> e change ding environment ds tion of linear therma model	erma bridges on hygroth o its features - Skills of fi of energy efficiency incr s, commercial and instit	nermal behavior of inding proper solu rement of building utional buildings	of partitions - utions for gs and their services Number of hours 30 2 2 2 2 4 4 4
Module/co C-1 C-2 Course co T-P-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6	ourse unit objectiv Knowledge of desig Understanding of b Understanding the Skills of defining m construction for dir and decreasement ontent divided into Design for sustaina Sustainable develor Climate change an Contemporary low Building energy de Thermal bridges in moisture control of Sankey diagrams - Use of renewable r Strategies of energy environmental imp	es gn chall puilding importa- ain ene fferent of of build variou ability - opment d challe -energy mands constru- f therma- Buildin esource gy efficio act - dv	enges for a change energy demands ance of energy mar- ergy demands of b climates - Ability t ding environmenta <i>is forms of instru</i> design for climate enges for the build building standard uction - Computate al bridges g thermal energy es - energy and me ency increment of vellings, commerce	and influance of the odels in design ouilding according to to create strategies al impact - dwellings <i>uction</i> e change ding environment ds tion of linear therma model naterials f buildings and their cial and institutional	erma bridges on hygroth o its features - Skills of fi of energy efficiency incr s, commercial and instit l bridge coefficient - The services and decreaser	ermal behavior of inding proper solution of building utional buildings	of partitions - utions for gs and their services Number of hours 30 2 2 2 2 4 4 4 2
Module/co C-1 C-2 Course co T-P-1 T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-5 T-W-6 T-W-7	ourse unit objectiv Knowledge of desig Understanding of k Understanding the Skills of defining m construction for dif and decreasement ontent divided into Design for sustaina Sustainable develor Climate change an Contemporary low Building energy de Thermal bridges in moisture control of Sankey diagrams - Use of renewable r	es gn chall puilding importa- ain ene fferent of of build variou ability - opment d challe -energy mands constru- f therma- Buildin esource gy efficio act - dv	enges for a change energy demands ance of energy mar- ergy demands of b climates - Ability t ding environmenta <i>is forms of instru</i> design for climate enges for the build building standard uction - Computate al bridges g thermal energy es - energy and me ency increment of vellings, commerce	and influance of the odels in design ouilding according to to create strategies al impact - dwellings <i>uction</i> e change ding environment ds tion of linear therma model naterials f buildings and their cial and institutional	erma bridges on hygroth o its features - Skills of fi of energy efficiency incr s, commercial and instit l bridge coefficient - The services and decreaser	ermal behavior of inding proper solution of building utional buildings	of partitions - utions for gs and their services Number of hours 30 2 2 2 2 4 4 4 2 2 2 2 2 2 2 2 2 2 2 2
Module/co C-1 C-2 Course co T-P-1 T-W-2 T-W-3 T-W-5 T-W-6 T-W-7 T-W-8 T-W-9	ourse unit objectiv Knowledge of desig Understanding of b Understanding the Skills of defining m construction for dir and decreasement ontent divided into Design for sustaina Sustainable develor Climate change an Contemporary low Building energy de Thermal bridges in moisture control of Sankey diagrams - Use of renewable r Strategies of energy environmental imp	es gn chall puilding importa- nain ene fferent of of build variou ability - opment d challe -energy mands constru- f therma Buildin resource gy efficio pact - dv ability -	enges for a change energy demands ance of energy me ergy demands of b climates - Ability t ding environmenta <i>is forms of instru</i> design for climate enges for the build building standard uction - Computat al bridges g thermal energy es - energy and m ency increment of vellings, commerce design for climate	and influance of the odels in design ouilding according to to create strategies al impact - dwellings <i>uction</i> e change ding environment ds tion of linear therma model naterials f buildings and their cial and institutional	erma bridges on hygroth o its features - Skills of fi of energy efficiency incr s, commercial and instit l bridge coefficient - The services and decreaser	ermal behavior of inding proper solution of building utional buildings	of partitions - utions for gs and their services Number of hours 30 2 2 2 2 4 4 4 2 2 2 6 6 6
Module/co C-1 C-2 Course co T-P-1 T-W-2 T-W-3 T-W-5 T-W-5 T-W-6 T-W-7 T-W-8 T-W-9	ourse unit objectiv Knowledge of designed Understanding of been standing of been standing the Skills of defining means Design for sustain Sustainable develoc Climate change and Contemporary low Building energy de Thermal bridges in moisture control of Sankey diagrams - Use of renewable re Strategies of energy environmental imp Design for sustain	es gn chall puilding importa- ain ene fferent of c of build variou ability - opment d challe -energy mands c constru- f therma- Buildin resource gy effici- act - dv ability -	enges for a change energy demands ance of energy me ergy demands of b climates - Ability t ding environmenta <i>is forms of instru</i> design for climate enges for the build building standard uction - Computat al bridges g thermal energy es - energy and m ency increment of vellings, commerce design for climate	and influance of the odels in design ouilding according to to create strategies al impact - dwellings <i>uction</i> e change ding environment ds tion of linear therma model naterials f buildings and their cial and institutional	erma bridges on hygroth o its features - Skills of fi of energy efficiency incr s, commercial and instit l bridge coefficient - The services and decreaser	ermal behavior of inding proper solution of building utional buildings	of partitions - utions for gs and their services Number of hours 30 2 2 2 2 4 4 4 2 2 2 6 6 6
Module/co C-1 C-2 Course co T-P-1 T-W-2 T-W-3 T-W-5 T-W-6 T-W-7 T-W-8 T-W-9 Student w A-P-1	ourse unit objectiv Knowledge of desig Understanding of b Understanding the Skills of defining m construction for dir and decreasement ontent divided into Design for sustaina Sustainable develor Climate change an Contemporary low Building energy de Thermal bridges in moisture control of Sankey diagrams - Use of renewable r Strategies of energy environmental imp Design for sustaina workload - forms of	es gn chall puilding importa- ain ene fferent of c of build variou ability - opment d challe -energy mands c constru- f therma- Buildin resource gy effici- act - dv ability -	enges for a change energy demands ance of energy me ergy demands of b climates - Ability t ding environmenta <i>is forms of instru</i> design for climate enges for the build building standard uction - Computat al bridges g thermal energy es - energy and m ency increment of vellings, commerce design for climate	and influance of the odels in design ouilding according to to create strategies al impact - dwellings <i>uction</i> e change ding environment ds tion of linear therma model naterials f buildings and their cial and institutional	erma bridges on hygroth o its features - Skills of fi of energy efficiency incr s, commercial and instit l bridge coefficient - The services and decreaser	ermal behavior of inding proper solution of building utional buildings	of partitions - utions for gs and their services Number of hours 30 2 2 2 2 4 4 4 2 2 2 6 6 6 <i>Number of hours</i>
Module/co C-1 C-2 Course co T-P-1 T-W-1 T-W-3 T-W-4 T-W-5 T-W-5 T-W-6 T-W-7 T-W-8 T-W-9 Student w A-P-1 A-P-3	ourse unit objectiv Knowledge of designed Understanding of been standing of been standing the standing the standing the standing the standard decreasement on tent divided intoon tent dintoon tent divided intoon tent dintoon ten	es gn chall puilding importa- aain ene fferent of c of build variou ability - opment d challe energy mands c constru- f therma Buildin resource gy effici- aact - dv ability - f activit on	enges for a change energy demands ance of energy market ergy demands of b climates - Ability t ding environmenta <i>is forms of instru</i> design for climate enges for the build building standard uction - Computat al bridges g thermal energy es - energy and m ency increment of vellings, commerce design for climate	and influance of the odels in design ouilding according to to create strategies al impact - dwellings <i>uction</i> e change ding environment ds tion of linear therma model naterials f buildings and their cial and institutional	erma bridges on hygroth o its features - Skills of fi of energy efficiency incr s, commercial and instit l bridge coefficient - The services and decreaser	ermal behavior of inding proper solution of building utional buildings	of partitions - utions for gs and their services Number of hours 30 2 2 2 2 4 4 4 2 2 2 6 6 6 <i>Number of hours</i> 30 25 5
Module/co C-1 C-2 Course co T-P-1 T-W-2 T-W-3 T-W-5 T-W-5 T-W-6 T-W-7 T-W-8 T-W-9 Student w A-P-1 A-P-3 A-W-1	ourse unit objectiv Knowledge of designed Understanding of key understanding of key understanding the Skills of defining metaconstruction for dial and decreasement ontent divided into Design for sustaina Sustainable develot Climate change and Contemporary low Building energy des Thermal bridges in moisture control of Sankey diagrams - Use of renewable restriction Strategies of energy environmental imp Design for sustaina vorkload - forms of Classes participatio Project work Preparing for proje Classes participation	es gn chall puilding importa- nain ene fferent c of build variou ability - opment d challe -energy mands constru- f therma- Buildin resource gy efficie act - dv ability - f activit on	enges for a change energy demands ance of energy market ergy demands of b climates - Ability t ding environmenta <i>is forms of instru</i> design for climate enges for the build building standard uction - Computat al bridges g thermal energy es - energy and m ency increment of vellings, commerce design for climate	and influance of the odels in design ouilding according to to create strategies al impact - dwellings <i>uction</i> e change ding environment ds tion of linear therma model naterials f buildings and their cial and institutional	erma bridges on hygroth o its features - Skills of fi of energy efficiency incr s, commercial and instit l bridge coefficient - The services and decreaser	ermal behavior of inding proper solution of building utional buildings	of partitions - utions for gs and their services Number of hours 30 2 2 2 2 4 4 4 2 2 2 6 6 6 6 <i>Number of hours</i> 30 25 5 30
Module/co C-1 C-2 Course co T-P-1 T-W-2 T-W-3 T-W-5 T-W-6 T-W-7 T-W-8 T-W-9 Student w A-P-1 A-P-3 A-W-1 A-W-1	ourse unit objectiv Knowledge of designed Understanding of been standing of been standing the Skills of defining means Design for sustaina Sustainable develor Climate change and Contemporary low Building energy des Thermal bridges in moisture control of Sankey diagrams - Use of renewable restriction Strategies of energe environmental imp Design for sustaina vorkload - forms of Classes participatio Preparing for projee Classes participation Essays preparation	es gn chall puilding importa- nain ene fferent of of build variou ability - opment d challe -energy mands constru- f therma Buildin esource gy efficio- act of vito on - ct prese on	enges for a change energy demands ance of energy market ergy demands of b climates - Ability t ding environmenta <i>is forms of instru</i> design for climate enges for the build building standard uction - Computat al bridges g thermal energy es - energy and m ency increment of vellings, commerce design for climate	and influance of the odels in design ouilding according to to create strategies al impact - dwellings <i>uction</i> e change ding environment ds tion of linear therma model naterials f buildings and their cial and institutional	erma bridges on hygroth o its features - Skills of fi of energy efficiency incr s, commercial and instit l bridge coefficient - The services and decreaser	ermal behavior of inding proper solution of building utional buildings	of partitions - utions for gs and their services Number of hours 30 2 2 2 2 2 4 4 4 2 2 2 4 4 4 2 2 6 6 6 <i>Number of hours</i> 30 25 5 30 30 15
Module/co C-1 C-2 Course co T-P-1 T-W-2 T-W-3 T-W-5 T-W-5 T-W-6 T-W-7 T-W-8 T-W-9 Student w A-P-1 A-P-3 A-W-1	ourse unit objectiv Knowledge of designed Understanding of key understanding of key understanding the Skills of defining metaconstruction for dial and decreasement ontent divided into Design for sustaina Sustainable develot Climate change and Contemporary low Building energy des Thermal bridges in moisture control of Sankey diagrams - Use of renewable restriction Strategies of energy environmental imp Design for sustaina vorkload - forms of Classes participatio Project work Preparing for proje Classes participation	es gn chall puilding importa- nain ene fferent of of build variou ability - opment d challe -energy mands constru- f therma Buildin esource gy efficio- act of vito on - ct prese on	enges for a change energy demands ance of energy market ergy demands of b climates - Ability t ding environmenta <i>is forms of instru</i> design for climate enges for the build building standard uction - Computat al bridges g thermal energy es - energy and m ency increment of vellings, commerce design for climate	and influance of the odels in design ouilding according to to create strategies al impact - dwellings <i>uction</i> e change ding environment ds tion of linear therma model naterials f buildings and their cial and institutional	erma bridges on hygroth o its features - Skills of fi of energy efficiency incr s, commercial and instit l bridge coefficient - The services and decreaser	ermal behavior of inding proper solution of building utional buildings	of partitions - utions for gs and their services Number of hours 30 2 2 2 2 4 4 4 2 2 2 6 6 6 6 <i>Number of hours</i> 30 25 5 30
Module/co C-1 C-2 Course co T-P-1 T-W-1 T-W-3 T-W-5 T-W-6 T-W-7 T-W-8 T-W-9 Student w A-P-1 A-P-2 A-W-1 A-W-2 A-W-3 Teaching	ourse unit objectiv Knowledge of designed Understanding of been standing of been standing the Skills of defining means Design for sustaina Sustainable develor Climate change and Contemporary low Building energy des Thermal bridges in moisture control of Sankey diagrams - Use of renewable restriction Strategies of energe environmental imp Design for sustaina vorkload - forms of Classes participatio Preparing for projee Classes participation Essays preparation	es gn chall puilding importa- nain ene fferent of of build variou ability - opment d challe -energy mands constru- f therma Buildin esource gy efficio- act of vito on - ct prese on	enges for a change energy demands ance of energy market ergy demands of b climates - Ability t ding environmenta <i>is forms of instru</i> design for climate enges for the build building standard uction - Computat al bridges g thermal energy es - energy and m ency increment of vellings, commerce design for climate	and influance of the odels in design ouilding according to to create strategies al impact - dwellings <i>uction</i> e change ding environment ds tion of linear therma model naterials f buildings and their cial and institutional	erma bridges on hygroth o its features - Skills of fi of energy efficiency incr s, commercial and instit l bridge coefficient - The services and decreaser	ermal behavior of inding proper solution of building utional buildings	of partitions - utions for gs and their services Number of hours 30 2 2 2 2 2 4 4 4 2 2 2 3 0 6 6 6 <i>Number of hours</i> 30 25 5 30 30 15
Module/co C-1 C-2 Course co T-P-1 T-W-1 T-W-3 T-W-4 T-W-5 T-W-6 T-W-7 T-W-8 T-W-9 Student w A-P-1 A-P-2 A-W-1 A-W-2 A-W-3 Teaching M-1	ourse unit objectiv Knowledge of designed Understanding of key understanding of key understanding the Skills of defining metaconstruction for dial and decreasement ontent divided into Design for sustaina Sustainable develot Climate change and Contemporary low Building energy de Thermal bridges in moisture control of Sankey diagrams - Use of renewable result Strategies of energy environmental imp Design for sustaina vorkload - forms of Classes participatio Project work Preparing for proje Classes participatio Preparing for the e	es gn chall puilding importa- nain ene fferent of of build variou ability - opment d challe -energy mands constru- f therma Buildin esource gy efficio- act of vito on - ct prese on	enges for a change energy demands ance of energy market ergy demands of b climates - Ability t ding environmenta <i>is forms of instru</i> design for climate enges for the build building standard uction - Computat al bridges g thermal energy es - energy and m ency increment of vellings, commerce design for climate	and influance of the odels in design ouilding according to to create strategies al impact - dwellings <i>uction</i> e change ding environment ds tion of linear therma model naterials f buildings and their cial and institutional	erma bridges on hygroth o its features - Skills of fi of energy efficiency incr s, commercial and instit l bridge coefficient - The services and decreaser	ermal behavior of inding proper solution of building utional buildings	of partitions - utions for gs and their services Number of hours 30 2 2 2 2 2 4 4 4 2 2 2 3 0 6 6 6 <i>Number of hours</i> 30 25 5 30 30 15
Module/co C-1 C-2 Course co T-P-1 T-W-1 T-W-3 T-W-5 T-W-6 T-W-7 T-W-8 T-W-9 Student w A-P-1 A-P-2 A-W-1 A-W-2 A-W-3 Teaching	ourse unit objectiv Knowledge of designed Understanding of been standing of been standing the Skills of defining means Skills of defining means construction for dial and decreasement ontent divided into Design for sustaina Sustainable develoc Climate change and Contemporary low Building energy des Thermal bridges in moisture control of Sankey diagrams - Use of renewable r Strategies of energe environmental imp Design for sustaina vorkload - forms of Classes participation Project work Preparing for proje Classes participation Preparing for the employed by the standard of th	es gn chall puilding importa- nain ene fferent of of build variou ability - opment d challe -energy mands constru- f therma Buildin esource gy efficio- act of vito on - ct prese on	enges for a change energy demands ance of energy market ergy demands of b climates - Ability t ding environmenta <i>is forms of instru</i> design for climate enges for the build building standard uction - Computat al bridges g thermal energy es - energy and m ency increment of vellings, commerce design for climate	and influance of the odels in design ouilding according to to create strategies al impact - dwellings <i>uction</i> e change ding environment ds tion of linear therma model naterials f buildings and their cial and institutional	erma bridges on hygroth o its features - Skills of fi of energy efficiency incr s, commercial and instit l bridge coefficient - The services and decreaser	ermal behavior of inding proper solution of building utional buildings	of partitions - utions for gs and their services Number of hours 30 2 2 2 2 2 4 4 4 2 2 2 3 0 6 6 6 <i>Number of hours</i> 30 25 5 30 30 15

Toachir	ng metho	ds / tools								
M-4	-	resentation								
Evaluat	tion meth	ods (F - progressive, P - final)								
S-1	F	Project work								
5-1 5-2	' '	Essays								
5-2 5-3	F	Oral presentation								
5-5 5-4	P	· ·								
		Written exam								
S-5	P	Project work	-							-
	Desig	ned learning outcomes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Cours	e content	Teaching methods	Evaluation methods
Knowle	dge									
Has the ki knowledge understan therma br	e of moderr nds of buildi ridges on hy	V01 f design challenges for a changing climate l low-energy buildings design standards - ng energy demands and influance of grothermal behavior of partitions - ortance of energy models in design	B-A_2A_W05 B-A_2A_W09 B-A_2A_W13	P75_WG_TA21	P7S_WG_IA21	C-1	T-W-1 T-W-2 T-W-3 T-W-4 T-W-5	T-W-6 T-W-7 T-W-8 T-W-9	M-1 M-3	S-2 S-4
Skills										
Has skills according constructi strategies services a	to its featu ion for differ of energy e and decreas	01 main energy demands of building res, skills of finding proper solutions for ent climates, has ability to create efficiency increment of buildings and their ement of building environmental impact - al and institutional buildings	B-A_2A_U01 B-A_2A_U09 B-A_2A_U10	P7S_UK P7S_UW_TA21	P7S_UW_IA21	C-2	T-P-1 T-W-3 T-W-5	T-W-6 T-W-8	M-2 M-4	S-1 S-3
Other s	ocial / pe	rsonal competences		•		<u>,</u>				
Is able pro	CM/D/11-3_K ofessionally accomplishm	01 define, classify and apply the priorities nent of an undertaken engineering task	B-A_2A_K01	Р75_КК		C-1 C-2	T-P-1 T-W-1 T-W-2 T-W-5	T-W-6 T-W-7 T-W-8 T-W-9	M-2 M-3	S-2 S-5
Require	ed reading	g			•	•1	1			
1. Edwar	rds B., Rou	igh Guide to Sustainability - 3rd Editic	on, RIBA Pablishin	ig, London, 20	10					
2. Guzov	wski M., To	wards Zero-energy Architecture - New	w Solar Design, L	aurence King	Publishing, Lo	ndon, 2	010			
		ns M., Stark T., Zeumer M., Energy Ma		5				Basel, B	Boston, I	3erlin,
4. Jonsto Newtowi		son S., Toward a Zero Energy Home -	A complete Guic	le to Energy S	elf-Sufficiency	ı at Hor	ne, The	Taunto	n Press,	

Field of stu	udy		Civil E	Engineering							
Mode of st	tudy		statio	nary	Level	second	cycle				
Graduate's	s qualit	ication	magis	ster				V	VBiA		
Area(s) of	•		-	techniczne				v	VDIA		
Education		le		ral academic				1 🗖			
Module			gene						- 11		
Course un	.:+		Inno	ative Develor	monto in Cor	struction			- 11	미ビ	11
				vative Develop		istruction		- I.	- 11	r	i I
Code				/S2CE/ICM/D/11				1	- 11		
Field of sp				national Constru	-	hent					
Administe	ring fac	culty		d Teorii Konstru	ıkcji						
ECTS			3,0		ECTS (forms)	3,0					
Form of co	ourse ci	redit	exam	ination	Language	english					
Electives					Elective group)					
Form of in	structio	วท	Code	Semester	Hours		ECTS	We	eight	Credi	t
project co	urse		Р	2	15		1,5	0	,50	credit	S
lecture			w	2	30		1,5	-	,50	examina	ition
	aachar			– lewski Tomasz (-			
Leading te Other tead			Abrar	nowicz Małgorza	ata (Malgorzata	a.Abramowic	z@zut.edu.p				ka
			(Agni	eszka.Pelka-Saw	venko@zut.edu	.pl), Visiting	Professor (\	/isiting	@zut.edu.	pl)	
Prerequisi W-1		dae of basic	iccuor	in the field of cor	croto tochnolog	(and 2D CAD	modoling				
		-					modeling				
		nit objective			· · · · · ·						
C-1				erstanding of the a		ples of constru	uction.				
Course co				s forms of instru					Λ	lumber of	[:] hours
T-P-1	-	•		prefabricated cons	struction element						15
T-W-1		ed 3D BIM mo									6
T-W-2		n pre-fabrica									6
T-W-3	-	nting in cons		1							6
T-W-4		uction-Site R									6
T-W-5		-		Reality application	s for constructior	1					6
Student w	orkload	I - forms of	activit	ty					Λ	lumber of	hours
A-P-1		pation in clas									15
A-P-2				lesign assignment	t						30
A-W-1		pation in lect	ures								30
A-W-2		ure study									10
A-W-3	-	an exam									5
Teaching I											
M-1 M-2	Lecture										
											
	1		-	/e, P - final)							
S-1 S-2	P P	Passing the		lled assignment							
5-2		ned learning			Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course conte	nt Teaching methods	
	Desigr										
Knowleda											
	e /07_W01 has know			lutions used in the	B-A_2A_W13	P7S_WG_TA21	P7S_WG_IA21	C-1	T-W-1 T-W T-W-2 T-W T-W-3		S-1

CE_2A_ICM/D/07_U01 The student is able to apply innovative solutions for the design of prefabricated structural elements	B-A_2A_U19	P7S_UW_TA24	C-1	T-P-1	M-2	5-2
Other social / personal competences						
CE_2A_ICM/D/07_K01 Student has awareness of the need for individual studying and upgrading professional skills	B-A_2A_K02 B-A_2A_K03	P7S_KK	C-1	T-P-1 T-W-3 T-W-1 T-W-4 T-W-2 T-W-5	M-1 M-2	S-1 S-2
Required reading						
1. Andrew Watts, Modern Construction Handbook, Spring	erWienNewYork	c, 2007				

Field of st	udy	Civil E	Engineering				
Mode of s	tudy	statio	nary	Level	second cycle		
Graduate	's qualification	magis	ster			WBi/	Δ
Area(s) of	[•] study	nauki	techniczne				<u>`</u>
Education	al profile	gener	al academic				
Module							
Course ur	nit	Adva	nced Geoengi	neering			
Code		WBIA					
Field of sp	pecialisation	Intern	national Constru	iction Manageme	ent		
-	ering faculty		lra Geotechniki				
ECTS	5 5	2,0		ECTS (forms)	2,0		
	ourse credit	credit		Language	english		
Electives				Elective group	crightin		
	atruction	Codo	Semester		FCTC	Maiabt	Cradit
Form of ir		Code		Hours	ECTS	Weight	Credit
project co	urse	P	2	15	1,0	0,50	credits
lecture		W	2	15	1,0	0,50	credits
Leading to				munt.Meyer@zu			
Other tea	chers	Szme	chel Grzegorz (Grzegorz.Szmec	nel@zut.edu.pl), Vis	iting Professor (V	isiting@zut.edu.pl)
Prerequis	ites						
W-1	Advanced soil r						
W-2	Basic of bulidin	g mechanic	CS				
Module/co	ourse unit objed						
C-1	Familiarize the complex geoted	student wit chnical con	th various founda ditions	tion load systems,	teach him how to des	ign special foundati	on elements in
			s forms of instr				Number of hours
T-P-1	-		of the building seg				15
T-W-1			th the pile systen	ו			2
T-W-2	Box foundation	-		and conditions and	difficult geotechnical	conditions in	2
T-W-3			s, masts, wind po		runneur geoteennica		3
T-W-4	Designing foun						3
T-W-5	Foundation of c excavations, ur			objects (bridges, vi	aducts, embankments	s, deep	3
T-W-6		-		objects (wharfs, loo	ks, weirs, breakwater	s)	2
Student w	vorkload - forms	s of activit	tv				Number of hours
A-P-1	participation in		<u>,</u>				15
A-P-2	Docian project	of special f	oundation				15
	Design project	or special in					15
A-W-1	participation in						15
A-W-1 A-W-2		classes					
	participation in	classes literature					15
A-W-2 A-W-3	participation in Own work with	classes literature ration					15 5
A-W-2 A-W-3	participation in Own work with Final test prepa	classes literature iration					15 5
A-W-2 A-W-3 Teaching M-1 M-2	participation in Own work with Final test prepa methods / tools Information lect Case study lect	classes literature tration s ture metho ure metho	d				15 5
A-W-2 A-W-3 Teaching M-1	participation in Own work with Final test prepa methods / tools Information lect	classes literature tration s ture metho ure metho	d				15 5
A-W-2 A-W-3 Teaching M-1 M-2 M-3	participation in Own work with Final test prepa methods / tools Information lect Case study lect	classes literature tration ture metho ure methoo g project m	d d nethod				15 5
A-W-2 A-W-3 Teaching M-1 M-2 M-3 Evaluation S-1	participation in Own work with Final test prepare methods / tools Information lect Case study lect Pracitical design n methods (F -) F Countin	classes literature iration ture metho ure methoo g project m progressiv ous rating o	d d nethod	SS			15 5
A-W-2 A-W-3 Teaching M-1 M-2 M-3 Evaluation	participation in Own work with Final test prepa methods / tools Information lect Case study lect Pracitical design methods (F -)	classes literature iration ture metho ure methoo g project m progressiv ous rating o	d d nethod <i>re, P - final)</i>	SS			15 5

Knowledge								
B-A_2A_ICM/D/08_W01 Student has a thorough knowledge in the field of foundation of objects in variable load conditions and in complex geotechnical conditions. He knows the principles of constructing and dimensioning the foundations of complex structures and building objects.	B-A_2A_W01 B-A_2A_W06 B-A_2A_W09 B-A_2A_W13	P7S_WG_TA21	P75_WG_IA21	C-1	T-W-1 T-W-2 T-W-3	T-W-4 T-W-5 T-W-6	M-1 M-2	S-1 S-2
Skills								
B-A_2A_ICM/D/08_U01 Is able to solve the problems of founding simple and complex buildings in difficult geotechnical conditions by integrating knowledge in the field of various branches of science related to construction	B-A_2A_U01 B-A_2A_U09	P7S_UK P7S_UW_TA21	P7S_UW_IA21	C-1	T-P-1		M-3	S-1
Other social / personal competences								
B-A_2A_ICM/D/08_K01 Student is able to apply the knowledge used in the implementation of the engineering task undertaken in a responsible and professional manner	B-A_2A_K01 B-A_2A_K02	P7S_KK		C-1	T-P-1 T-W-1 T-W-2 T-W-3	T-W-4 T-W-5 T-W-6	M-1 M-2 M-3	S-1 S-2
Required reading								
1. Braja M Das, Introduction to Geotechnical Engineering,	, 1985							
Supplementary reading								
1. German Geotechnical Society, EBGEO- Desing with geo	osynthetics, Wil	ley and Sohn,	2010					

Field of st	udy	(Civil I	Engineering				
Mode of s	tudy	5	static	onary	Level	second cycle		
Graduate	's qualit	ication I	magi	ster	•		WBi/	7
Area(s) of	f study	1	nauki	techniczne			VVDI/	·
Education	al profi	le	gene	ral academic				
Module			5				-	
Course ur	nit		Inter	national Cons	truction		- 1 11	
Code				/S2CE/ICM/D/13			-	
Field of sp	ocialic				ction Managemer	> +	- \	
							- 🔪	
Administe	ering iac			lra Geotechniki				
ECTS			3,0		ECTS (forms)	3,0		
Form of c	ourse ci	redit	exam	ination	Language	english	_	
Electives					Elective group			
Form of ir	nstructio	on (Code	Semester	Hours	ECTS	Weight	Credit
lecturing	course		А	2	30	1,5	0,50	credits
lecture			W	2	15	1,5	0,50	examination
Leading to	eacher		Pozle	wicz Andrzei (Ar	hdrzej.Pozlewicz@	zut.edu.pl)		1
Other tea		1	Nauc	=	@b), Visiting Profe	essor (Visiting@zut.e	du.pl), Wróblew	ski Tomasz
Prerequis	ites		(<u>e - a a a a a a a a a a</u>			
W-1		nowledge of e	econo	mical. social. envi	ronmental issues in	international perspect	ive	
Modulo/co		nit objectives					-	
C-1		-		erspective of desi	gn and construction			
C-2				•	-	ed and developing cour	tries	
Courso co				s forms of instru				Number of hours
Course co						ational construction ma	arket, examples	Number of flours
T-A-1	of good	d practices for	r cons	truction companie	es operating interna	tionally, prepare a writt project on discussed ex	en report on	30
T-W-1	econor	ny on constru	ction	sector. Social and	environmental issu	countries. Effect of loc es from construction co astruction joint venture	ompany	15
1-00-1	strateg	jic alliances. H	low to		tive strategy for int	ernational construction		15
Student w	vorkload	l - forms of a	activi	ty				Number of hours
A-A-1	Attend	ing the tutoria	als					30
A-A-2		,	ernet o	lata bases and lite	erature sources. Che	eck the available data f	or further	6
A-A-3	analys Prepar	ation of writte	en rep	ort				6
A-A-4			•	ment of tutorials				3
A-W-1		ance on lectu						15
A-W-2	Desk s	tudy in the fie	eld of	international aspe	cts of construction	company, structure, ma	anagement.	8
A-W-3	consul	ting with teacl	her					4
A-W-4	Prepar	ation for exam	ninati	on				6
A-W-5	Search	in literature s	source	es, internet data b	ases			10
A-W-6	Oral ex	amination an	d disc	cussion on chosen	issues			2
Teaching	method	ls / tools						
M-1	lecture	emethod						
M-2	interac	tive lecture a	nd pro	oblem method				
М-3	semina	ar and discuss	ion					
Evaluatio	n metho	ods (F - prog	ressi	ve, P - final)				
S-1	F	forming						
5-2	Р	final assessm	nent					
	-							

Designed learning outcomes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course	e content	Teaching methods	Evaluation methods
Knowledge								
B-A_2A_ICM/D/09_W01 To give information to widen horizons about global civil engineering and construction markets. To recognize main aspects of organizing construction company in international environment.	B-A_2A_W07 B-A_2A_W14	P75_WG_TA21 P75_WK_TA21		C-1 C-2	T-A-1	T-W-1	M-1 M-2 M-3	S-1 S-2
Skills								
B-A_2A_ICM/D/09_U01 student is able to recognize main aspects of international market in civil engineering and understands principal rules of running projects internationally	B-A_2A_U16 B-A_2A_U24	P7S_UW_TA22 P7S_UW_TA24		C-1 C-2	T-A-1	T-W-1	M-1 M-2 M-3	S-1 S-2
Other social / personal competences								
B-A_2A_ICM/D/09_K01 Student understands the need to recognize main problems in construction industry and is able to communicate with international society.	B-A_2A_K08	P75_KO		C-1 C-2	T-A-1	T-W-1	M-1 M-2 M-3	S-2
Required reading								
1. Knovel Data Base in Construction Management								

Field of stu	udy	Civil E	Engineering				
Mode of st	tudy	statio	onary	Level	second cycle		
Graduate's	s qualification	magis	ster			WBi/	7
Area(s) of	study	nauki	techniczne				`
Educationa	al profile	genei	ral academic				
Module							
Course un	it	Unde	erground Struc	tures		-	
Code			 /S2CE/ICM/D/14			-	
Field of sp	ecialisation	Interr	national Constru	ction Management	:		
Administer	ring faculty	Kated	lra Geotechniki				
ECTS		2,0		ECTS (forms)	2,0		
Form of cc	ourse credit	credit	ts	Language	english	_	
Electives			-	Elective group		_	
Form of in	struction	Code	Semester	Hours	ECTS	Weight	Credit
project cou		P	2	15	1,0	0,50	credits
	uise	W	2				
lecture				30	1,0	0,50	credits
Leading te	eacher	-		munt.Meyer@zut.e			
Other teac	chers	(Grze	gorz.Szmechel@		edu.pl), Szmechel Gr ng Professor (Visiting J.pl)		Żarkiewicz
Prerequisit	tes						
W-1	Basic of soil mecha	nics an	nd geotechnical en	igineering			
Module/co	urse unit objective	es					
C-1	Acquainting the stu	udent w	ith complex probl	ems of designing of t	he underground struct	tures	
Course coi	ntent divided into	variou	is forms of instru	uction			Number of hours
							Number of hours
T-P-1	Design exercises fr Designing of suppo		derground structu	res. Design of tunnel	elements. Rocks press	sure calculations.	15
T-W-1	Designing of suppo Introduction to und	ort syste legroun	derground structur em and tunnel cor id structures. Type	res. Design of tunnel Istruction process. es of undeground stru		sure calculations.	15
T-W-1 T-W-2	Designing of suppo Introduction to und Shape of the cross	ort syste legroun section	derground structur em and tunnel cor id structures. Type n. Excavation and s	res. Design of tunnel hstruction process. es of undeground stru support systems.		sure calculations.	15 4 2
T-W-1	Designing of suppo Introduction to und Shape of the cross Methods of tunneli	ort syste legroun section ng and	derground structur em and tunnel cor id structures. Type h. Excavation and structures underground strue	res. Design of tunnel Istruction process. es of undeground stru support systems. ctures constructions.	uctures.		15
T-W-1 T-W-2	Designing of suppo Introduction to und Shape of the cross Methods of tunneli	ort syste legroun section ng and . Excav	derground structur em and tunnel cor nd structures. Type n. Excavation and s underground stru- ration methods. Ne	res. Design of tunnel Istruction process. es of undeground stru support systems. ctures constructions.			15 4 2
T-W-1 T-W-2 T-W-3	Designing of suppo Introduction to und Shape of the cross Methods of tunnelin Opencast methods	ort syste legroun sectior ng and . Excav hnologi	derground structur em and tunnel cor nd structures. Type n. Excavation and struc- underground struc- ration methods. Ne ies.	res. Design of tunnel Istruction process. es of undeground stru support systems. ctures constructions.	uctures.		15 4 2 4
T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6	Designing of suppo Introduction to und Shape of the cross Methods of tunnelin Opencast methods tunneling: TBM tec Rock behaviour in t Monitoring and risk	ert syste legroun section ng and . Excav hnologi tunnelin c manag	derground structur em and tunnel con id structures. Type in Excavation and struc- underground struc- ation methods. Ne ies. ing design. gement in undergr	res. Design of tunnel Istruction process. es of undeground stru support systems. ctures constructions. ew Austrian Tunneling round constructions.	uctures. g Method. Continuous		15 4 2 4 6
T-W-1 T-W-2 T-W-3 T-W-5 T-W-6 T-W-7	Designing of suppo Introduction to und Shape of the cross Methods of tunnelii Opencast methods tunneling: TBM tec Rock behaviour in t Monitoring and risk Safety and ventilat	ert syste legroun sectior ng and . Excav hnologi tunnelir a manag ion of t	derground structur em and tunnel cor id structures. Type n. Excavation and struc- underground struc- tation methods. Ne- tes. ing design. gement in undergr unnels. Technical	res. Design of tunnel hstruction process. es of undeground stru support systems. ctures constructions. ew Austrian Tunneling round constructions. infrastructure, lightin	uctures. g Method. Continuous		15 4 2 4 6 6 4 2 2 4
T-W-1 T-W-2 T-W-3 T-W-5 T-W-6 T-W-7 T-W-8	Designing of suppor Introduction to und Shape of the cross Methods of tunnelin Opencast methods tunneling: TBM tec Rock behaviour in t Monitoring and risk Safety and ventilat Tunnel designing.	ert syste legroun section ng and . Excav hnologi tunnelin c manag ion of t Soils an	derground structur em and tunnel con id structures. Type n. Excavation and s underground struc- ration methods. Ne ies. ng design. gement in undergr unnels. Technical id rocks pressure o	res. Design of tunnel Istruction process. es of undeground stru support systems. ctures constructions. ew Austrian Tunneling round constructions. infrastructure, lightin on support systems.	g Method. Continuous	mechanised	15 4 2 4 6 4 2 2 4 2
T-W-1 T-W-2 T-W-3 T-W-5 T-W-6 T-W-7 T-W-8 T-W-9	Designing of suppor Introduction to und Shape of the cross Methods of tunnelin Opencast methods tunneling: TBM tec Rock behaviour in t Monitoring and risk Safety and ventilat Tunnel designing. S Socio-economic ad	ert syste legroun section ng and . Excav hnologi tunnelin c manag ion of t Goils an vantag	derground structur em and tunnel cor id structures. Type n. Excavation and s underground struc- ration methods. Ne ies. ng design. gement in undergr unnels. Technical id rocks pressure c es of uderground s	res. Design of tunnel Istruction process. es of undeground stru support systems. ctures constructions. ew Austrian Tunneling round constructions. infrastructure, lightin on support systems.	uctures. g Method. Continuous	mechanised	15 4 2 4 6 6 4 2 2 4 2 2 2
T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-5 T-W-6 T-W-7 T-W-8 T-W-9 Student we	Designing of suppor Introduction to und Shape of the cross Methods of tunnelin Opencast methods tunneling: TBM tec Rock behaviour in the Monitoring and risk Safety and ventilat Tunnel designing. S Socio-economic ad orkload - forms of	ert syste legroun section ng and . Excav hnologi tunnelin c manag ion of t Goils an vantag	derground structur em and tunnel cor id structures. Type n. Excavation and s underground struc- ration methods. Ne ies. ng design. gement in undergr unnels. Technical id rocks pressure c es of uderground s	res. Design of tunnel Istruction process. es of undeground stru support systems. ctures constructions. ew Austrian Tunneling round constructions. infrastructure, lightin on support systems.	g Method. Continuous	mechanised	15 4 2 4 4 6 4 2 2 4 2 2 2 Number of hours
T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-5 T-W-6 T-W-7 T-W-7 T-W-8 T-W-9 Student wo A-P-1	Designing of suppor Introduction to und Shape of the cross Methods of tunnelin Opencast methods tunneling: TBM tec Rock behaviour in t Monitoring and risk Safety and ventilat Tunnel designing. S Socio-economic ad orkload - forms of Presence at class	ert syste legroun sectior ng and . Excav hnologi tunnelir c manag ion of t Soils an vantag	derground structur em and tunnel cor id structures. Type n. Excavation and struc- underground struc- ration methods. Ne- ies. ng design. gement in undergr unnels. Technical id rocks pressure of es of uderground s ty	res. Design of tunnel Istruction process. es of undeground stru support systems. ctures constructions. ew Austrian Tunneling round constructions. infrastructure, lightin on support systems.	g Method. Continuous	mechanised	15 4 2 4 4 6 4 2 2 4 2 2 2 <i>Number of hours</i> 15
T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-5 T-W-5 T-W-6 T-W-7 T-W-8 T-W-9 Student wo A-P-1 A-P-2	Designing of suppor Introduction to und Shape of the cross Methods of tunnelin Opencast methods tunneling: TBM tec Rock behaviour in the Monitoring and risk Safety and ventilat Tunnel designing. S Socio-economic ad <i>orkload - forms of</i> Presence at class Design project of u	ert syste legroun sectior ng and . Excav hnologi tunnelir c manag ion of t Soils an vantag	derground structur em and tunnel cor id structures. Type n. Excavation and struc- underground struc- ration methods. Ne- ies. ng design. gement in undergr unnels. Technical id rocks pressure of es of uderground s ty	res. Design of tunnel Istruction process. es of undeground stru support systems. ctures constructions. ew Austrian Tunneling round constructions. infrastructure, lightin on support systems.	g Method. Continuous	mechanised	15 4 2 4 4 6 4 2 4 2 2 2 2 <i>Number of hours</i> 15 15
T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-5 T-W-6 T-W-7 T-W-7 T-W-8 T-W-9 Student wo A-P-1	Designing of suppor Introduction to und Shape of the cross Methods of tunnelin Opencast methods tunneling: TBM tec Rock behaviour in t Monitoring and risk Safety and ventilat Tunnel designing. S Socio-economic ad orkload - forms of Presence at class	ert syste legroun section ng and . Excav hnologi tunnelin c manag ion of t 50ils an vantage <i>activiti</i> ndergro	derground structur em and tunnel cor id structures. Type n. Excavation and struc- underground struc- ration methods. Ne- ies. ng design. gement in undergr unnels. Technical id rocks pressure of es of uderground s ty	res. Design of tunnel Istruction process. es of undeground stru support systems. ctures constructions. ew Austrian Tunneling round constructions. infrastructure, lightin on support systems.	g Method. Continuous	mechanised	15 4 2 4 4 6 4 2 2 4 2 2 2 <i>Number of hours</i> 15
T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-5 T-W-6 T-W-7 T-W-8 T-W-9 Student wo A-P-1 A-P-2 A-W-1	Designing of suppor Introduction to und Shape of the cross Methods of tunnelin Opencast methods tunneling: TBM tec Rock behaviour in the Monitoring and risk Safety and ventilat Tunnel designing. S Socio-economic ad orkload - forms of Presence at class Design project of u Presence at class	ert syste legroun sectior ng and . Excav hnologi tunnelir a manag ion of t Soils an vantag <i>activit</i> ndergro	derground structur em and tunnel cor id structures. Type n. Excavation and s underground struc- ration methods. Ne ies. ng design. gement in undergr unnels. Technical id rocks pressure of es of uderground s ty ound structure.	res. Design of tunnel Istruction process. es of undeground stru support systems. ctures constructions. ew Austrian Tunneling round constructions. infrastructure, lightin on support systems. structures. Tunnels in	g Method. Continuous	mechanised	15 4 2 4 4 6 4 4 2 4 2 2 2 1 2 1 5 15 15
T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-5 T-W-6 T-W-7 T-W-8 T-W-7 T-W-8 T-W-9 Student wo A-P-1 A-P-2 A-W-1 A-W-2	Designing of suppor Introduction to und Shape of the cross Methods of tunnelin Opencast methods tunneling: TBM tec Rock behaviour in t Monitoring and risk Safety and ventilat Tunnel designing. S Socio-economic ad orkload - forms of Presence at class Design project of u Presence at class Own work with liter	ert syste legroun sectior ng and . Excav hnologi tunnelir c manag ion of t Soils an vantage diactivit ndergro rature o be pre	derground structur em and tunnel cor id structures. Type n. Excavation and s underground struc- ration methods. Ne ies. ng design. gement in undergr unnels. Technical id rocks pressure of es of uderground s ty ound structure.	res. Design of tunnel Istruction process. es of undeground stru support systems. ctures constructions. ew Austrian Tunneling round constructions. infrastructure, lightin on support systems. structures. Tunnels in	g Method. Continuous	mechanised	15 4 2 4 4 6 4 2 4 2 2 4 2 2 2 <i>Number of hours</i> 15 15 15 15
T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-5 T-W-5 T-W-7 T-W-8 T-W-7 T-W-8 T-W-9 Student wo A-P-1 A-P-2 A-W-1 A-W-2 A-W-1 A-W-2 A-W-3 A-W-4	Designing of suppor Introduction to und Shape of the cross Methods of tunnelin Opencast methods tunneling: TBM tec Rock behaviour in the Monitoring and risk Safety and ventilat Tunnel designing. S Socio-economic ad <i>orkload - forms of</i> Presence at class Design project of u Presence at class Own work with liter Presentation has to	ert syste legroun sectior ng and . Excav hnologi tunnelir c manag ion of t Soils an vantage diactivit ndergro rature o be pre	derground structur em and tunnel cor id structures. Type n. Excavation and s underground struc- ration methods. Ne ies. ng design. gement in undergr unnels. Technical id rocks pressure of es of uderground s ty ound structure.	res. Design of tunnel Istruction process. es of undeground stru support systems. ctures constructions. ew Austrian Tunneling round constructions. infrastructure, lightin on support systems. structures. Tunnels in	g Method. Continuous	mechanised	15 4 2 4 4 6 4 2 4 2 4 2 2 2 2 <i>Number of hours</i> 15 15 15 15 5 5
T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-5 T-W-5 T-W-7 T-W-8 T-W-7 T-W-8 T-W-9 Student wo A-P-1 A-P-2 A-W-1 A-W-2 A-W-1 A-W-2 A-W-3 A-W-4	Designing of suppor Introduction to und Shape of the cross Methods of tunnelin Opencast methods tunneling: TBM tec Rock behaviour in t Monitoring and risk Safety and ventilat Tunnel designing. S Socio-economic ad orkload - forms of Presence at class Design project of u Presence at class Own work with liter Presentation has to	ert syste legroun sectior ng and . Excav hnologi tunnelir c manag ion of t Soils an vantage diactivit ndergro rature o be pre	derground structur em and tunnel cor id structures. Type n. Excavation and s underground struc- ration methods. Ne ies. ng design. gement in undergr unnels. Technical id rocks pressure of es of uderground s ty ound structure.	res. Design of tunnel Istruction process. es of undeground stru support systems. ctures constructions. ew Austrian Tunneling round constructions. infrastructure, lightin on support systems. structures. Tunnels in	g Method. Continuous	mechanised	15 4 2 4 4 6 4 2 4 2 4 2 2 2 2 <i>Number of hours</i> 15 15 15 15 5 5
T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-5 T-W-5 T-W-6 T-W-7 T-W-8 T-W-7 T-W-8 T-W-9 Student wo A-P-1 A-P-2 A-P-1 A-P-2 A-W-1 A-W-2 A-W-3 A-W-4 Teaching r	Designing of suppor Introduction to und Shape of the cross Methods of tunnelin Opencast methods tunneling: TBM tec Rock behaviour in the Monitoring and risk Safety and ventilat Tunnel designing. S Socio-economic ad <i>orkload - forms of</i> Presence at class Design project of u Presence at class Own work with liter Presentation has to Preparation for fina	ert syste legroun sectior ng and . Excav hnologi tunnelir a managi ion of t Soils an vantage <i>activiti</i> ndergro rature b be pre- al test e	derground structur em and tunnel cor id structures. Type n. Excavation and s underground struc- ration methods. Ne ies. ng design. gement in undergr unnels. Technical id rocks pressure of es of uderground s ty ound structure.	res. Design of tunnel Istruction process. es of undeground stru support systems. ctures constructions. ew Austrian Tunneling round constructions. infrastructure, lightin on support systems. structures. Tunnels in	g Method. Continuous	mechanised	15 4 2 4 4 6 4 2 4 2 4 2 2 2 2 <i>Number of hours</i> 15 15 15 15 5 5
T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-5 T-W-5 T-W-7 T-W-8 T-W-7 T-W-8 T-W-7 Student wo A-P-1 A-P-2 A-W-1 A-P-2 A-W-1 A-W-2 A-W-3 A-W-3 A-W-4 Teaching r M-1 M-2	Designing of suppor Introduction to und Shape of the cross Methods of tunnelin Opencast methods tunneling: TBM tec Rock behaviour in the Monitoring and risk Safety and ventilat Tunnel designing. S Socio-economic ad orkload - forms of Presence at class Design project of u Presence at class Own work with liter Presentation has to Preparation for fina methods / tools Lectures method	ert syste legroun sectior ng and . Excav hnologi tunnelir c manag ion of t Soils an vantagu f activit ndergro rature b be pre- al test e	derground structur em and tunnel cor id structures. Type h. Excavation and stru- ration methods. Ne- res. ng design. gement in undergr unnels. Technical id rocks pressure of es of uderground s ty ound structure.	res. Design of tunnel Istruction process. es of undeground stru support systems. ctures constructions. ew Austrian Tunneling round constructions. infrastructure, lightin on support systems. structures. Tunnels in	g Method. Continuous	mechanised	15 4 2 4 4 6 4 2 4 2 4 2 2 2 2 <i>Number of hours</i> 15 15 15 15 5 5
T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-5 T-W-5 T-W-7 T-W-8 T-W-7 T-W-8 T-W-7 Student wo A-P-1 A-P-2 A-W-1 A-P-2 A-W-1 A-W-2 A-W-3 A-W-3 A-W-4 Teaching r M-1 M-2	Designing of suppor Introduction to und Shape of the cross Methods of tunnelin Opencast methods tunneling: TBM tec Rock behaviour in the Monitoring and risk Safety and ventilat Tunnel designing. S Socio-economic ad orkload - forms of Presence at class Design project of u Presence at class Own work with liter Presentation has to Preparation for fina methods / tools Lectures method Project design met	ert syste legroun sectior ng and . Excav hnologi tunnelir a managi ion of t Soils an vantage <i>i activit</i> ndergro rature b be pre- al test e hod	derground structur em and tunnel cor id structures. Type h. Excavation and stru- ration methods. Ne- res. ng design. gement in undergr unnels. Technical id rocks pressure of es of uderground s ty ound structure.	res. Design of tunnel Istruction process. es of undeground stru support systems. ctures constructions. ew Austrian Tunneling round constructions. infrastructure, lightin on support systems. structures. Tunnels in	g Method. Continuous	mechanised	15 4 2 4 4 6 4 2 4 2 4 2 2 2 2 3 <i>Number of hours</i> 15 15 15 15 5 5

Designed learning outcomes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course content	Teaching methods	Evaluation methods
Knowledge							
B-A_2A_ICM/D/10_W01 The student learns to solve complex geotechnical problems by himself by extending his knowledge about soil and rock mechanics and underground structures	B-A_2A_W05 B-A_2A_W07 B-A_2A_W08 B-A_2A_W10 B-A_2A_W13	P7S_WG_TA21	P7S_WG_IA21	C-1	T-W-1 T-W-4 T-W-2 T-W-5 T-W-3	M-1 M-2	S-1 S-2
Skills							
B-A_2A_ICM/D/10_U01 Student can design the underground structures in complex geotechnical conditions	B-A_2A_U01 B-A_2A_U11 B-A_2A_U16	P7S_UK P7S_UW_TA24		C-1	T-W-6 T-W-8	M-2	S-1
Other social / personal competences							
B-A_2A_ICM/D/10_K01 He can work with a group to achieve the desired engeneering effect.	B-A_2A_K03 B-A_2A_K04	P7S_KK		C-1	T-W-9	M-1 M-2	S-1
Required reading							
1. Pietro Lunardi, Design and construction of tunnels, Sp	ringer-Verlag Be	rlin Heidelberg	g, Italy, 2008				
3. Otis Williams, Engineering and Design TUNNELS AND Washington, Washington, 1997	SHAFTS IN ROCK	, Department	of the Army l	J.S. Arm	y Corps of Eng	ineers	
4. ITA WG Mechanized Tunnelling, Recommendations ar aites.org, 2000	d Guidelines for	Tunnel Boring	Machines (TE	BMs), by	/ ITA - AITES, w	ww.ita-	
5. John A. Hudson, John P. Harrison, Engineering Rock M Lausanne - New York - Oxford - Shannon - Singapore - T		oduction for th	ne Principles,	ELSEVIE	R SCIENCE, An	nsterda	m -

Supplementary reading

2. Giulia Viggiani, Geotechnical Aspects of Underground Construction in Soft Ground, CRC Preis Taylor & Francis, New York, 2013

Field of s	study	Civil I	Engineering				
Mode of	study	statio	onary	Level	second cycle		
Graduate	e's qualification	magi	ster	I		WBi/	2
Area(s) c	of studv	nauki	i techniczne			vv Di/	7
	onal profile	-	ral academic				
Module		gene					
Course u	unit	Ctural	hogic Managon	ant in Construe	tion		
	IIIIC	_		nent in Construe	LION		
Code			/S2CE/ICM/D/15				
Field of s	specialisation			ction Managemer			
	tering faculty	Budo	wnictwie	-	izacji i Zarządzania w		
ECTS		3,0		ECTS (forms)	3,0		
Form of	course credit	exam	nination	Language	english		
Electives	5			Elective group			
Form of	instruction	Code	Semester	Hours	ECTS	Weight	Credit
lecturing	g course	Α	2	30	1,5	0,50	credits
lecture	·	W	2	30	1,5	0,50	examination
Leading	teacher	Arasz			kiewicz@zut.edu.pl)	-,	
Other tea				Sikora@zut.edu.p	• • •		
)		
Prerequi			· ·				
Prerequi: W-1	Knowledge of the	basics o	of management				
W-1	Knowledge of the course unit objectiv	'es					
W-1	Knowledge of the course unit objectiv	<i>es</i> rentiate	basic theories fro	om strategic manag to scrutinize select	ement, to discuss them, t ed issues of modern top i	o conduct analy nanagement	vses on industry
W-1 Module/c C-1	Knowledge of the course unit objectiv To be able to diffe forces and busines	<i>res</i> rentiate ss mode	basic theories frc	to scrutinize select	ement, to discuss them, t ed issues of modern top i	o conduct analy nanagement	-
W-1 Module/c C-1	Knowledge of the course unit objectiv To be able to diffe forces and busines content divided into	res rentiate ss mode variou	basic theories fro conceptions and conceptions of instru-	to scrutinize select	ed issues of modern top i	o conduct analy nanagement	vses on industry Number of hours 8
W-1 Module/c C-1 Course c	Knowledge of the course unit objectiv To be able to diffe forces and busines content divided into	<i>res</i> rentiate ss mode variou macro-	basic theories fro conceptions and <i>s forms of instru</i> environment anal	to scrutinize select uction ysis of the selected	ed issues of modern top i	o conduct analy management	Number of hours
W-1 Module/c C-1 Course c T-A-1	Knowledge of the course unit objectiv To be able to diffe forces and busines content divided into Preparation of the Preparation of the	<i>res</i> rentiate ss mode variou macro- chosen	basic theories fro conceptions and <i>s forms of instru</i> environment anal company's strate	to scrutinize select uction ysis of the selected	ed issues of modern top i company	o conduct analy management	Number of hours 8
W-1 Module/c C-1 Course c T-A-1 T-A-2	Knowledge of the Course unit objectiv To be able to diffe forces and busines Content divided into Preparation of the Preparation of the Case studies - stra	res rentiate ss mode variou macro- chosen ategies o	e basic theories fro el conceptions and us forms of instru- environment anal company's strate of selected compa	to scrutinize select uction ysis of the selected gy	ed issues of modern top i company ion industry	o conduct analy management	Number of hours 8 10
W-1 Module/c C-1 Course c T-A-1 T-A-2 T-A-3	Knowledge of the Course unit objectiv To be able to diffe forces and busines Content divided into Preparation of the Preparation of the Case studies - stra	rentiate ss mode o variou macro- chosen ategies o r a selec	basic theories fro conceptions and <i>Is forms of instru</i> environment analy company's strate of selected compa ted company fron	to scrutinize select uction ysis of the selected gy nies from construct	ed issues of modern top i company ion industry	o conduct analy management	Number of hours 8 10 8
W-1 Module/c C-1 Course c T-A-1 T-A-2 T-A-3 T-A-3	Knowledge of the Course unit objective To be able to diffe forces and busines content divided into Preparation of the Preparation of the Case studies - strate Marketing plan for Completion of the	res rentiate ss mode variou macro- chosen ategies a selec excerci	basic theories fro conceptions and <i>is forms of instru</i> environment anal company's strate of selected compa ted company fron sers	to scrutinize select uction ysis of the selected gy nies from construct	ed issues of modern top i company ion industry idustry	o conduct analy management	Number of hours 8 10 8 3
W-1 Module/c C-1 Course c T-A-1 T-A-2 T-A-3 T-A-4 T-A-5	Knowledge of the course unit objective To be able to diffe forces and busines content divided into Preparation of the Preparation of the Case studies - strate Marketing plan for Completion of the Introduction to the Review of the main	res rentiate ss mode variou macro- chosen ategies a selec excerci e course n schoo	basic theories fro conceptions and <i>Is forms of instru</i> environment anal company's strate of selected compa ted company fron sers : Competitive adv ls of thought abou	to scrutinize select uction ysis of the selected gy nies from construct n the construction ir rantages and busine	ed issues of modern top i company ion industry idustry	o conduct analy management	Number of hours 8 10 8 3 1
W-1 Module/c C-1 Course c T-A-1 T-A-2 T-A-3 T-A-3 T-A-4 T-A-5 T-W-1 T-W-2 T-W-3	Knowledge of the Course unit objective To be able to diffe forces and busines content divided into Preparation of the Preparation of the Case studies - strate Marketing plan for Completion of the Introduction to the Review of the main Developing new bit	rentiate s mode variou macro- chosen ategies o a selec excerci e course n schoo usiness	e basic theories fro el conceptions and <i>is forms of instru</i> environment analy company's strate of selected compa ted company fron sers :: Competitive adv ls of thought abou models	to scrutinize select uction ysis of the selected gy nies from construct n the construction ir antages and busine it strategy making	ed issues of modern top i company ion industry idustry	o conduct analy management	Number of hours 8 10 8 3 1 2 4 4
W-1 Module/c C-1 Course c T-A-1 T-A-2 T-A-3 T-A-3 T-A-4 T-A-5 T-W-1 T-W-1 T-W-2 T-W-3 T-W-3 T-W-4	Knowledge of the course unit objective To be able to differe forces and business content divided into Preparation of the Preparation of the Case studies - strate Marketing plan for Completion of the Introduction to the Review of the main Developing new bit Corporate diversifier	Yes rentiate ss mode variou macro- chosen ategies a selec excerci e course n schoo usiness ication:	e basic theories fro el conceptions and us forms of instru- environment analy company's strate of selected compa- ted company fron sers :: Competitive adv ls of thought abou models The concept of re	to scrutinize select uction ysis of the selected gy inies from construct in the construction ir rantages and busine it strategy making latedness	ed issues of modern top i company ion industry ndustry ss models	o conduct analy nanagement	Number of hours 8 10 8 11 2 4 2 4 2
W-1 Module/c C-1 Course c T-A-1 T-A-2 T-A-3 T-A-4 T-A-5 T-W-1 T-W-2 T-W-2 T-W-3 T-W-4 T-W-5	Knowledge of the Course unit objective To be able to diffe forces and busines content divided into Preparation of the Preparation of the Case studies - stration Marketing plan for Completion of the Introduction to the Developing new bit Corporate diversified Industry analysis at	rentiate ss mode variou macro- chosen ategies a selec excerci e course n schoo usiness ication: and new	basic theories fro conceptions and <i>is forms of instru</i> environment analy company's strate of selected compa ted company from sers : Competitive adv ls of thought abou models The concept of re business models	to scrutinize select uction ysis of the selected gy nies from construct n the construction ir antages and busine it strategy making latedness in the construction	ed issues of modern top i company ion industry ndustry ss models	o conduct analy management	Number of hours 8 10 8 10 8 1 2 4 2 4 2 4 2 4 2 4 2 4
W-1 Module/c C-1 Course c T-A-1 T-A-2 T-A-3 T-A-4 T-A-5 T-W-1 T-W-2 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6	Knowledge of the Course unit objective To be able to diffe forces and busines content divided into Preparation of the Preparation of the Case studies - strate Marketing plan for Completion of the Introduction to the Developing new be Corporate diversifier Industry analysis at Strategic and cult	rentiate s mode variou macro- chosen ategies a selec excerci e course n schoo usiness ication: and new ural cha	e basic theories fro l conceptions and us forms of instru- environment analy company's strate of selected compa- ted company fron sers : Competitive adv ls of thought abou models The concept of re business models nge – the case stu	to scrutinize select uction ysis of the selected gy nies from construct n the construction ir antages and busine it strategy making latedness in the construction idies	ed issues of modern top i company ion industry ndustry ss models industry	o conduct analy management	Number of hours 8 10 8 10 8 1 2 4 2 4 2 4 3 3
W-1 Module/c C-1 Course c T-A-1 T-A-2 T-A-3 T-A-4 T-A-5 T-W-1 T-W-2 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-5 T-W-6 T-W-7	Knowledge of the course unit objective To be able to diffe forces and busines content divided into Preparation of the Preparation of the Case studies - strate Marketing plan for Completion of the Introduction to the Review of the main Developing new bit Corporate diversified Industry analysis at Strategic and culture Developing and im	Yes rentiate ss mode variou macro- chosen ategies a selec excerci e course n schoo usiness ication: and new ural cha applemer	e basic theories fro el conceptions and us forms of instru- environment analy company's strate of selected compa- ted company fron sers :: Competitive adv ls of thought abou models The concept of re business models nge - the case stu- nting sustainable s	to scrutinize select uction ysis of the selected gy unies from construct n the construction ir rantages and busine it strategy making latedness in the construction	ed issues of modern top i company ion industry ndustry ss models industry	o conduct analy management	Number of hours 8 10 8 10 8 11 2 4 2 4 2 4 3 3 2 4 3 2 4 3 2 4 3 2
W-1 Module/c C-1 Course c T-A-1 T-A-2 T-A-3 T-A-4 T-A-5 T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-5 T-W-6 T-W-7 T-W-8	Knowledge of the Course unit objective To be able to diffe forces and busines content divided into Preparation of the Preparation of the Case studies - strat Marketing plan for Completion of the Introduction to the Review of the main Developing new br Corporate diversifier Industry analysis a Strategic and culture Developing and im The role of top ma	rentiate s mode variou macro- chosen ategies o a selec e course n schoo usiness ication: and new ural cha nplemer nageme	e basic theories fro el conceptions and us forms of instru- environment analy company's strate of selected compa- ted company fron sers :: Competitive adv ls of thought abou models The concept of re business models nge – the case stu- nting sustainable s ent teams	to scrutinize select uction ysis of the selected gy nies from construct n the construction in antages and busine it strategy making latedness in the construction idies strategies (and busin	ed issues of modern top i company ion industry ndustry ss models industry	o conduct analy management	Number of hours 8 10 8 10 8 11 2 4 2 4 2 4 3 2 4 2 4 2 4 2
W-1 Module/c C-1 Course c T-A-1 T-A-2 T-A-3 T-A-4 T-A-5 T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-5 T-W-6 T-W-7 T-W-8 T-W-9	Knowledge of the Course unit objective To be able to diffe forces and busines content divided into Preparation of the Preparation of the Case studies - strate Marketing plan for Completion of the Introduction to the Review of the main Developing new bit Corporate diversified Industry analysis at Strategic and culture Developing and im The role of top ma Supply chain analysis	rentiate s mode variou macro- chosen ategies a selec excerci e course n schoo usiness ication: and new ural cha nplemer nageme ysis. Tec	e basic theories fro el conceptions and us forms of instru- environment analy company's strate of selected compa- ted company fron sers : Competitive adv ls of thought abou models The concept of re business models nge – the case stu- nting sustainable s ent teams chniques for strate	to scrutinize select uction ysis of the selected gy mies from construct in the construction ir antages and busine it strategy making latedness in the construction idies strategies (and busine egic planning.	ed issues of modern top i company ion industry ndustry ss models industry	o conduct analy management	Number of hours 8 10 8 10 8 11 2 4 2 4 2 4 3 2 4 2 4 2 4 3 2 2 4 3 2 4 3 2 4
W-1 Module/c C-1 Course c T-A-1 T-A-2 T-A-3 T-A-4 T-A-5 T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-5 T-W-6 T-W-7 T-W-8 T-W-9 T-W-10	Knowledge of the Course unit objective To be able to diffe forces and busines content divided into Preparation of the Preparation of the Case studies - strat Marketing plan for Completion of the Introduction to the Review of the main Developing new br Corporate diversified Industry analysis at Strategic and culture Developing and im The role of top made Supply chain analy Marketing in const	Yes rentiate ss mode variou macro- chosen ategies a selec e course n schoo usiness ication: and new ural cha nplemer nageme ysis. Tec	e basic theories fro el conceptions and is forms of instru- environment analy company's strate of selected compa- ted company fron sers :: Competitive adv ls of thought abou models The concept of re business models nge - the case stu- nting sustainable s ent teams chniques for strate industry - interna	to scrutinize select uction ysis of the selected gy mies from construct in the construction ir antages and busine it strategy making latedness in the construction idies strategies (and busine egic planning.	ed issues of modern top i company ion industry ndustry ss models industry	o conduct analy management	Number of hours 8 10 8 10 8 10 8 11 2 4 4 2 4 3 2 4 3 2 4 3 2 4 3 2 4 3 2 4 2 2 4 2 2 2 2 2 2 2 2 2 2 4 2 4 2 4 2 4 2 3 3 3 3 4 2
W-1 Module/c C-1 Course c T-A-1 T-A-2 T-A-3 T-A-4 T-A-5 T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-5 T-W-6 T-W-5 T-W-5 T-W-6 T-W-7 T-W-8 T-W-9 T-W-10 T-W-11	Knowledge of the Course unit objective To be able to diffe forces and busines content divided into Preparation of the Preparation of the Case studies - strate Marketing plan for Completion of the Introduction to the Review of the main Developing new bit Corporate diversified Industry analysis at Strategic and culture Developing and im The role of top ma Supply chain analy Marketing in const Completion of the	Yes rentiate ss mode variou macro- chosen ategies a selec excerci e course n schoo usiness ication: and new ural cha nplemer nagemer ysis. Tec ruction lectures	e basic theories fro el conceptions and us forms of instru- environment analy company's strate of selected compa- ted company fron sers :: Competitive adv ls of thought abou models The concept of re business models nge - the case stu- ting sustainable s ent teams chniques for strate industry - interna	to scrutinize select uction ysis of the selected gy mies from construct in the construction ir antages and busine it strategy making latedness in the construction idies strategies (and busine egic planning.	ed issues of modern top i company ion industry ndustry ss models industry	o conduct analy management	Number of hours 8 10 8 10 8 10 8 10 8 10 8 10 10 10 10 11 12 4 4 1 2 4 3 2 4 2 4 2 4 2 2 4 2 4 2 2 4 2 1
W-1 Module/c C-1 Course c T-A-1 T-A-2 T-A-3 T-A-4 T-A-5 T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-5 T-W-6 T-W-5 T-W-5 T-W-6 T-W-7 T-W-8 T-W-9 T-W-10 T-W-11	Knowledge of the Course unit objective To be able to diffe forces and busines content divided into Preparation of the Preparation of the Case studies - strat Marketing plan for Completion of the Introduction to the Review of the main Developing new br Corporate diversified Industry analysis at Strategic and culture Developing and im The role of top made Supply chain analy Marketing in const	Yes rentiate ss mode variou macro- chosen ategies a selec excerci e course n schoo usiness ication: and new ural cha nplemer nageme ysis. Tec rruction lectures f activi	e basic theories fro el conceptions and is forms of instru- environment analy company's strate of selected compa- ted company fron sers :: Competitive adv ls of thought abou models The concept of re business models nge - the case stu- nting sustainable s ent teams chniques for strate industry - interna s	to scrutinize select uction ysis of the selected gy mies from construct in the construction ir antages and busine it strategy making latedness in the construction idies strategies (and busine egic planning.	ed issues of modern top i company ion industry ndustry ss models industry	o conduct analy management	Number of hours 8 10 8 10 8 3 1 2 4 2 4 2 4 3 2 4 3 2 4 3 2 4 3 2 4 3 2 4 2 2 4 2 2 4 2 2 2 2 2 4 2 4 2 4 2 4 2 4 2 3 4 4 4 4<
W-1 Module/c C-1 Course c T-A-1 T-A-2 T-A-3 T-A-4 T-A-5 T-W-1 T-W-2 T-W-3 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 T-W-5 T-W-6 T-W-7 T-W-8 T-W-9 T-W-10 T-W-11 Student	Knowledge of the Course unit objective To be able to diffe forces and busines content divided into Preparation of the Preparation of the Case studies - strat Marketing plan for Completion of the Introduction to the Review of the main Developing new bit Corporate diversifit Industry analysis at Strategic and culture Developing and im The role of top ma Supply chain analy Marketing in const Completion of the Participation in the	restintes rentiates so wariou macro- chosen ategies o a selec excerci e course n schoo usiness ication: and new ural cha nplemer nageme ysis. Tec ruction lectures f activiti e classe	e basic theories fro el conceptions and us forms of instru- environment analy company's strate of selected compa- ted company fron sers :: Competitive adv ls of thought abou models The concept of re business models nge – the case stu- nting sustainable s ent teams chniques for strate industry – interna s ty s	to scrutinize select uction ysis of the selected gy mies from construct in the construction ir antages and busine it strategy making latedness in the construction idies strategies (and busine egic planning.	ed issues of modern top i company ion industry ndustry ss models industry ness models)	o conduct analy management	Number of hours 8 10 8 10 8 10 8 10 8 10 8 10 10 10 10 11 12 4 2 4 2 4 2 4 2 4 2 4 2 4 2 1 1 Number of hours
W-1 Module/c C-1 Course c T-A-1 T-A-2 T-A-3 T-A-4 T-A-5 T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-5 T-W-6 T-W-7 T-W-6 T-W-7 T-W-8 T-W-9 T-W-10 T-W-10 Student A-A-1	Knowledge of the Course unit objective To be able to diffe forces and busines content divided into Preparation of the Preparation of the Case studies - strat Marketing plan for Completion of the Introduction to the Review of the main Developing new bit Corporate diversifit Industry analysis at Strategic and culture Developing and im The role of top ma Supply chain analy Marketing in const Completion of the Participation in the	Yes rentiate ss mode variou macro- chosen ategies a selec excerci e course n schoo usiness ication: and new ural cha nplemer nagemer ysis. Tec ruction lectures f activir e classe idy, Prej	e basic theories fro el conceptions and is forms of instru- environment analy company's strate of selected compa- ted company fron sers :: Competitive adv ls of thought abou models The concept of re business models nge - the case stu- ting sustainable sent teams chniques for strate industry - interna s ty s paration for comp	to scrutinize select uction ysis of the selected gy anies from construct in the construction in antages and busine at strategy making latedness in the construction idies strategies (and busine strategies (and busine egic planning. tional aspects	ed issues of modern top i company ion industry ndustry ss models industry ness models)	o conduct analy management	Number of hours 8 10 8 10 8 11 2 4 4 4 2 4 2 4 2 4 2 4 2 4 2 4 2 4 2 4 2 1 Number of hours 30
W-1 Module/c C-1 Course c T-A-1 T-A-2 T-A-3 T-A-4 T-A-5 T-W-1 T-W-2 T-W-2 T-W-3 T-W-4 T-W-5 T-W-5 T-W-6 T-W-5 T-W-6 T-W-7 T-W-8 T-W-9 T-W-10 T-W-10 T-W-11 Student A-A-1 A-A-2	Knowledge of the Course unit objective To be able to diffe forces and busines content divided into Preparation of the Preparation of the Case studies - strate Marketing plan for Completion of the Introduction to the Review of the main Developing new bit Corporate diversifie Industry analysis at Strategic and culture Developing and im The role of top ma Supply chain analy Marketing in const Completion of the Own work, self-sture	Yes rentiate ss mode variou macro- chosen ategies a selec excerci e course n schoo usiness ication: and new ural cha nplemer nagemer ysis. Tec ruction lectures f activir e classe idy, Prej	e basic theories fro el conceptions and is forms of instru- environment analy company's strate of selected compa- ted company fron sers :: Competitive adv ls of thought abou models The concept of re business models nge - the case stu- ting sustainable sent teams chniques for strate industry - interna s ty s paration for comp	to scrutinize select uction ysis of the selected gy anies from construct in the construction in antages and busine at strategy making latedness in the construction idies strategies (and busine strategies (and busine egic planning. tional aspects	ed issues of modern top i company ion industry ndustry ss models industry ness models)	o conduct analy management	Number of hours 8 10 8 10 8 10 8 10 8 10 8 10 10 10 10 11 12 4 4 3 2 4 3 2 4 3 2 4 3 1 Number of hours 30 15
W-1 Module/C C-1 Course C T-A-1 T-A-2 T-A-3 T-A-4 T-A-5 T-W-1 T-W-2 T-W-3 T-W-2 T-W-3 T-W-4 T-W-5 T-W-5 T-W-6 T-W-5 T-W-6 T-W-7 T-W-8 T-W-9 T-W-10 T-W-10 Student A-A-1 A-A-2 A-W-1	Knowledge of the Course unit objective To be able to diffe forces and busines content divided into Preparation of the Preparation of the Case studies - strat Marketing plan for Completion of the Introduction to the Neview of the main Developing new brown Corporate diversified Industry analysis and Strategic and culture Developing and im The role of top made Supply chain analy Marketing in constant Completion of the Developing and im The role of top made Supply chain analy Marketing in constant Completion of the Workload - forms of Participation in the Own work, self-sture Participation in cla	Yes rentiate ss mode variou macro- chosen ategies o a selec excerci e course n schoo usiness ication: and new ural cha nplemer nageme ysis. Tec ruction lectures f activi e classe udy, Prej isses, co	e basic theories fro el conceptions and us forms of instru- environment analy company's strate of selected compa- ted company fron sers :: Competitive adv ls of thought abou models The concept of re business models nge – the case stu- nting sustainable s ent teams chniques for strate industry – interna s ty s paration for completion of the le	to scrutinize select uction ysis of the selected gy nies from construct in the construction in antages and busine it strategy making latedness in the construction idies strategies (and busin egic planning. tional aspects	ed issues of modern top i company ion industry ndustry ss models industry ness models)	o conduct analy management	Number of hours 8 10 8 10 8 11 2 4 4 2 4 2 4 2 4 3 2 4 3 2 4 3 2 4 3 2 3 1 Number of hours 30 15 30
W-1 Module/C C-1 Course C T-A-1 T-A-2 T-A-3 T-A-4 T-A-5 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 T-W-7 T-W-6 T-W-7 T-W-6 T-W-7 T-W-8 T-W-9 T-W-10 T-W-10 T-W-10 Student A-A-1 A-A-2 A-W-1 A-W-2 A-W-3	Knowledge of the Course unit objective To be able to diffe forces and busines content divided into Preparation of the Preparation of the Case studies - strat Marketing plan for Completion of the Introduction to the Review of the main Developing new bit Corporate diversified Industry analysis at Strategic and culture Developing and im The role of top mat Supply chain analy Marketing in const Completion of the Workload - forms of Participation in the Own work, self-study	Yes rentiate ss mode variou macro- chosen ategies o a selec excerci e course n schoo usiness ication: and new ural cha nplemer nageme ysis. Tec ruction lectures f activi e classe udy, Prej isses, co	e basic theories fro el conceptions and us forms of instru- environment analy company's strate of selected compa- ted company fron sers :: Competitive adv ls of thought abou models The concept of re business models nge – the case stu- nting sustainable s ent teams chniques for strate industry – interna s ty s paration for completion of the le	to scrutinize select uction ysis of the selected gy nies from construct in the construction in antages and busine it strategy making latedness in the construction idies strategies (and busin egic planning. tional aspects	ed issues of modern top i company ion industry ndustry ss models industry ness models)	o conduct analy management	Number of hours 8 10 8 10 8 10 8 10 8 10 8 10 10 8 10 11 12 4 4 2 4 2 4 2 4 2 4 2 1 Number of hours 30 15 30 10
W-1 Module/C C-1 Course C T-A-1 T-A-2 T-A-3 T-A-4 T-A-5 T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 T-W-7 T-W-6 T-W-7 T-W-6 T-W-7 T-W-8 T-W-9 T-W-10 T-W-10 T-W-10 Student A-A-1 A-A-2 A-W-1 A-W-2 A-W-3	Knowledge of the Course unit objective To be able to diffe forces and busines content divided into Preparation of the Preparation of the Case studies - strat Marketing plan for Completion of the Introduction to the Review of the main Developing new br Corporate diversifier Industry analysis at Strategic and culture Developing and im The role of top ma Supply chain analy Marketing in const Completion of the Workload - forms of Participation in the Own work, self-study self-preparation for	Yes rentiate ss mode variou macro- chosen ategies a selec excerci e course n schoo usiness ication: and new ural cha nplemer nageme ysis. Tec ruction lecture: f activi e classe idy, Prej sses, co	e basic theories fro el conceptions and us forms of instru- environment analy company's strate of selected compa- ted company fron sers :: Competitive adv ls of thought abou models The concept of re business models The concept of re business models nge - the case stu- ting sustainable sent teams chniques for strate industry - interna s ty s paration for comp ompletion of the lectur	to scrutinize select uction ysis of the selected gy nies from construct in the construction in antages and busine it strategy making latedness in the construction idies strategies (and busin egic planning. tional aspects	ed issues of modern top i company ion industry ndustry ss models industry ness models)	o conduct analy management	Number of hours 8 10 8 10 8 10 8 10 8 10 8 10 10 8 10 10 11 2 4 2 4 2 2 4 2 2 4 2 1 1 Number of hours 30 15 30 10

Teaching	method	ls / tools									
M-3	project	based learning method									
Evaluatior	n metho	ods (F - progressive, P - final)									
S-1	F	written test									
5-2	F	project appraisal	oject appraisal								
	Desigr	ned learning outcomes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course	e content	Teaching methods	Evaluation methods	
Knowledg	е		I	I	1	1			I		
	knows an	d understands the basic concepts and a strategic construction company	B-A_2A_W14	P7S_WK_TA21	P75_WK_IA21	C-1	T-W-1 T-W-2 T-W-3 T-W-4 T-W-5	T-W-6 T-W-7 T-W-8 T-W-9 T-W-10	M-1 M-2	S-1	
Skills											
	can apply	methods of analysis of the environment rise resources	B-A_2A_U01	P75_UK		C-1	T-A-1 T-A-2 T-A-3 T-A-4 T-W-1 T-W-2 T-W-3	T-W-4 T-W-5 T-W-6 T-W-7 T-W-8 T-W-9 T-W-10	M-1 M-2 M-3	S-1 S-2	
Other soc	ial / per	sonal competences									
	demonstr	ates creativity in solving strategic ction company	B-A_2A_K05	P7S_KO		C-1	T-A-1 T-A-2	T-A-3 T-A-4	M-1 M-2 M-3	S-1 S-2	
Required	reading										
1. Langford	D. and	Retik A., The Organization and Mana	gement of Constr	uction: Shapi	ng theory and	practic	e, Rout	ledge, 2	002		
		management, planning and control: Elsevier, 2006	managing engin	eering, constr	uction and m	anufact	uring p	rojects t	o PMI, A	APM	

Field of							
	study	Civil E	Engineering				
Mode of	f study	statio	nary	Level	second cycle		
Gradua	te's qualification	magis	ster			WBi/	7
Area(s)	of study	nauki	techniczne			1000	`
Educati	onal profile	gener	al academic				
Module							
Course	unit	BIM i	n Constructio	n Management			
Code		WBIA/	/S2CE/ICM/D/16	5			
Field of	specialisation	Intern	ational Constru	uction Managemer	nt		
	stering faculty	Zespó	ół Dydaktyczny	-	izacji i Zarządzania w		
			wnictwie				
ECTS		3,0		ECTS (forms)	3,0		
	f course credit	credit	S	Language	english		
Elective	25			Elective group			
Form of	finstruction	Code	Semester	Hours	ECTS	Weight	Credit
laborato	ory course	L	3	30	1,5	0,50	credits
lecture		W	3	15	1,5	0,50	credits
Leading	g teacher	Arasz	kiewicz Krystyr	na (Krystyna.Arasz	kiewicz@zut.edu.pl)		·
Other te	eachers				<u>_</u>		
Prerequ	isites						
W-1	none						
Modulo	/course unit objectiv						
			of the Building Inf	formation Modelling	in a context of construction	on project mana	agement and
C-1	information manage					· · ·	
Course	content divided into	variou	s forms of inst				
T-L-1							Number of hours
1-6-1	Introduction to the	Course	. Review of softw	vare tools			Number of hours
T-L-2	Organization of the Supporting the use	e Course e work o e of class	. Review of softw of the project team sification system	vare tools m: preparation of the	BEP, determination of Lo etwork services to share s		
T-L-2	Organization of the Supporting the use needs of a central	e Course e work o e of class data rep	. Review of softw of the project tean sification system pository	vare tools m: preparation of the s. Configuration of n			2
T-L-2 T-L-3	Organization of the Supporting the use needs of a central Technical project of	e Course e work o e of class data rep of a resid	. Review of softw of the project tea sification system pository dential building in	vare tools m: preparation of the s. Configuration of n			2 4 12
T-L-2 T-L-3 T-L-4	Organization of the Supporting the use needs of a central Technical project of Clash detection an Selected analyzes	e Course e work o e of class data rep of a resion d intero	. Review of softw of the project tean sification system pository dential building in perability	vare tools m: preparation of the s. Configuration of n n BIM technology		shares for the	2 4 12 1
T-L-2 T-L-3 T-L-4 T-L-5	Organization of the Supporting the use needs of a central Technical project of Clash detection ar Selected analyzes analysis)	e Course e work o e of class data rep of a resic nd intero of the c	. Review of softw of the project tean sification system pository dential building in perability reated BIM mode	vare tools m: preparation of the s. Configuration of n n BIM technology el (work schedule, bil	etwork services to share s	shares for the	2 4 12 1 6
T-L-2 T-L-3 T-L-4 T-L-5 T-L-6	Organization of the Supporting the use needs of a central Technical project of Clash detection an Selected analyzes analysis) Mobile project ma	e Course e work o e of class data rep of a resic nd intero of the co nagemen	. Review of softw of the project tean sification system pository dential building in perability reated BIM mode	vare tools m: preparation of the s. Configuration of n n BIM technology el (work schedule, bil	etwork services to share s	shares for the	2 4 12 1 6 3
T-L-2 T-L-3 T-L-4 T-L-5 T-L-6 T-L-7	Organization of the Supporting the use needs of a central Technical project of Clash detection an Selected analyzes analysis) Mobile project man Presentations of p	e Course e work o e of class data rep of a resic id intero of the ci nagemen rojects	. Review of softw of the project tean sification system pository dential building in perability reated BIM mode nt on the constru	vare tools m: preparation of the s. Configuration of m n BIM technology el (work schedule, bil action site, exchange	etwork services to share s	shares for the	2 4 12 1 6 3 2
T-L-2 T-L-3 T-L-4 T-L-5 T-L-6	Organization of the Supporting the use needs of a central Technical project of Clash detection an Selected analyzes analysis) Mobile project man Presentations of p Information manage	e Course e work o e of class data rep of a resic nd intero of the co nagement rojects gement i	. Review of softw of the project tean sification system pository dential building in perability reated BIM mode nt on the construction	vare tools m: preparation of the s. Configuration of m n BIM technology el (work schedule, bil action site, exchange on industry	etwork services to share s	shares for the	2 4 12 1 6 3 3 2 2 2
T-L-2 T-L-3 T-L-4 T-L-5 T-L-6 T-L-7 T-W-1	Organization of the Supporting the use needs of a centralTechnical project of Clash detection and Selected analyzes analysis)Mobile project man Presentations of p Information manage Communication and	e Course e work o e of class data rep of a resid ad intero of the co nagement rojects gement in	. Review of softw of the project teal sification system oository dential building in perability reated BIM mode nt on the constru- in the construction work in the cons	vare tools m: preparation of the s. Configuration of m n BIM technology el (work schedule, bil action site, exchange on industry truction project lifect	etwork services to share s	shares for the	2 4 12 1 6 3 2
T-L-2 T-L-3 T-L-4 T-L-5 T-L-6 T-L-7 T-W-1 T-W-2	Organization of the Supporting the use needs of a central Technical project of Clash detection an Selected analyzes analysis) Mobile project man Presentations of p Information manage	e Course e work o e of class data rep of a resic id intero of the co nagemen rojects gement i nd team	. Review of softw of the project tean sification system pository dential building in perability reated BIM mode nt on the construc- in the construction work in the cons ation Modelling a	vare tools m: preparation of the s. Configuration of m n BIM technology el (work schedule, bil action site, exchange on industry truction project lifect	etwork services to share s	shares for the	2 4 12 1 6 3 2 2 2 1
T-L-2 T-L-3 T-L-4 T-L-5 T-L-6 T-L-7 T-W-1 T-W-2 T-W-2 T-W-3	Organization of the Supporting the use needs of a central Technical project of Clash detection an Selected analyzes analysis) Mobile project main Presentations of p Information manage Communication and History of Building	e Course e work o e of class data rep of a resic of a resic of the co nagement rojects gement i nd team linforma t Deliver	. Review of softw of the project tean sification system pository dential building in perability reated BIM mode nt on the constru- in the construction work in the cons ation Modelling a ry concept	vare tools m: preparation of the s. Configuration of m n BIM technology el (work schedule, bil action site, exchange on industry truction project lifect	etwork services to share s	shares for the	2 4 12 1 6 3 2 2 2 1 1 1
T-L-2 T-L-3 T-L-4 T-L-5 T-L-6 T-L-7 T-W-1 T-W-2 T-W-3 T-W-4	Organization of the Supporting the use needs of a central Technical project of Clash detection ar Selected analyzes analysis) Mobile project main Presentations of p Information manage Communication ar History of Building	e Course e work o e of class data rep of a resid ad intero of the co nagement rojects gement i nd team linforma t Deliver	. Review of softw of the project tean sification system pository dential building in perability reated BIM mode nt on the constru- in the construction work in the cons ation Modelling a ry concept ev	vare tools m: preparation of the s. Configuration of m n BIM technology el (work schedule, bil action site, exchange on industry truction project lifect	etwork services to share s	shares for the	2 4 12 1 6 3 2 2 2 1 1 1 1 1
T-L-2 T-L-3 T-L-4 T-L-5 T-L-6 T-L-7 T-W-1 T-W-2 T-W-2 T-W-3 T-W-4 T-W-5	Organization of the Supporting the use needs of a central Technical project of Clash detection and Selected analyzes analysis) Mobile project man Presentations of p Information manage Communication and History of Building Integrated Product BIM Standards - and Standards - Standard	e Course e work o e of class data rep of a resic id intero of the co nagement rojects gement i linforma t Deliver n overwin for comr	. Review of softw of the project tean sification system pository dential building in perability reated BIM mode nt on the construc- in the construction work in the cons ation Modelling a ry concept ev munication	vare tools m: preparation of the s. Configuration of m n BIM technology el (work schedule, bil action site, exchange on industry truction project lifec; and terminology	etwork services to share s	shares for the	2 4 12 1 6 3 2 2 2 1 1 1 1 1 1 1
T-L-2 T-L-3 T-L-4 T-L-5 T-L-6 T-L-7 T-W-1 T-W-1 T-W-2 T-W-3 T-W-3 T-W-5 T-W-6	Organization of the Supporting the use needs of a central Technical project of Clash detection and Selected analyzes analysis) Mobile project man Presentations of p Information manage Communication and History of Building Integrated Product BIM Standards - ard BIM as a platform Fundamental mode An overview of the	e Course e work o e of class data rep of a resid ad intero of the co nagement rojects gement i nd team linforma t Deliver for comr eling teo e most w	. Review of softw of the project tean sification system pository dential building in perability reated BIM mode nt on the construc- in the construction work in the cons ation Modelling a ry concept ev munication chniques used in videly used file pr	vare tools m: preparation of the s. Configuration of m h BIM technology el (work schedule, bil iction site, exchange on industry truction project lifecy ind terminology BIM rotocols (the IFC stan	etwork services to share s	shares for the	2 4 12 1 6 3 2 2 2 2 1 1 1 1 1 1 1 1
T-L-2 T-L-3 T-L-4 T-L-5 T-L-6 T-L-7 T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-6 T-W-7	Organization of the Supporting the use needs of a central Technical project of Clash detection and Selected analyzes analysis) Mobile project main Presentations of p Information manage Communication and History of Building Integrated Product BIM Standards - and BIM as a platform Fundamental mod An overview of the Collaboration, Mode	e Course e work o e of class data rep of a resic id intero of the co nagement rojects gement i nd team linforma t Deliver for comr eling tec e most w del Shari	. Review of softw of the project tean sification system pository dential building in perability reated BIM mode nt on the constru- in the construction work in the cons ation Modelling a y concept ev munication chniques used in ridely used file pr ng and Design M	vare tools m: preparation of the s. Configuration of m h BIM technology el (work schedule, bil iction site, exchange on industry truction project lifec; ind terminology BIM rotocols (the IFC stan anagement	etwork services to share s	shares for the	2 4 12 1 6 3 2 2 2 1 1 1 1 1 1 1 1 1 1
T-L-2 T-L-3 T-L-4 T-L-5 T-L-6 T-L-7 T-W-1 T-W-2 T-W-3 T-W-3 T-W-3 T-W-5 T-W-5 T-W-6 T-W-7 T-W-8	Organization of the Supporting the use needs of a central Technical project of Clash detection and Selected analyzes analysis) Mobile project main Presentations of p Information manage Communication and History of Building Integrated Product BIM Standards - and BIM as a platform Fundamental mod An overview of the Collaboration, Mode	e Course e work o e of class data rep of a resid ad intero of the co nagement rojects gement i nd team linforma t Deliver for comr eling teo e most w del Shari ion Man	. Review of softw of the project tean sification system pository dential building in perability reated BIM mode nt on the construc- in the construction work in the cons ation Modelling a ry concept ev munication chniques used in videly used file pr ng and Design M agement - Coord	vare tools m: preparation of the s. Configuration of m h BIM technology el (work schedule, bil iction site, exchange on industry truction project lifecy ind terminology BIM rotocols (the IFC stan anagement ination and Clash De	etwork services to share s	shares for the	2 4 12 1 6 3 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1
T-L-2 T-L-3 T-L-4 T-L-5 T-L-6 T-L-7 T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-6 T-W-7 T-W-8 T-W-9	Organization of the Supporting the use needs of a central Technical project of Clash detection and Selected analyzes analysis) Mobile project main Presentations of p Information manage Communication and History of Building Integrated Product BIM Standards - and BIM as a platform Fundamental mod An overview of the Collaboration, Moco BIM and Construct	e Course e work o e of class data rep of a resid ad intero of the co nagement rojects gement i nd team linforma t Deliver for comr eling teo e most w del Shari ion Man	. Review of softw of the project tean sification system pository dential building in perability reated BIM mode nt on the construc- in the construction work in the cons ation Modelling a ry concept ev munication chniques used in videly used file pr ng and Design M agement - Coord	vare tools m: preparation of the s. Configuration of m h BIM technology (work schedule, bil iction site, exchange on industry truction project lifecy ind terminology BIM rotocols (the IFC stan anagement ination and Clash De	etwork services to share s	shares for the	2 4 12 1 6 3 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
T-L-2 T-L-3 T-L-4 T-L-5 T-L-6 T-L-7 T-W-1 T-W-2 T-W-3 T-W-3 T-W-3 T-W-5 T-W-5 T-W-6 T-W-7 T-W-8 T-W-9 T-W-10	Organization of the Supporting the use needs of a central Technical project of Clash detection an Selected analyzes analysis) Mobile project main presentations of p Information manage Communication an History of Building Integrated Product BIM Standards - an BIM as a platform Fundamental mod An overview of the Collaboration, Moce BIM and Construct 4-D Sequencing, S	e Course e work o e of class data rep of a resid ad intero of the co nagement rojects gement i noverwid for comr eling teo e most w del Shari ion Mana afety, Lo	. Review of softw of the project tean sification system pository dential building in perability reated BIM mode nt on the constru- in the construction work in the cons ation Modelling a ry concept ev munication chniques used in ridely used file pr ng and Design M agement - Coord ogistics and Com	vare tools m: preparation of the s. Configuration of m h BIM technology (work schedule, bil iction site, exchange on industry truction project lifecy ind terminology BIM rotocols (the IFC stan anagement ination and Clash De	etwork services to share s	shares for the	2 4 12 1 6 3 2 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
T-L-2 T-L-3 T-L-4 T-L-5 T-L-6 T-L-7 T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-6 T-W-5 T-W-6 T-W-7 T-W-8 T-W-9 T-W-9 T-W-10 T-W-11	Organization of the Supporting the use needs of a central Technical project of Clash detection ar Selected analyzes analysis) Mobile project main Presentations of p Information manage Communication ar History of Building Integrated Product BIM Standards - ar BIM as a platform Fundamental mod An overview of the Collaboration, Moor BIM and Construct 4-D Sequencing, S Sustainable BIM	e Course e work o e of class data rep of a resid ad intero of the co nagement rojects gement i nd team linforma t Deliver for comr eling teo e most w del Shari ion Mana afety, Lo	. Review of softw of the project tean sification system pository dential building in perability reated BIM mode nt on the constru- in the construction work in the cons ation Modelling a ry concept ev munication chniques used in ridely used file pr ng and Design M agement - Coord ogistics and Com	vare tools m: preparation of the s. Configuration of m h BIM technology (work schedule, bil iction site, exchange on industry truction project lifecy ind terminology BIM rotocols (the IFC stan anagement ination and Clash De	etwork services to share s	shares for the	2 4 12 1 6 3 2 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
T-L-2 T-L-3 T-L-4 T-L-5 T-L-6 T-L-7 T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-5 T-W-6 T-W-5 T-W-6 T-W-7 T-W-8 T-W-9 T-W-10 T-W-10 T-W-11 T-W-12 T-W-13	Organization of the Supporting the use needs of a central Technical project of Clash detection and Selected analyzes analysis) Mobile project main Presentations of p Information manage Communication and History of Building Integrated Product BIM Standards - and BIM as a platform Fundamental mod An overview of the Collaboration, Moor BIM and Construct 4-D Sequencing, S Sustainable BIM BIM and Facility M	e Course e work o e of class data rep of a resid ad intero of the co nagement rojects gement i no team linforma t Deliver n overwie for comr eling teo e most w lel Shari ion Mana afety, Lo anagement	. Review of softw of the project teal sification system pository dential building in perability reated BIM mode nt on the constru- in the construction work in the construction work in the construction ation Modelling a ry concept ev munication chniques used in videly used file pr ng and Design M agement - Coord ogistics and Com ent - basics	vare tools m: preparation of the s. Configuration of m h BIM technology (work schedule, bil iction site, exchange on industry truction project lifecy ind terminology BIM rotocols (the IFC stan anagement ination and Clash De	etwork services to share s	shares for the	2 4 12 1 6 3 2 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
T-L-2 T-L-3 T-L-4 T-L-5 T-L-6 T-L-7 T-W-1 T-W-2 T-W-3 T-W-3 T-W-4 T-W-5 T-W-5 T-W-6 T-W-5 T-W-6 T-W-7 T-W-8 T-W-9 T-W-10 T-W-10 T-W-11 T-W-12 T-W-13	Organization of the Supporting the use needs of a central Technical project of Clash detection ar Selected analyzes analysis) Mobile project main Presentations of p Information manage Communication ar History of Building Integrated Product BIM Standards - ar BIM as a platform Fundamental mod An overview of the Collaboration, Moor BIM and Construct 4-D Sequencing, S Sustainable BIM BIM and Facility M completion of lect	e Course e work o e of class data rep of a resic data rep of a resic di intero of the co nagement ind team linforma t Deliver n overwid for comr eling teo e most w del Shari ion Mana afety, Lo anagement data data data data for comr eling teo e most w del Shari ion Mana afety, Lo anagement data data data data data data data dat	. Review of softw of the project tean sification system pository dential building in perability reated BIM mode nt on the constru- in the construction work in the cons ation Modelling a ry concept ev munication chniques used in ridely used file pr ng and Design M agement - Coord pojistics and Com ent - basics	vare tools m: preparation of the s. Configuration of m h BIM technology (work schedule, bil iction site, exchange on industry truction project lifecy ind terminology BIM rotocols (the IFC stan anagement ination and Clash De	etwork services to share s	shares for the	2 4 12 1 6 3 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

Student	workload	l - forms of activity						Num	nber of	hours
A-L-3	Compl	etion the subject								3
A-W-1	presen	ce on lectures								14
A-W-2	self-stı	ıdy								30
A-W-3	comple	etion of lectures								1
Teaching	n method	ls / tools								
M-1	lecture	S								
M-2	case st	udies								
М-З	project	method								
Evaluatio	on metho	ods (F - progressive, P - final)								
S-1	Р	final test								
S - 2	Р	project evaluation								
	Desigr	ned learning outcomes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Cours	e content	Teaching methods	Evaluatior methods
Knowled	ge		1	•			4			
systems an appropriate	t knows the d IT tools for IT solution ature of the	e basic models of group work in BIM or their implementation. He can choose is depending on the adopted assumptions work, the size of the group, the	B-A_2A_W09 B-A_2A_W13	P7S_WG_TA21	P7S_WG_IA21	C-1	T-W-1 T-W-2 T-W-3 T-W-4 T-W-5 T-W-6	T-W-7 T-W-8 T-W-9 T-W-10 T-W-11 T-W-12	M-1 M-2	S-1
Skills										
system of n rights of gro solutions of	ose and co nanaging t oups of use various Bl and implen	nfigure IT resources, he can run the ne flow of documentation, determine the rs and individual users, he can integrate M software producers. Is able to nent the rules of work safety in the BIM	B-A_2A_U07	P7S_UW_TA22	P7S_UW_IA22	C-1	T-L-1 T-L-2 T-L-3 T-L-4 T-L-5 T-L-6 T-W-1 T-W-2 T-W-3	T-W-4 T-W-5 T-W-6 T-W-7 T-W-8 T-W-9 T-W-10 T-W-10 T-W-11 T-W-12	M-1 M-2 M-3	S-1 S-2
Other so	cial / per	sonal competences								
work. can p	t has a dee ropose and	p awareness of the importance of group I implement in the team BIM server d technologies and other solutions for	B-A_2A_K02 B-A_2A_K05	P7S_KK P7S_KO		C-1	T-L-2 T-W-1 T-W-2 T-W-4 T-W-5	T-W-6 T-W-7 T-W-8 T-W-9 T-W-10	M-1 M-2 M-3	S-1 S-2
Requirea	l reading									
1. Barnes,	, P., Davie	es, N.,, BIM in Principle and in Practice	(2nd Edition), I	CE Publishing,	2015					
2. Eastma Wiley & Se		cholz, P., Sacks, R. and Liston,K., BIM 2011	Handbook, a Gu	ide to Building	Information	Modellir	ng 2nd	Ed., Hob	oken: J	ohn
Supplem	entary r	eading								
	-	ve McCool, BIM and Construction Man	agement: Prover	n Tools Metho	ds and Work	flows In	hn Wil	ev & Sor	us 201 ¹	5

				-		-		
Field of s	tudy	C	Civil E	Engineering				
Mode of s	study	s	tatio	nary	Level	second cycle		
Graduate	e's qualif	<i>ication</i> n	nagis	ster			WBi/	1
Area(s) o			nauki	techniczne			VVDI/	٦.
Education	-			al academic				
Module		9	Jerrer				-	
Course u	nit		ntor	national Const	ruction Semina	r	-	
Code	1110		_		indetion Semina		- 1	
	nocialia			/S2CE/ICM/D/17	ation Managanaa	L	- (
Field of s	-				ction Managemen	t	- \	
Administ	ering fac	-		lra Geotechniki				
ECTS			2,0		ECTS (forms)	2,0	_	
Form of c	course c	redit c	redit	S	Language	english		
Electives					Elective group			
Form of i	instructio	on C	Code	Semester	Hours	ECTS	Weight	Credit
seminars	5		S	3	15	1,0	0,50	credits
lecture			W	3	15	1,0	0,50	credits
Leading t	teacher	P	ozlev	wicz Andrzei (Ar	drzej.Pozlewicz@	zut.edu.pl)	-	
Other tea		V	/isitir	-	iting@zut.edu.pl)	, Wróblewski Tomasz		
Prerequis	sites			`				
W-1		nowlegde of c	ivil er	ngineering module	es from 1st and 2nd	semester		
Module/c	ourse ui	nit objectives						
C-1	To wid			main aspects con	cerning manageme	nt of international proje	cts and internation	onal members of
Course co	ontent d	ivided into va	ariou	s forms of instru	ıction			Number of hours
T-S-1	Panel o		selec	ted case studies i		g, economic, technolog	ical,	15
T-W-1	techno Nether - techn affectir rainbo techno interna	logical, enviro lands, 'keep fo ologies, enviro ng internationa wing technolog logy in civil en itionally. Cultu	nmen pot dry onmei al proj gy, su nginee iral dif	Ital, sociological a y' concept, inland ntal problems. Hig jects. Financing in stainable develop ering and built env fferences while ru	nd economical aspe waters flood proble in rise buildings, geo ternational projects ment in internationa vironment by means	. Three Gorges Dam pro cts. Flood protection pr ms. Undersea tunnels in otechnical aspects, seis . Hoover Dam case stud al projects. Transfer of r of construction compa foreign country, team v problems.	ojects in the n Korea, Europe mic activity dy. Palm islands, nodern nies operating	15
Student v	workload	l - forms of a	ctivit	<i>y</i>				Number of hours
A-S-1	Attend	ance on semin	nar					15
A-S-2	Desk s	tudy on chosei	n cas					5
A-S-3	Consul	tancies						2
A-S-4	Review	of case studie	es, co	nclusions on chos	en aspects, written	report		7
A-S-5		etion of semina						2
A-W-1		ance on lectur						15
A-W-2				ernational project				12
A-W-3			ent ow	n point of view fro	om presented and d	iscussed case studies		2
A-W-4	Final a	ssessment						1
Teaching	method	ls / tools						
М-1	Interac	tive lecture						
М-2	semina							
М-3	case st	udies method						
Evaluatio	n moth	de (E - progr	rocciv					
			E331V	ve, P - final)				
S-1 S-2	F P	: -		ve, P - final) sses and seminar				

Designed learning outcomes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Cours	e content	Teaching methods	Evaluation methods
Knowledge								
B-A_2A_ICM/D/14_W01 Student is able to identify main issues relevant to management of international projects and to staff memebers of a construction company from different countries. Student may recognise the world wide leading construction project with a context of economical, technological, environmental, social aspects.	B-A_2A_W12 B-A_2A_W14	P7S_WG_TA21 P7S_WK_TA21		C-1	T-S-1	T-W-1	M-1 M-2 M-3	S-1 S-2
Skills								
B-A_2A_ICM/D/14_U01 Student is able to assess international construction project from technological, environmental, social perspective. Student is able to point main achievements in civil engineering from discussed case studies.	B-A_2A_U11 B-A_2A_U13	P7S_UK P7S_UO P7S_UW_TA22 P7S_UW_TA23		C-1	T-S-1	T-W-1	M-1 M-2 M-3	S-1 S-2
Other social / personal competences								
B-A_2A_ICM/D/14_K01 Student is aware of selected technical and non-technical aspects appearing in international project management upon discussed case studies. Student gains competencies allowing to point main cultural, ethic, social issues connected to work in international project.	B-A_2A_K03	P7S_KK P7S_KR		C-1	T-S-1	T-W-1	M-1 M-2 M-3	S-2
Required reading								
1. Knovel Data Base - Civil Engineering and Construction	Management							

Field of stu												
Made	udy	Civil E	ngineering]					
Mode of st	tudy	statior	nary	Level	second	cycle	1					
-			magister					WBiA				
Area(s) of	study	nauki	nauki techniczne									
Education	al profile	genera	al academic				1 [
Module	-							- 11				
Course un	it	Resea	rch Skills					- 11				
Code		WBIA/	WBIA/S2CE/ICM/D/18					- 11		II N		
Field of specialisation		_	International Construction Management					- 11				
Administering faculty		-	Katedra Geotechniki					\square	ш			
ECTS		1,0		ECTS (forms)	1,0		-					
Form of course credit		-	<u>.</u>	Language		english						
Electives		credits		Elective group	-							
										<u> </u>		
Form of in	struction	Code	Semester	Hours		ECTS		hight		Credit		
lecture		W	3	15		1,0	1,	.00	C	redit	5	
Leading te	eacher		vicz Andrzej (An	-								
Other teachers		Visitin (Toma	Visiting Professor (Visiting@zut.edu.pl), Wróblewski Tomasz (Tomasz.Wroblewski@zut.edu.pl), Żarkiewicz Krzysztof (Krzysztof.Zarkiewicz@							.edu.	pl)	
Prerequisi	tes											
W-1	1st cycle degree in	n civil en	gineering									
Module/co	urse unit objectiv	'es										
C-1	to provide each st and studied specia		h an opportunity	to carry out inde	ependent rese	earch on giver	topic re	elevant to	o civil e	ngine	ering	
Course co	ntent divided into	various	forms of instru	ıction					Numb	er of	hours	
T-W-1	Purpose and method in a scientific study; the logic of scientific research and the choice of method. Theory and method; design and the research process. The deductive process and the research method. Case studies and complex strategies as a method. Research method and reliability of research results in the context of applicability; result application as the final verification of the correctness of the test; test verification methods.							od.	15			
Student w	orkload - forms o								Numb	er of	hours	
A-W-1	Attendance on lec								15			
A-W-2	Self study on meth	ettures ethods used in scientific work						6				
A-W-3	Personal study on methods of data analysis and testing hypothesis							6				
A-W-4	Consultancies and	complet	completion of the subject						3			
Teaching i	methods / tools											
-	lecture and discus	sion										
M-1												
	n methods (F - pro	aressiv	e, P - final)									
	P progress re	-	e, P - final)									
Evaluation		eport		Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course co		eaching methods		
Evaluation S-1	P progress re Designed learnin	eport		learning outcomes designed for the fields of	learning outcomes defined for the particular areas of	learning outcomes leading to the		Course co				
Evaluation S-1 Knowledge B-A_2A_ICM/C	P progress re Designed learnir	ig outco	mes	learning outcomes designed for the fields of	learning outcomes defined for the particular areas of	learning outcomes leading to the degree of "inżynier" P7S_WG_IA21		Course co T-W-1				
Evaluation S-1 Knowledge B-A_2A_ICM/E Student unde	P progress re Designed learnin e	ig outco	mes	B-A_2A_W02 B-A_2A_W05 B-A_2A_W05 B-A_2A_W06 B-A_2A_W14	learning outcomes defined for the particular areas of education P7S_WG_TA21	learning outcomes leading to the degree of "inżynier" P7S_WG_IA21	objectives			nethods	methods	
Evaluation S-1 Knowledge B-A_2A_ICM/E Student unde methods Skills B-A_2A_ICM/C Student unde the method a	P progress re Designed learnin e D/15_W01 stands standards of so	cientific re	mes search and lationship between	B-A_2A_W02 B-A_2A_W05 B-A_2A_W05 B-A_2A_W06 B-A_2A_W14	learning outcomes defined for the particular areas of education P7S_WG_TA21	learning outcomes leading to the degree of "inżynier" P7S_WG_IA21	c-1			nethods	Evaluation methods S-1 S-1	

B-A_2A_ICM/D/15_K01 Student understands the social significance of scientific research and is aware of the need for their applicability	B-A_2A_K01 B-A_2A_K02 B-A_2A_K04 B-A_2A_K05 B-A_2A_K05 B-A_2A_K07	P75_KK P75_KO P75_KR	C-1	T-W-1	M-1	S-1		
Required reading								
1. Gaugh, H. G.,, Scientific Method in Practice, Cambridge University Press, Cambridge, 2003								
2. Douglas C. Montgomery, Design and Analysis of Experiments, John Wiley & Sons, Inc., 2013, 8th Edition								
Supplementary reading					<u>_</u>	<u>_</u>		
1. M. Raman, S. Sharma, Technical Communicatio. Principles and Practice, Oxford University Press, Oxford, 2015, 3rd Edition								