Computer Methods in Bridge Engineering			STUDY MODULE D	ESCRIPTION FORM					
Profice of study   Profice of		•							
Civil Engineering Second-cycle Studies   (general academic, practical) (brak)   1/2		-	n Bridge Engineering						
Elective path/specialty Bridges and Underground Engineering Cycle of study: Second-cycle studies Second-cycle stud	·			(general academic, practical)					
Second-cycle studies			cond-cycle Studies	· '					
Second-cycle studies    Form of study (full-time,part-time)	Elective		Underground Engineering						
No. of hours Lecture: 1 Classes: - Laboratory: 2 Project/seminars: - 2  Status of the course in the study program (Basic, major, other) (brak)  Education areas and fields of science and art technical sciences Technical sciences Technical sciences  Technical sciences	Cycle o		gg	,					
No. of hours Lecture: 1 Classes: - Laboratory: 2 Project/seminars: - 2  Status of the course in the study program (Basic, major, other) (brak)  Education areas and fields of science and art technical sciences Technical sciences Technical sciences  Technical sciences		Second-c	vola studias	full-t	full time				
Lecture: 1 Classes: - Laboratory: 2 Project/seminars: - 2  Status of the course in the study program (Basic, major, other) (brak) (brak)  Education areas and fields of science and at technical sciences  Tec			yolo studios	Tull-t					
Status of the course in the study program (Basic, major, other) (brak)  Education areas and fields of science and art  technical sciences Technical sciences Technical sciences Technical sciences  Technical sciences Technical sciences  Technical science  Technical sciences  Technical sc		4		<b>D</b> : // : .	_				
Education areas and fields of science and art  technical sciences Tech		Olabbo	c. <u>Laboratory</u> .						
Education areas and fields of science and art  technical sciences	Status	-		•					
Technical sciences  Responsible for subject / lecturer:  Wojciech Siekierski email: Wojciech Siekierski@put.poznan.pl tel. 6475834 Budownictwa i Inżynierii Środowiska ul. Piotrowo 5  Prerequisites in terms of knowledge, skills and social competencies:  Knowledge  Strength of materials, structural mechanics, concrete bridges, steel bridges  Skills  Basics of structural design, conceptual design of concrete and steel bridges  Skills  Responsilbilty  competencies  Acquiring knowledge on computer aided bridge design  Study outcomes and reference to the educational results for a field of study  Knowledge:  1. Theoretical basics of computer aided anlysis of bridges - [K_W14, KW16] 2. Computational models of bridge spans and supports - [K_W14, KW16] 3. Method of verification computer analysis results - [K_W14, KW16] 3. Method of verification computer analysis results - [K_W14, KW16]  Skills:  1. Creation of computational model of bridge - [K_U03, K_U04] 2. Regarding erection methods in computational model - [K_U03, K_U04] 3. Computer analysis on bridge structure - [K_U03, K_U04] 5. Computer analysis on bridge structure - [K_U03, K_U04] 5. Computer analysis on bridge structure - [K_U03, K_U04] 5. Computer analysis on bridge structure - [K_U03, K_U04] 5. Computer analysis on bridge structure - [K_U03, K_U04] 5. Computer analysis on bridge structure - [K_U03, K_U04] 5. Self-reliance - [K_K01]	Educati		1 /		ECTS distribution (number				
Responsible for subject / lecturer:  Wojciech Siekierski email: Wojciech Siekierski@put.poznan.pl tel. 6475834 Budownictwa i Inżynierii Środowiska ul. Piotrowo 5  Prerequisites in terms of knowledge, skills and social competencies:  1 Knowledge Strength of materials, structural mechanics, concrete bridges, steel bridges  2 Skills Basics of structural design, conceptual design of concrete and steel bridges  3 Social Responsiibility competencies  Assumptions and objectives of the course: Acquiring knowledge on computer aided bridge design  Study outcomes and reference to the educational results for a field of study  Knowledge:  1. Theoretical basics of computer aided anlysis of bridges - [K_W14, KW16] 2. Computational models of bridge spans and supports - [K_W14, KW16] 3. Method of verification computer analysis results - [K_W14, KW16]  Skills:  1. Creation of computational model of bridge - [K_U03, K_U04] 2. Regarding erection methods in computational model - [K_U03, K_U04] 3. Computer analysis on bridge structure - [K_U03, K_U04] 5. Computer analysis on bridge structure - [K_U03, K_U04] 5. Computer analysis on bridge structure - [K_U03, K_U04] 5. Computer analysis on bridge structure - [K_U03, K_U04] 5. Computer analysis on bridge structure - [K_U03, K_U04] 5. Computer analysis on bridge structure - [K_U03, K_U04] 5. Computer analysis on bridge structure - [K_U03, K_U04] 5. Self-reliance - [K_K01]	techr	nical sciences			2 100%				
Wojciech Siekierski email: Wojciech.Siekierski@put.poznan.pl tel. 6475834 Budownictwa i Inżynierii Środowiska ul. Piotrowo 5  Prerequisites in terms of knowledge, skills and social competencies:  1 Knowledge Strength of materials, structural mechanics, concrete bridges, steel bridges  2 Skills Basics of structural design, conceptual design of concrete and steel bridges  3 Social Responsiibilty competencies  Assumptions and objectives of the course: Acquiring knowledge on computer aided bridge design  Study outcomes and reference to the educational results for a field of study  Knowledge:  1. Theoretical basics of computer aided anlysis of bridges - [K_W14, KW16] 2. Computational models of bridge spans and supports - [K_W14, KW16] 3. Method of verification computer analysis results - [K_W14, KW16]  Skills:  1. Creation of computational model of bridge - [K_U03, K_U04] 2. Regarding erection methods in computational model - [K_U03, K_U04] 3. Computer analysis on bridge structure - [K_U03, K_U04]  Social competencies:  1. Self-reliance - [K_K01]		Technical scie	ences		2 100%				
Wojciech Siekierski email: Wojciech.Siekierski@put.poznan.pl tel. 6475834 Budownictwa i Inżynierii Środowiska ul. Piotrowo 5  Prerequisites in terms of knowledge, skills and social competencies:  1 Knowledge Strength of materials, structural mechanics, concrete bridges, steel bridges  2 Skills Basics of structural design, conceptual design of concrete and steel bridges  3 Social Responsiibilty competencies  Assumptions and objectives of the course: Acquiring knowledge on computer aided bridge design  Study outcomes and reference to the educational results for a field of study  Knowledge:  1. Theoretical basics of computer aided anlysis of bridges - [K_W14, KW16] 2. Computational models of bridge spans and supports - [K_W14, KW16] 3. Method of verification computer analysis results - [K_W14, KW16]  Skills:  1. Creation of computational model of bridge - [K_U03, K_U04] 2. Regarding erection methods in computational model - [K_U03, K_U04] 3. Computer analysis on bridge structure - [K_U03, K_U04]  Social competencies:  1. Self-reliance - [K_K01]									
Basics of structural design, conceptual design of concrete and steel bridges  Skills  Responsibility  Responsibility  Assumptions and objectives of the course:  Acquiring knowledge on computer aided bridge design  Study outcomes and reference to the educational results for a field of study  Knowledge:  1. Theoretical basics of computer aided anlysis of bridges - [K_W14, KW16] 2. Computational models of bridge spans and supports - [K_W14, KW16] 3. Method of verification computer analysis results - [K_W14, KW16]  Skills:  1. Creation of computational model of bridge - [K_U03, K_U04] 2. Regarding erection methods in computational model - [K_U03, K_U04] 3. Compuer analysis on bridge structure - [K_U03, K_U04]  Social competencies:  1. Self-reliance - [K_K01]	Woj ema tel. Bud ul. F	iciech Siekierski ail: Wojciech.Siekiersk 6475834 Iownictwa i Inżynierii Ś Piotrowo 5 equisites in term	si@put.poznan.pl Srodowiska ns of knowledge, skills and	<del>-</del>	teel bridges				
Assumptions and objectives of the course:  Acquiring knowledge on computer aided bridge design  Study outcomes and reference to the educational results for a field of study  Knowledge:  1. Theoretical basics of computer aided anlysis of bridges - [K_W14, KW16] 2. Computational models of bridge spans and supports - [K_W14, KW16] 3. Method of verification computer analysis results - [K_W14, KW16]  Skills:  1. Creation of computational model of bridge - [K_U03, K_U04] 2. Regarding erection methods in computational model - [K_U03, K_U04] 3. Computer analysis on bridge structure - [K_U03, K_U04]  Social competencies:  1. Self-reliance - [K_K01]		_	Basics of structural design, conceptual design of concrete and steel bridges						
Assumptions and objectives of the course:  Acquiring knowledge on computer aided bridge design  Study outcomes and reference to the educational results for a field of study  Knowledge:  1. Theoretical basics of computer aided anlysis of bridges - [K_W14, KW16] 2. Computational models of bridge spans and supports - [K_W14, KW16] 3. Method of verification computer analysis results - [K_W14, KW16]  Skills:  1. Creation of computational model of bridge - [K_U03, K_U04] 2. Regarding erection methods in computational model - [K_U03, K_U04] 3. Computer analysis on bridge structure - [K_U03, K_U04]  Social competencies:  1. Self-reliance - [K_K01]			Responsilbilty						
Study outcomes and reference to the educational results for a field of study  Knowledge:  1. Theoretical basics of computer aided anlysis of bridges - [K_W14, KW16]  2. Computational models of bridge spans and supports - [K_W14, KW16]  3. Method of verification computer analysis results - [K_W14, KW16]  Skills:  1. Creation of computational model of bridge - [K_U03, K_U04]  2. Regarding erection methods in computational model - [K_U03, K_U04]  3. Compuer analysis on bridge structure - [K_U03, K_U04]  Social competencies:  1. Self-reliance - [K_K01]		competencies							
Knowledge:  1. Theoretical basics of computer aided anlysis of bridges - [K_W14, KW16]  2. Computational models of bridge spans and supports - [K_W14, KW16]  3. Method of verification computer analysis results - [K_W14, KW16]  Skills:  1. Creation of computational model of bridge - [K_U03, K_U04]  2. Regarding erection methods in computational model - [K_U03, K_U04]  3. Compuer analysis on bridge structure - [K_U03, K_U04]  Social competencies:  1. Self-reliance - [K_K01]									
1. Theoretical basics of computer aided anlysis of bridges - [K_W14, KW16]  2. Computational models of bridge spans and supports - [K_W14, KW16]  3. Method of verification computer analysis results - [K_W14, KW16]  Skills:  1. Creation of computational model of bridge - [K_U03, K_U04]  2. Regarding erection methods in computational model - [K_U03, K_U04]  3. Compuer analysis on bridge structure - [K_U03, K_U04]  Social competencies:  1. Self-reliance - [K_K01]		Study outco	mes and reference to the	educational results for	a field of study				
2. Computational models of bridge spans and supports - [K_W14, KW16]  3. Method of verification computer analysis results - [K_W14, KW16]  Skills:  1. Creation of computational model of bridge - [K_U03, K_U04]  2. Regarding erection methods in computational model - [K_U03, K_U04]  3. Computer analysis on bridge structure - [K_U03, K_U04]  Social competencies:  1. Self-reliance - [K_K01]	Knov	vledge:							
3. Method of verification computer analysis results - [K_W14, KW16]  Skills:  1. Creation of computational model of bridge - [K_U03, K_U04]  2. Regarding erection methods in computational model - [K_U03, K_U04]  3. Compuer analysis on bridge structure - [K_U03, K_U04]  Social competencies:  1. Self-reliance - [K_K01]			•						
Skills:  1. Creation of computational model of bridge - [K_U03, K_U04]  2. Regarding erection methods in computational model - [K_U03, K_U04]  3. Computer analysis on bridge structure - [K_U03, K_U04]  Social competencies:  1. Self-reliance - [K_K01]									
1. Creation of computational model of bridge - [K_U03, K_U04]  2. Regarding erection methods in computational model - [K_U03, K_U04]  3. Computer analysis on bridge structure - [K_U03, K_U04]  Social competencies:  1. Self-reliance - [K_K01]			nputer analysis results - [K_W14, F	(W16]					
2. Regarding erection methods in compuational model - [K_U03, K_U04] 3. Compuer analysis on bridge structure - [K_U03, K_U04]  Social competencies:  1. Self-reliance - [K_K01]			mandal of bridge - EK 1100 1K 110	11					
3. Compuer analysis on bridge structure - [K_U03, K_U04]  Social competencies:  1. Self-reliance - [K_K01]									
Social competencies:  1. Self-reliance - [K_K01]	_								
1. Self-reliance - [K_K01]									
		•							

Assessment methods of study outcomes
Written test
Discussion on complete design excercises

## **Course description**

Idea if finite element method

Computational models of bridge spans and supports

## **Basic bibliography:**

- 1. Madaj A., Wołowicki W.: Podsatwy projektowania budowli mostowych, WKŁ, 2007
- 2. Kmita J., Bień J., Machelski C.: Komputerowe wspomaganie projektowania mostów, WKiŁ, 1989

## Additional bibliography:

## Result of average student's workload

Activity	Time (working hours)					
Student's workload						
Source of workload	houre	ECTS				

Source of workload	hours	ECTS
Total workload	60	2
Contact hours	45	1
Practical activities	30	1