

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Technology of Bridge Construction		Code 1010125141010121017
Field of study Transportation Engineering Extramural Second-	Profile of study (general academic, practical) (brak)	Year /Semester 2 / 4
Elective path/specialty Road Engineering	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: Second-cycle studies	Form of study (full-time, part-time) part-time	
No. of hours Lecture: 15 Classes: - Laboratory: - Project/seminars: 15		No. of credits 2
Status of the course in the study program (Basic, major, other) (brak)		(university-wide, from another field) (brak)
Education areas and fields of science and art technical sciences Technical sciences		ECTS distribution (number and %) 2 100% 2 100%
Responsible for subject / lecturer: dr inż. Krzysztof Sturzbecher email: krzysztof.sturzbecher@put.poznan.pl tel. 616475829 Wydział Budownictwa i Inżynierii Środowiska ul. Piotrowo 5 60-965 Poznań		Responsible for subject / lecturer: dr inż. Krzysztof Sturzbecher email: krzysztof.sturzbecher@put.poznan.pl tel. 616475829 Wydział Budownictwa i Inżynierii Środowiska ul. Piotrowo 5 60-965 Poznań
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Construction of bridge abutments, bridge superstructures of concrete and steel Static work of bridge structures, distributions of internal forces, materials for construction of bridges
2	Skills	Supports the initial design and construction of concrete bridge superstructures and steel
3	Social competencies	Awareness of the need to acquire and extend knowledge
Assumptions and objectives of the course: - Knowledge of construction methods bridges and scaffolding and formwork - Understanding the basics of scaffolding projektowania - Mastering the practical skills to prepare concrete plan and its implementation - The impact of construction technology on design requirements abutments, - Installation of equipment - Construction of bridges while maintaining traffic		
Study outcomes and reference to the educational results for a field of study		
Knowledge: 1. Erections methods of bridge construction - [-] 2. Construction equipment elements of bridges - [-] 3. Erections of concrete bridges - [-] 4. Basic principles of structural analysis of scaffolding - [-] 5. Technological requirements for the construction of abutments - [-]		
Skills:		

1. choose the method of installation or construction of the proposed bridge - [-] 2. pre-design stage and formwork for the concrete bridge - [-] 3. Perform a concreting plan - [-] 4. design a scaffold for the assembly of the multi span steel bridge - [-] 5. design formwork for bridge concrete deck - [-] 6. knowledge of bridge equipment - [-]
Social competencies: 1. Student understands the need for continuous improvement of knowledge on the subject - [-] 2. Student understands the significance and importance of technology in the construction of the final technical effect and scheduled appointments - [-] 3. Student understands the dangers arising from poor construction formwork and scaffolding - [-]

Assessment methods of study outcomes
The written examination consisting of draw and discuss the tasks of construction methods, construction scaffolding and formwork Design exercises together with gauges on the individual steps performed exercises

Course description
Necessary technical documentation to carry out the works construction of concrete bridges with a discussion of the Help Us methods: on the scaffolding of fixed, sliding or pivot on the ground, sliding on the basis of support construction of concrete bridge spans using a cantilever assembly, concrete cantilever construction method of moving the cross construction of road to rail or road construction bridge spans with precast staking out an object on the ground, trenches and their protection and drainage, installation of the reinforcement and prestressing tendons, preparation of concrete, concrete technology and compaction of concrete, building support with the design of scaffolding and formwork, cap construction paving, installation of drainage, waterproofing and paving exercise installation of curbs, barriers and railings construction of abutments, drainage and backfilling abutments installation of bearings and expansion joints, installation of curbs, barriers and railings, construction of abutments, drainage and backfilling abutments installation of bearings and expansion joints, construction scaffolding and formwork for stationary superstructure concrete bridge methods of construction steel bridges (assembly) using cranes road and rail, the method of fitting the area and with the help of temporary supports and barges. supports construction scaffolding, steel structure bridge zerspolonego wieloprzęsłowego, bridge formwork panels, Erection of cable-stayed bridge and hanging bridges

Basic bibliography: 1. D. J. Hartfiel, Elementary Linear Algebra, PWS Publishers (a division of Wadsworth) Inc., Boston 1987. 2. M. Itskov, Tensor Algebra and Tensor Analysis for Engineers with Applications to Continuum Mechanics, Springer-Verlag, Berlin Heidelberg New York, 2007. 3. G. E. Mase, Theory and Problems of Continuum Mechanics, McGraw-Hill Company Inc., 1970. 4. G. T. Mase and G. E. Mase, Continuum Mechanics for Engineers, CRC Press LLC, London New York Washington 1999. 5. Tyn Myint-U, Partial Differential Equations of Mathematical Physics, American Elsevier Publishing Co., Inc., 1973. 6. H. F. Wienberger, A First Course in Partial Differential Equations, John Wiley & Sons Inc., 1965. 7. R. Weinstock, Calculus of Variations, McGraw-Hill Book Company Inc., 1952. 8. T. Trajdos, Matematyka dla inżynierów, Wydawnictwo Naukowo-Techniczne, Warszawa, 1974 9. I. M. Gelfand i S. W. Fomin, Rachunek wariacyjny, Państwowe Wydawnictwo Naukowe, Warszawa, 1972 10. R. Leitner i J. Zacharski, Zarys matematyki wyższej, Wydawnictwo Naukowo-Techniczne, Warszawa, 1998 11. W. Kryszicki i L. Włodarski, Analiza matematyczna w zadaniach, Państwowe Wydawnictwo Naukowe, Warszawa, 1974 12. T. Jurlewicz, Z. Skoczylas, Algebra liniowa 1 Definicje, twierdzenia, wzory, Oficyna Wydawnicza GiS, Wrocław, 2003 13. T. Jurlewicz, Z. Skoczylas, Algebra liniowa 2 Definicje, twierdzenia, wzory, Oficyna Wydawnicza GiS, Wrocław, 2005 14. T. Jurlewicz, Z. Skoczylas, Algebra liniowa 1 Przykłady i zadania, Oficyna Wydawnicza GiS, Wrocław, 2003 15. T. Jurlewicz, Z. Skoczylas, Algebra liniowa 2 Przykłady i zadania, Oficyna Wydawnicza GiS, Wrocław, 2005

Additional bibliography:		
1. D. L. Powers, Elementary Differential Equations with Boundary Value Problems, PWS Publishers (a division of Wadsworth) Inc., Boston 1985.		
2. E. W. Swokowski, Calculus with analytic geometry, PWS Publishers (a division of Wadsworth) Inc., Boston 1983.		
Result of average student's workload		
Activity	Time (working hours)	
1. Participation in lectures	15	
2. Participation in exercise	15	
3. Homework design exercise	45	
4. Preparing for exam	20	
Student's workload		
Source of workload	hours	ECTS
Total workload	95	2
Contact hours	30	1
Practical activities	10	1