

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Technology of Bridge Works</b>		Code <b>1010102121010120222</b>
Field of study <b>Civil Engineering Second-cycle Studies</b>	Profile of study (general academic, practical) <b>general academic</b>	Year /Semester <b>1 / 2</b>
Elective path/specialty <b>Bridges and Underground Engineering</b>	Subject offered in: <b>Polish</b>	Course (compulsory, elective) <b>obligatory</b>
Cycle of study: <b>Second-cycle studies</b>	Form of study (full-time, part-time) <b>full-time</b>	
No. of hours Lecture: <b>30</b> Classes: <b>15</b> Laboratory: <b>30</b> Project/seminars: <b>-</b>		No. of credits <b>6</b>
Status of the course in the study program (Basic, major, other) <b>other</b>		(university-wide, from another field) <b>university-wide</b>
Education areas and fields of science and art		ECTS distribution (number and %)
<b>Responsible for subject / lecturer:</b> dr inż. Krzysztof Sturzbecher email: krzysztof.sturzbecher@put.poznan.pl tel. 616475829 Wydział Budownictwa i Inżynierii Środowiska ul. Piotrowo 5 60-965 Poznań		<b>Responsible for subject / lecturer:</b> dr inż. Krzysztof Sturzbecher email: krzysztof.sturzbecher@put.poznan.pl tel. 616475829 Wydział Budownictwa i Inżynierii Środowiska ul. Piotrowo 5 60-965 Poznań
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	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	<b>Skills</b>	Supports the initial design and construction of concrete bridge superstructures and steel
3	<b>Social competencies</b>	Awareness of the need to acquire and extend knowledge
<b>Assumptions and objectives of the course:</b>		
<ul style="list-style-type: none"> <li>- Knowledge of construction methods bridges and scaffolding and formwork</li> <li>- Understanding the basics of scaffolding projektowania</li> <li>- Mastering the practical skills to prepare concrete plan and its implementation</li> <li>- The impact of construction technology on design requirements abutments,</li> <li>- Installation of equipment</li> <li>- Construction of bridges while maintaining traffic</li> </ul>		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
<ol style="list-style-type: none"> <li>1. Erections methods of bridge construction - [-]</li> <li>2. Construction equipment elements of bridges - [-]</li> <li>3. Erections of concrete bridges - [-]</li> <li>4. Basic principles of structural analysis of scaffolding - [-]</li> <li>5. Technological requirements for the construction of abutments - [-]</li> </ol>		
<b>Skills:</b>		
<ol style="list-style-type: none"> <li>1. choose the method of installation or construction of the proposed bridge - [-]</li> <li>2. pre-design stage and formwork for the concrete bridge - [-]</li> <li>3. Perform a concreting plan - [-]</li> <li>4. design a scaffold for the assembly of the multi span steel bridge - [-]</li> <li>5. design formwork for bridge concrete deck - [-]</li> <li>6. knowledge of bridge equipment - [-]</li> </ol>		
<b>Social competencies:</b>		

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 bargs.  
 supports construction scaffolding, steel structure bridge zerspolonego wieloprzęsłowego, bridge formwork panels,  
 Erection of cable-stayed bridge and hanging bridges

#### Basic bibliography:

1. Arkadiusz Madaj, Witold Wołowicki: Budowa i utrzymanie mostów. Wymagania techniczne, badania, naprawy. WKŁ. Warszawa2001
2. Kazimierz Furtak, Witold Wołowicki; Rusztowania mostowe. WKŁ. Warszawa 2007
3. Leszek Janusz, Arkadiusz Madaj: Obiekty inżynierskie z blach falistych. WKŁ. Warszawa2007
4. Jan Biliszczuk: Mosty podwieszane. Projektowanie i realizacja. Arkady, Warszawa2005
5. Józef Głomb Technologia budowy mostów betonowych. WKł. Warszawa 1982
6. Arkadiusz Madaj, Witold Wołowicki: Budowa i utrzymanie mostów. Wymagania techniczne, badania, naprawy. WKŁ. Warszawa2001
7. Kazimierz Furtak, Witold Wołowicki; Rusztowania mostowe. WKŁ. Warszawa 2007
8. Leszek Janusz, Arkadiusz Madaj: Obiekty inżynierskie z blach falistych. WKŁ. Warszawa2007
9. Jan Biliszczuk: Mosty podwieszane. Projektowanie i realizacja. Arkady, Warszawa2005
10. Józef Głomb Technologia budowy mostów betonowych. WKł. Warszawa 1982

#### Additional bibliography:

1. Svensson, Holger.: Cable-Stayed Bridges . Ernst & Sohn, Berlin 2012
2. Paul Mondorf .: Concrete Bridges.: CRC Press (September 14, 2006)
3. W.F. Chen Lian Duan: Bridge Engineering Handbook . Crc Employee. CRC Press 1999.
4. Gerhard Mehlhorn: Handbuch Bruecken. Springer-Verlag, Berlin, Heidelberg, New York 2010
5. Materiały z seminarium: Współczesne metody wzmocnienia i przebudowy mostów. Poznań( lata 1995-2012)
6. Svensson, Holger.: Cable-Stayed Bridges . Ernst & Sohn, Berlin 2012
7. Paul Mondorf .: Concrete Bridges.: CRC Press (September 14, 2006)
8. W.F. Chen Lian Duan: Bridge Engineering Handbook . Crc Employee. CRC Press 1999.
9. Gerhard Mehlhorn: Handbuch Bruecken. Springer-Verlag, Berlin, Heidelberg, New York 2010

### Result of average student's workload

Activity		Time (working hours)
1. Participation in lectures		60
2. Preparing for exam		30
Student's workload		
Source of workload	hours	ECTS
Total workload	120	6
Contact hours	60	4
Practical activities	60	2