STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Bridges-Design**		Code **1010101171010125400**
Field of study **Civil Engineering First-cycle Studies**	Profile of study (general academic, practical) **general academic**	Year /Semester **4 / 7**
Elective path/specialty **-**	Subject offered in: **Polish**	Course (compulsory, elective) **elective**
Cycle of study: **First-cycle studies**	Form of study (full-time,part-time) **full-time**	
No. of hours Lecture: **30** Classes: **-** Laboratory: **-** Project/seminars: **-**		No. of credits **4**
Status of the course in the study program (Basic, major, other) **other**	(university-wide, from another field) **university-wide**	
Education areas and fields of science and art		ECTS distribution (number and %)

Responsible for subject / lecturer:

dr inż. Iwona Jankowiak
email: iwona.jankowiak@put.poznan.pl
tel. 61 647 58 28
Faculty of Civil and Environmental Engineering
ul. Piotrowo 5, 60-965 Poznań

Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Knowledge of the strength of materials, structural mechanics, concrete structures, steel structures and Fundamentals of Bridge Engineering in the field of engineering degree studies
2	**Skills**	Skills related to the static calculations and design of concrete and steel structures, skills of formation simple bridge structure, self-learning skills
3	**Social competencies**	Ability to adapt of the type of any civil engineering structure to the communication requirements and social expectations, respect for the Polish language, understand the need for lifelong learning and group collaboration

Assumptions and objectives of the course:

Familiarizing of students with the issues of conceptual design, structural analysis and mechanical design of different types of concrete and steel bridges performed in different technologies according to the system of European standards PN-EN

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. Student knows the specifics of the work and design of bridges - [K_W05, K_W10]
2. Student knows the basis for calculating the main structural elements of bridge structures - [K_W07, K_W09]
3. Student knows the procedure for the static-strength calculations of concrete structures according to the system of the PN-EN code - [K_W06]

Skills:

1. Student can perform the basic static-strength calculations of main structural components of any bridge - [K_U02, K_U04]
2. Student can conduct calculations in accordance with the principles set out in the new system of European standards PN-EN - [K_U08]

Social competencies:

1. Student can adapt the type of structure to the communication requirements and social expectations - [K_K08]
2. Student can collaborate and work together in a group, is aware of the need for self-education - [K_K01, K_K03]
3. Student complies with the principles of the Polish language and the rules of preparation of technical documentation - [K_K07]

Assessment methods of study outcomes

Written test of the student's knowledge in the field of material presented during the lectures

Course description

1. General principles for design of bridge structures
2. Preparation of the static calculation of bridge structures (moving loads, influence lines of the internal forces, envelopes of the internal forces, etc.)
3. Consideration the impact of the phases of structure work during construction for static calculations and design of bridges
4. Rules of dimensioning of concrete, steel and composite structural elements according to PN-EN (fulfillment of the conditions of the limit state method)
5. Designing the basic structural elements of bridges: main girders (beam, plate, boxes, lattice), concrete bridge decks and decks in steel bridges, pavement cantilevers, etc.
6. Designing and dimensioning of bridge supports (abutments)

Basic bibliography:

1. Arkadiusz Madaj, Witold Wołowicki, Podstawy projektowania budowli mostowych, WKiŁ Warszawa 2003/2007
2. Arkadiusz Madaj, Witold Wołowicki, Projektowanie mostów betonowych, WKiŁ Warszawa 2010
3. Arkadiusz Madaj, Witold Wołowicki, Mosty betonowe WKŁ 1980/2002/...
4. Andrzej Ryżyński, Witold Wołowicki, Jacek Skarżewski, Janusz Karlikowski, Mosty stalowe, PWN, Warszawa-Poznań 1984

Additional bibliography:

1. Jacek M. Skarżewski, Witold Wołowicki, Krzysztof Sturzbecher, Mosty sprężone. Przewodnik do ćwiczeń projektowych, Wydawnictwo PP, Poznań, 1989
2. Kazimierz Furtak, Mosty zespolone, PWN, Warszawa-Kraków 1999

Result of average student's workload

Activity	Time (working hours)
1. Participation in lectures	30
2. Studying	30

Student's workload

Source of workload	hours	ECTS
Total workload	60	4
Contact hours	30	2
Practical activities	0	0