STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Concrete Bridges		**1010101161010120221**

Field of study	Profile of study (general academic, practical)	Year /Semester
Civil Engineering First-cycle Studies	**general academic**	**3 / 6**
Elective path/specialty	Subject offered in:	Course (compulsory, elective)
-	**Polish**	**elective**

Cycle of study:	Form of study (full-time,part-time)
First-cycle studies	**full-time**

No. of hours				No. of credits
Lecture: **30**	Classes: **15**	Laboratory: **-**	Project/seminars: **15**	**5**

Status of the course in the study program (Basic, major, other)	(university-wide, from another field)
other	**university-wide**

Education areas and fields of science and art	ECTS distribution (number and %)
technical sciences	**5 100%**
Technical sciences	**5 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	The basics of building statics and the strength of materials. The rules of loads determination. Knowledge concerning reinforced concrete theory and concrete technology.
2	**Skills**	Determination of ?influence lines? and inner forces. Determination of loads acting on constructions. Calculation of reinforced cross-sections concerning general structures. Preparation of constructional drawings.
3	**Social competencies**	The awareness of constant gaining knowledge. The ability to form ideas and communicate among the group. The proper use of polish language. Appropriate behavior.

Assumptions and objectives of the course:

-Learning the basic features of materials used in concrete bridges. Learning general rules of calculation, design and building concrete bridges. The basics of strength calculations in concrete structures (reinforced concrete and prestressed concrete).

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

Knowledge:

1. Features of materials used in concrete bridges - [K_W14]
2. Static systems of concrete bridges - [K_W08]
3. Basic methods of concrete bridges building and their influence on the design process - [K_W05]
4. The basics of strength calculation of concrete bridges - [K_W07]

Skills:

1. To determine a cross-section of a concrete bridge - [K_U07]
2. To determine the static system of a concrete bridge - [K_U07]
3. To carry out strength calculations of a concrete bridge - [K_U08]

Social competencies:

1. The awareness of constant gaining knowledge. - [K_K03]
2. The communication among the group in terms of communicational engineering. - [K_K01]
3. The ability to justify the chosen construction al solutions. - [K_K09]

Assessment methods of study outcomes

-Test at the end of auditory lessons. Constant verification of the project; oral defense of the project. Written exam (lectures).

Course description

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General information about the rules of concrete bridges calculations and materials used in concrete bridges building. Static systems of concrete bridges. The determination of cross-sections and longitudal shape of concrete bridges. Technology of realization and its influence on the inner forces distribution. The supports of concrete bridges. The rules of bearing determination in concrete spans. The rules of concrete bridges calculations, the calculations of span slabs, the determination of inner forces ? computational models of chosen static systems, calculation and forming of slab and girder concrete bridges with simple static systems. The basics of reinforced concrete and prestressed concrete design.

Basic bibliography:

1. . A.Madaj, W.Wołowicki: Mosty betonowe. Wymiarowanie i konstruowanie, WKŁ, 2002
2. A.Madaj, W.Wołowicki: Projektowanie mostów betonowych, WKŁ, Warszawa, 2010
3. A.Madaj, W.Wołowicki: żelbetowe konstrukcje mostowe. Wymiarowanie. Wyd. PP, Poznań, 1995
4. PN-EN 1991-2 Eurokod 2. Projektowanie konstrukcji z betonu. Część 2: Mosty z betonu. Obliczanie i reguły konstrukcyjne
5. PN-EN-1991-1-1 Eurokod 2. Projektowanie konstrukcji z betonu. Część 1-1 Reguły ogólne i reguły dla budynków
6. . PN-91/S-10042 Obiekty mostowe . Konstrukcje betonowe, żelbetowe i sprężone. Projektowanie

Additional bibliography:

1. Szczygieł J. Mosty z betonu zbrojonego i sprężonego, WKŁ, Warszawa, 1978
2. Leonhardt F.: Podstawy budowy mostów betonowych. WKŁ, Warszawa 1982
3. Kmita J.: Mosty betonowe. Cz. I, Podstawy kształtowania, Cz. II, Podstawy wymiarowania, WKŁ, Warszawa 1994
4. Wasiutyński Z.: Budownictwo Betonowe. T. XIV Mosty, Arkady, Warszawa 1967, 1973

Result of average student's workload

Activity	Time (working hours)

Student's workload

Source of workload	hours	ECTS
Total workload	90	5
Contact hours	60	3
Practical activities	30	2