

REPAIR AND REINFORCEMENT OF HISTORIC STRUCTURES

General information	
<i>Subject</i>	Repair And Reinforcement Of Historic Structures
<i>Faculty</i>	Faculty of Civil Engineering, Architecture and Environmental Engineering
<i>Course of study</i>	Architecture
<i>Profile</i>	General academic
<i>Type of study</i>	II level with the degree of M.Sc. Eng. Arch.
<i>Starting semester</i>	Winter semester

Information about the subject	
<i>Semester</i>	2
<i>Number of ECTS points</i>	2
<i>Subject type</i>	obligatory
<i>Language of instruction</i>	English
<i>Syllabus prepared by</i>	Dr hab. inż. Adam Wysokowski, prof. UZ

Type of class					
<i>Course type</i>	<i>Number of classes per semester (full time studies)</i>	<i>Number of classes per week (full time studies)</i>	<i>Number of classes per semester (part time studies)</i>	<i>Number of classes per week (part time studies)</i>	<i>Credit type</i>
lecture	30	2	-	-	Credit with a grade

Subject objective
<ol style="list-style-type: none"> 1. The aim in the field of knowledge is to introduce students to the problems of repairing and strengthening of historical buildings and structures. 2. The aim of skills is to teach students the proper selection of technologies and materials used in the repair and strengthening of structures and the way of their practical implementation. 3. The aim of the personal and social competence is to prepare the student to the appropriate interdisciplinary approach to the construction and choose the right way to repair and strengthen with no interfere to historic character of the structure.

Initial requirements
<p>Formal: Finished first degree course.</p> <p>Informal: Basics knowledge of general construction. Basic knowledge of load-bearing systems used in construction. Basic knowledge about materials and technologies of repairs and reinforcement of constructions including historic constructions.</p>

Subject scope
<p>The specificity of maintaining historic structures. Elements of diagnostics of building structures. Ways of historical repairs of building constructions - traditional and modern technologies. Ways of strengthening historical building constructions - traditional and modern methods - a full review.</p> <p>Lecture program:</p> <ul style="list-style-type: none"> - Introducing students to the subject matter. - Discussion of the procedure of historical buildings.

- Repair and strengthening of building structures in the light of the legislation.
- Repair and strengthening the foundations of the structure.
- Repair and strengthening of masonry structures.
- Repair and strengthening of wooden structures.
- repair and reinforcement of roads surfaces and lower structural layers.
- Repair and reinforcement of structures using carbon tape (CFRP)
- Examples of repairs and reinforcement of construction elements.
- Examples of repairs and strengthening of building structures.
- Development trends in the application of repair and reinforcement.

Educational methods

Conversational lecture with the use of multimedia techniques.

Education results and verification methods

<i>Description</i>	<i>Symbol</i>	<i>Verification method</i>	<i>Type of class</i>
The student knows the methods, technologies and materials used to maintain and strengthen historical constructions. Has knowledge about development trends and significant new achievements in the field of repair and strengthening of historical structures.	K_W03 K_W07	– test - oral, descriptive, etc.	lecture
The student is able to acquire information from various available sources, interpret them in order to be able to apply these modern technologies to repair and strengthen buildings. The student is able to develop a way to repair or strengthen a historical object from taking into account modern materials and technologies.	K_U02 K_U08	– test - oral, descriptive, etc.	lecture
The student is able to think in a creative way in the field of the subject is aware the consequences for the decisions made regarding the use of new materials and technologies.	K_K02	– observation and evaluation of participation in class	lecture

Requirements to obtain a credit

Regular attendance on classes (lectures).

Student's work

<i>Student's work</i>	<i>Full time study (h)</i>
Interaction with the teacher (classes; consultations; exam, etc.)	45
Student's individual work (preparation for the classes, test exam; literature research preparation of: written paper, project, presentation, report, speech; etc.)	15
<i>Total</i>	60
<i>ECTS points</i>	
	<i>Full time study</i>
Work with a teacher	2
Work without a teacher	0
<i>Total</i>	2

Basic literature

1. Masłowski E., Spizewska D. Wzmacnianie konstrukcji budowlanych. Arkady 2002
2. Kotwica J. Konstrukcje drewniane w budownictwie tradycyjnym. Arkady 2009
3. Kazimierowicz-Frankowska K. Wzmacnianie konstrukcji dróg geosyntetykami. WKiŁ 2014
4. Robson Patric. Structural Repair of Traditional Buildings. Routledge Taylor&Francis London and

New York, 1999

5. Gahlot P. S., Sharma Sanjay. Building Repair and Maintenance Management. CBS Publishers & Distributors, 2010

6. Sokalska A. Możaryn T. Naprawa i ochrona konstrukcji żelbetowych. Wydawnictwo ITB, Warszawa 2012

7. Rudziński L. Konstrukcje drewniane - Naprawy, wzmocnienia, przykłady obliczeń -Wydanie II. Wydawnictwo Politechniki Świętokrzyskiej 2010

8. Urban T. Wzmacnianie konstrukcji żelbetowych metodami tradycyjnymi. Wydawnictwo Naukowe PWN Warszawa, 2015 r.

9. Runkiewicz L. Wzmacnianie konstrukcji żelbetowych. Wydawnictwo ITB, Warszawa 2011 r.

10. Czarnecki L, Garbacz A., Łukowski P. Naprawa i ochrona konstrukcji z betonu. Wydawnictwo Naukowe PWN, Warszawa 2016 r.

Complementary literature

1. Zespół autorski. Budownictwo ogólne. Stalowe konstrukcje budynków. Projektowanie według eurokodów z przykładami obliczeń, tom 5, Arkady 2010 r.

2. Zespół autorski. Budownictwo ogólne - tom 4: Konstrukcje budynków, Arkady, 2009 r.

3. Furtak K., Radomski W. Obiekty mostowe - naprawy i remonty. Politechnika Krakowska, 2006 r.

4. Muczko A., Stefański E. Modernizacja i naprawa mostów żelbetowych. WKiŁ Warszawa 1981 r.

5. Książki konferencyjne z Konferencji o tematyce wzmacniania i renowacji konstrukcji historycznych.

Notes

Classroom with equipment for multimedia presentations.