

FATIGUE AND DURABILITY OF BRIDGE STRUCTURES

Course code: **06.4--WILŚ- BUD- ZTKM- DC12**

Type of course: obligatory

Language of instruction: Polish

Director of studies: dr hab. inż. Adam Wysokowski, prof. UZ
Department of Road and Bridges

Name of lecturer: dr hab. inż. Adam Wysokowski, prof. UZ

Form of instruction	Number of teaching hours per semester	Number of teaching hours per week	Semester	Form of receiving a credit for a course	Number of ECTS credits allocated	
Full-time studies						
Lecture	15	1	III	grade	1	
Class						
Laboratory						
Seminar						
Workshop						
Project						
Part-time studies						
Lecture	10	1	III	grade		
Class						
Laboratory						
Seminar						
Workshop						
Project						

COURSE AIM:

The aim of the course is to acquaint students with the problems of fatigue and durability of bridge structures.

ENTRY REQUIREMENTS:

Basics of bridge engineering, basics of steel bridges, basics of dynamics in bridges.

THEMATIC SCOPE OF COURSE:

Lecture:

Introduction. Bridges service loads. Fatigue of materials. Fatigue of structures. Exploitation durability bridges. Influence of corrosion on steel bridge fatigue. Corrosion of steel and concrete bridges. Influence of maintenance on the durability bridges.

LEARNING OUTCOMES:

Knowledge

The student has advanced knowledge in the following areas: fatigue processes and issues related to the durability of bridge structures (K_W02). He knows the methods and technologies to counteract the negative phenomena reducing durability of bridge structures (K_W03, K_W04).

Skills

The student is able to understand the phenomenon of fatigue in the construction of bridges, as well as know the parameters that influence the formation of negative processes, and therefore is able to use these issues in engineering practice (K_U04).

Social competence

Student is able to think and act in an entrepreneurial manner (K_K01). Is aware of the consequences and responsibility for decisions in the field of corrosion protection including their impact on the environment (K_K02).

LEARNING OUTCOMES VERIFICATION AND ASSESSMENT CRITERIA:

Lecture:

Condition for passing grade is regular attendance at lectures and getting a positive grade of the colloquium.

Student workload:

Contact with the lecturer	15lect+3cons	18 h.
Preparing for the colloquium		7 h,
Individual work		5 h,
Total	18+7+5	30 h,
Number of ECTS credits allocated	30/30	1 ECTS.

RECOMMENDED READING:

1. Karlikowski J., Madaj A., Wołowicki W., Mostowe konstrukcje zespolone stalowo-betonowe. WKiŁ 2007r
2. Czudek H., Wysokowski A., Trwałość mostów drogowych. Wyd. WKiŁ Warszawa 2005r
3. Zobel H., Alkhafaji T., Mosty drewniane. WKiŁ, Warszawa 2006r
4. Madaj A., Wołowicki W., Budowa i utrzymanie mostów. WKiŁ Warszawa 2007r
5. Czarnecki L., Emmons P.H. Naprawa i ochrona konstrukcji betonowych Kraków 2002

OPTIONAL READING:

1. Praca zbiorowa., Mosty składane, projektowanie budowa i eksploatacja. GDDKiA, Warszawa 2005r
2. Janusz L., Madaj A., Obiekty inżynierskie z blach falistych. Projektowanie i wykonawstwo. WKiŁ Warszawa 2007r
3. Kłasztorny M., Dynamika mostów belkowych obciążonych pociągami szybkobieżnymi. Wydawnictwo WNT, 2005r

4. Furtak K., Radomski W., Obiekty mostowe - naprawy i remonty, Politechnika Krakowska, 2006r
5. Sędek P., Łagoda M., Radoń A., Zalecenia w sprawie wykonywania połączeń spawanych mostów w czasie ich eksploatacji. Wydawnictwo IBDiM, Warszawa 1998.
6. Dupré J., Bridges. A history of the most famous and important spans. Könemann 1997r