



1. Course number and name

RB-S1-19-W43-A8, **Bridges**

2. Credits and contact hours*

2 ECTS, lectures: 20 hours**, project: 10 hours**

3. Instructor's or course coordinator's name

Grzegorz Poprawa PhD

4. Text book, title, author, and year

- Bridges: A History of the World's Most Spectacular Spans; Judith Dupré; 2017.
- ICE Manual of Bridge Engineering: Second Edition; Gerard Parke and Nigel Hewson; 2008.

a. other supplemental materials

- EN 1990:2002 Eurocode: Basis of structural design.
- EN 1991-2:2003 Eurocode 1: Actions on structures - Part 2: Traffic loads on bridges.

5. Specific course information

a. brief description of the content of the course (catalog description)

Lectures:

This course covers basic topics in bridge engineering. The focus is on classification of main structure types, definition of bridge elements and presentation of different erection technologies. It also discusses bridge loads and principles of their structural behavior.

Fundamentals - conceptual design, aesthetics, bridge loads. Superstructure - classification and description of various bridge types made of concrete, steel, steel-concrete composites, and timbers; horizontally curved, truss, arch, cable-stayed, suspension, floating, movable, railroad bridges, and footbridges. Substructure - piers and columns, towers, abutments, geotechnical considerations, footings, and foundations. Various bridge components - bearing and expansion joints, deck systems, approach slabs, railings, hydro protection, and sewage system.

Project:

Conceptual design of a road or railway bridge (depending on individual project input data).

b. prerequisites or co-requisites

Introductory courses on: Structural Mechanics, Concrete Structures, Steel Structures



c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program

Required.

6. Specific goals for the course

a. specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic

The student can:

- identify and discuss a structural system of a given bridge,
- discuss the importance of various bridge components,
- properly select structural system of a bridge for typical obstacles,
- prepare conceptual drawings of a bridge.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

K1A_W04, K1A_W06, K1A_U03, K1A_U12

7. Brief list of topics to be covered

1. Fundamentals – introduction to bridge engineering,
2. Bridges in the world and Poland
3. Bridge structural systems,
4. Bridge supports,
5. Steel bridges,
6. Concrete bridges,
7. Ancillary bridge components,
8. Bridge technologies,
9. Conceptual design of bridges,
10. Project introduction.

*- Consultations were not included in the contact hours

** -per semester