



1. Course number and name

RB-S1-19-S73-D7, **Bridges to Future**

2. Credits and contact hours*

2 ECTS, lectures: 30 hours**

3. Instructor's or course coordinator's name

Marek Salamak PhD, DSc/University Professor

4. Text book, title, author, and year

- Eastman C., Teicholz P., Sacks R., Liston K., BIM Handbook: A Guide to Building Information Modeling for Owners, Managers, Designers, Engineers and Contractors, John Wiley & Sons
- Team, Bridge Design Manual, PCI, Chicago 2005
- Kapur J., Bridge Design Manual LRFD, WSDOT, Washington 2012

[a. other supplemental materials](#)

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.

[b. prerequisites or co-requisites](#)

No prerequisites and additional requirements.

[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:

- has knowledge of the principles of bridge formation with the principles of mechanics and strength of materials,
- knows the basic standards and principles of design and dimensioning of reinforced concrete and steel main girders,
- can classified bridge structures.
- is able to define and assemble load fixed and movable bridges,
- is able to work independently and formulate opinions about technological processes in bridge engineering.
- independently complements and extends the knowledge is aware of improve own competence.

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

K1A_W10, K1A_U12

7. Brief list of topics to be covered

1. Bridge Fundamentals.
2. BrIM Technology.
3. Current State Records in Bridges.
4. Bridge Design Inspirations.
5. City Bridges.
6. Footbridges.
7. Bridge Management Systems.
8. Prestressed Concrete Bridges.
9. Bridge Components. Polymer Composite Bridges.
10. Bridge Erection Technologies.
11. Future of Timber Bridges.
12. Future of Concrete for Bridges.
13. Bridge Aesthetic.
14. Pasta Bridge Challenge.

*- Consultations were not included in the contact hours

** -per semester