COURSE DESCRIPTION CARD - SYLLABUS

Course name
Steel bridges

Course

Field of study
Civil engineering

Year/Semester
II/3

Area of study (specialization)
Road, bridge and railway engineering

Profile of study
general academic

Level of study
Second-cycle studies

Course offered in
polish

Form of study
part-time

Requirements
compulsory

Number of hours

Lecture
10

Laboratory classes

Other (e.g. online)

Tutorials
8

Projects/seminars
10

Number of credit points

4

Lecturers

Responsible for the course/lecturer:
Wojciech Siekierski

Responsible for the course/lecturer:

Prerequisites

steel structures, strength of materials, building mechanics

Course objective

transfer of knowledge in the field of analysis of: a) orthotropic decks, b) box girders, c) thermal and rheological phenomena in composite bridges, d) spans made of encased steel beams, e) rigid chord in a truss girder

Course-related learning outcomes

Knowledge

a) knows in depth the principles of analysis, construction and dimensioning of elements and connections in selected buildings

b) has advanced detailed knowledge of material strength issues, material and structure modeling; has knowledge of the theoretical basis of the Finite Element Method and general principles of nonlinear calculations of engineering structures

c) knows the principles of design, construction and operation of selected buildings in greater depth

d) has advanced detailed knowledge of the theoretical basis of the analysis and optimization of structures and the design of selected buildings

Skills

a) is able to assess and compile loads acting on simple and complex building structures

b) is able to design elements and connections in complex construction objects, working individually or in a team

c) can perform classic static and dynamic analysis and stability analysis of rod structures (trusses, frames and tendons) statically determinate and indeterminate and surface structures (shields, plates, membranes and shells)

d) is able to correctly define a computer computational model and conduct an advanced linear analysis of complex buildings, their elements and connections, and apply basic techniques of non-linear calculations along with a critical evaluation of the results of numerical analysis

Social competences

a) is responsible for the reliability of the obtained results of his work and the work of his team

b) is ready to independently supplement and expand knowledge in the field of modern processes and technologies in construction

c) is aware of the need to improve professional and personal competences, is ready to critically evaluate the knowledge and content received

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

lecture: written exam; pass mark: 50% of points

exercises: final test; pass mark: 50% of points

project: assessment of the correctness of the exercise performed

Programme content

structure, analysis and technology of orthotropic deck, box girder analysis, analysis of thermal and rheological phenomena in composite bridges, analysis of spans made of steel encased beams, analysis of a rigid chord in a truss girder

Teaching methods

lecture: multimedia presentation supported by the content provided on the blackboard

exercises: multimedia presentation supported by the content given on the blackboard and carrying out the tasks given by the teacher - practical exercises

project: carrying out a task given by the teacher

Bibliography

Basic

Madaj A., Karlikowski J., Wołowicki W., Mosty zespolone stalowo-betonowe, WKŁ, Warszawa, 2016

Ryżyński A., Wołowicki W., Karlikowski J., Skarżewski J., Mosty stalowe. PWN, Warszawa-Poznań, 1984

Karlikowski J., Sturzbecher K., Mosty stalowe. Przewodnik do ćwiczeń projektowych. Wyd. PP, Poznań, 1993

Czudek H., Pietraszak T., Stalowe pomosty użebrowane. Obliczenia i konstruowanie. Arkady, Warszawa, 1978

Additional

Cusens A.R., Pama R.P., Analiza statyczna pomostów. WKŁ, Warszawa, 1981

Flaga A. Mosty dla pieszych. WKŁ, Warszawa, 2011

Jarominiak A., Mosty podwieszone. Oficyna Wyd. Politechniki Rzeszowskiej, Rzeszów, 1998

Biliszczuk J., Mosty podwieszone. Projektowanie i realizacja. Arkady, Warszawa, 2005

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,0
Classes requiring direct contact with the teacher	28	1,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	72	3,0

[1] delete or add other activities as appropriate