

## FACULTY OF ARCHITECTURE

## COURSE SYLLABUS

Course title in Polish: **Nowoczesne systemy konstrukcyjne**Course title in English: **Modern Structural Systems**Main field of study (if applicable): **Architecture**

Specialization (if applicable): -

Profile: **academic**Level and form of studies: **1st level, full-time**Course type: **optional**Course code: **AUA000337S**Group of courses: **NO**

	Lecture	Tutorial	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)					<b>30</b>
Number of hours of total student workload (CNPS)					<b>90</b>
Form of crediting					<b>Crediting with grade</b>
For group of courses mark (X) final course					
Number of ECTS points					<b>3</b>
including number of ECTS points for practical (P) classes					<b>1</b>
including number of ECTS points for direct teacher-student contact (BK) classes					<b>1</b>

### PREREQUISITES RELATED TO KNOWLEDGE, COMPETENCES AND SOCIAL SKILLS

### COURSE OBJECTIVES

- C1** - Implementation of basic static schemes for structures.  
**C2** - Application of bar structures for roofs.  
**C3** - Analyzing cable nets in different surfaces.  
**C4** - Implementation of post-tension concrete structures.  
**C5** - Shaping geometry of suspended roofs and footbridges.  
**C6** - Shaping the membrane surfaces.  
**C7** - Creating geometry of spatial structures.  
**C8** - Using optimization method for modern spatial structures.

### COURSE LEARNING OUTCOMES

#### Relating to knowledge:

**PEK\_W01** - Describe the main idea of shaping structures. (K1A\_W04)**PEK\_W02** - Describe systems of technology used in modern structures. (K1A\_W04)

#### Relating to competences:

**PEK\_U01** - Calculate structures for simple structural elements. (K1A\_U07)**PEK\_U02** - Design a system of technology for different types of buildings. (K1A\_U07)**PEK\_U03** - Analyzing recent effects of researches on modern structural systems. (K1A\_U08)

**Relating to social skills:****PEK\_K01** - Individual studies on examples of modern structures. (K1A\_K01)**PEK\_K02** - Technical discussion on seminar class. (K1A\_K02)**PROGRAMME CONTENT**

<b>Seminar</b>		<b>Number of hours</b>
Sem 1	Constructing static schemes for structures with large spans.	2
Sem 2	Application of bar shells to the roofs of exhibition halls.	2
Sem 3	Cable covers for compressed sports facilities.	2
Sem 4	Reinforced concrete structures in industrial halls.	2
Sem 5	Examples of solutions for suspended roofs and footbridges.	2
Sem 6	Temporary exhibition facilities and canopies using membranes.	2
Sem 7	Multilayer parking lots.	2
Sem 8	Bar spatial structures, shaping and optimization.	2
Sem 9	Single-layer rod coatings, geometrical systems of meshes.	2
Sem 10	Flat cable trusses and compressed cable nets.	2
Sem 11	Hanging structures using membrane systems.	2
Sem 12	High rise buildings.	2
Sem 13	Examples of special foundation design.	2
Sem 14	Concrete thin shells coverings.	2
Sem 15	Geometrical solids in structural design.	2
<b>Total hours</b>		<b>30</b>

**TEACHING TOOLS****N1** - Expository lecture with elements of problem-solving.**N2** - Multimedia presentations.**N3** - Interactive discussion about designing solutions developed during lectures and tutorials.**N4** - Preparation of an assignment in the form of a report.**ASSESSMENT OF ACHIEVEMENT OF LEARNING OUTCOMES**

<b>Evaluation</b> (F – forming (during semester), C – concluding (at semester end))	<b>Number of learning outcome</b>	<b>Method of assessing the achievement of learning outcome</b>
F1	PEK_W01 PEK_W02 PEK_U03	Presentation.
F2	PEK_W02 PEK_U01 PEK_U02 PEK_U03	Report.
<b>C = 80% F1+20% F2</b>		

<b>BASIC AND ADDITIONAL LITERATURE</b>
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<b><u>BASIC LITERATURE:</u></b>
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| <ul style="list-style-type: none"><li>[1] Zalewski W., Allen E., <i>Form and Forces</i>, New York 2009.</li><li>[2] McCormac J.C., <i>Structural Analysis: Using Classical and Matrix Methods</i>, Hoboken 2007.</li><li>[3] Hemp, W.S., <i>Optimum Structures</i>, Oxford 1973.</li></ul> |
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<b><u>ADDITIONAL LITERATURE:</u></b>
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| <ul style="list-style-type: none"><li>[1] <i>Structural Morphology</i>, IASS Conference materials, Nottingham 1997.</li></ul> |
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<b>COURSE SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)</b>
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