

POLITECHNIKA KRAKOWSKA IM. TADEUSZA KOŚCIUSZKI

KARTA PRZEDMIOTU

obowiązuje studentów rozpoczynających studia w roku akademickim 2021/2022

Wydział Inżynierii Lądowej

Kierunek studiów: Budownictwo

Profil: Ogólnoakademicki

Forma studiów: stacjonarne

Kod kierunku: BUD

Stopień studiów: II

Specjalności: Structural Design and Management in Civil Engineering (profile: Construction Technology and Management), Structural Design and Management in Civil Engineering (profile: Structural Design)

1 INFORMACJE O PRZEDMIOCIE

NAZWA PRZEDMIOTU	Konstrukcje drewniane II
NAZWA PRZEDMIOTU W JĘZYKU ANGIELSKIM	Timber Structures II
KOD PRZEDMIOTU	WIL BUD oIIS D9 21/22
KATEGORIA PRZEDMIOTU	Specialty subjects
LICZBA PUNKTÓW ECTS	2.00
SEMESTRY	2

2 RODZAJ ZAJĘĆ, LICZBA GODZIN W PLANIE STUDIÓW

SEMESTR	WYKŁAD	ĆWICZENIA AUDYTORYJNE	LABORATORIA	LABORATORIA KOMPUTERO- WE	PROJEKTY	SEMINARIUM
2	15	0	0	0	15	0

3 CELE PRZEDMIOTU

Cel 1 Presentation of a brief historical outline of the development of wooden structures in terms both of structures and materials.

Cel 2 Acquainting students with materials and structure solutions of complex beam and plate timber structures,

glulam beams, trusses and the principles of their work. Showing examples of objects constituting milestones in the development of wooden structures.

Cel 3 Extend students' knowledge of modern wood based materials (LVL - Laminated Veneer Lumber, PSL - Parallel Strand Lumber, CLT - Cross Laminated Timber etc.). To acquaint students with material technological novelties related to wood.

Cel 4 Extend the students knowledge of the connectors and familiarize them with the connections used in modern timber structures and with the rules of designing joints in such structures.

Cel 5 Familiarize students with the principles of designing timber structures in case of fire. To familiarise students with the protective measures used to protect wood and its structural elements.

Cel 6 Showing the possibilities of shaping large structures such as: high buildings, domes, halls, bridges.

Cel 7 Introducing research issues on wooden and laminated wood construction elements. The importance of slenderness as an element of architectural beauty and at the same time a threat to the static and dynamic of structural elements.

4 WYMAGANIA WSTĘPNE W ZAKRESIE WIEDZY, UMIEJĘTNOŚCI I INNYCH KOMPETENCJI

1 Knowledge from courses: Theoretical Mechanics, Strength of Materials, Structural Mechanics, Technical Drawing, Timber Structures I

5 EFEKTY KSZTAŁCENIA

EK1 Wiedza The student knows the path of historical development of wooden structures with examples of the state-of-the-art solutions.

EK2 Wiedza The student has knowledge in the field of construction of solid and glued laminated wood structures, he also knows examples of modern, contemporary solutions.

EK3 Umiejętności The student is able to pre-design and model complex wooden structures (glulam hall, bridges, observation towers, etc.).

EK4 Umiejętności Student is able to prepare clear forms of the results of his project and of a scientific nature work (introduction and preparation to scientific and research works).

EK5 Wiedza The student is familiar with the basic principles of designing wooden structures in case of fire and knows what wood protection measures are available.

EK6 Kompetencje społeczne Student knows how to work independently or in cooperation in small project team over specific tasks.

6 TREŚCI PROGRAMOWE

PROJEKTY		
LP	TEMATYKA ZAJĘĆ OPIS SZCZEGÓŁOWY BLOKÓW TEMATYCZNYCH	LICZBA GODZIN
P1	Individual project - design of glulam hall (purlin, glulam beam, bracing, connection calculation etc.)	11
P2	Calculation of selected timber structures in case of fire	4

WYKŁAD		
LP	TEMATYKA ZAJĘĆ OPIS SZCZEGÓŁOWY BLOKÓW TEMATYCZNYCH	LICZBA GODZIN
W1	The history of development of wooden structures with the presentation of outstanding examples of world and Polish structures. Part 1.	1
W2	The history of development of wooden structures with the presentation of outstanding examples of world and Polish structures. Part 2.	1
W3	Revision of main timber properties and glulam technology	1
W4	Revision and extension of students knowledge of characteristic and properties of modern wood-based products (glulam, CLT - Cross Laminated Timbers, PSL - Parallel Strand Lumber, LVL- Laminated Veneer Lumber, SIPs-Structural Insulated Panels etc.)	1
W5	Examples of glued laminated timber truss construction. Node construction solutions. Protection against moisture.	1
W6	Selected issues of ULS and SLS designing on the example of glued laminated timber frames and composite sections. Part 1.	1
W7	Selected issues of ULS and SLS designing on the example of glued laminated timber frames and composite sections. Part 2.	1
W8	Different types of connectors used in glulam structures.	1
W9	Examples of interesting solutions for contemporary domes, halls, high buildings, observation towers, masts and bridges. Part 1.	1
W10	Examples of interesting solutions for contemporary domes, halls, high buildings, observation towers, masts and bridges. Part 2.	1
W11	Connection stiffness of timber structures - Rigidity of wooden structure joints	1
W12	Designing of connections in timber structures	1
W13	Prestressed wooden structures - examples of solutions used in bridges.	1
W14	Designing of timber structures in case of fire	1
W15	To acquaint students with material technological innovations related to wood.	1

7 NARZĘDZIA DYDAKTYCZNE

N1 Lectures

N2 Multimedia presentations

N3 Design exercises

N4 Consultations

N5 Educational films

N6 Discussion

8 OBCIĄŻENIE PRACĄ STUDENTA

FORMA AKTYWNOŚCI	ŚREDNIA LICZBA GODZIN NA ZREALIZOWANIE AKTYWNOŚCI
Godziny kontaktowe z nauczycielem akademickim, w tym:	
Godziny wynikające z planu studiów	30
Konsultacje przedmiotowe	0
Egzaminy i zaliczenia w sesji	0
zaliczenie wykładów	1
Godziny bez udziału nauczyciela akademickiego wynikające z nakładu pracy studenta, w tym:	
Przygotowanie się do zajęć, w tym studiowanie zalecanej literatury	9
Opracowanie wyników	6
Przygotowanie raportu, projektu, prezentacji, dyskusji	14
SUMARYCZNA LICZBA GODZIN DLA PRZEDMIOTU WYNIKAJĄCA Z CAŁEGO NAKŁADU PRACY STUDENTA	60
SUMARYCZNA LICZBA PUNKTÓW ECTS DLA PRZEDMIOTU	2.00

9 SPOSOBY OCENY

OCENA FORMUJĄCA

F1 Individual project

F2 Assessment for the pass presentation of the lecture

F3 Passing a lecture presentation - pass conversation

OCENA PODSUMOWUJĄCA

P1 Weighted average of the grades from the project and presentation

WARUNKI ZALICZENIA PRZEDMIOTU

W1 Positive both formulation marks

OCENA AKTYWNOŚCI BEZ UDZIAŁU NAUCZYCIELA

B1 Individual project and presentation

KRYTERIA OCENY

EFEKT KSZTAŁCENIA 1	
NA OCENĘ 3.0	The student knows the path of historical development of wooden structures with examples of the state-of-the-art solutions at a satisfactory level.
NA OCENĘ 3.5	The student knows the path of historical development of wooden structures with examples of the state-of-the-art solutions at a reasonably good level of knowledge.
NA OCENĘ 4.0	The student knows the path of historical development of wooden structures with examples of the state-of-the-art solutions at a good level of knowledge.
NA OCENĘ 4.5	The student knows the path of historical development of wooden structures with examples of the state-of-the-art solutions at a better than good level of knowledge.
NA OCENĘ 5.0	The student knows the path of historical development of wooden structures with examples of the state-of-the-art solutions at a very good level of knowledge.
EFEKT KSZTAŁCENIA 2	
NA OCENĘ 2.0	xxx
NA OCENĘ 3.0	The student has mediocre knowledge in the field of construction of solid and glued laminated wood structures, he also knows examples of modern, contemporary solutions.
NA OCENĘ 3.5	The student has satisfactory knowledge in the field of construction of solid and glued laminated wood structures, he also knows examples of modern, contemporary solutions.
NA OCENĘ 4.0	The student has good knowledge in the field of construction of solid and glued laminated wood structures, he also knows examples of modern, contemporary solutions.
NA OCENĘ 4.5	The student has better than good knowledge in the field of construction of solid and glued laminated wood structures, he also knows examples of modern, contemporary solutions.
NA OCENĘ 5.0	The student has Very good knowledge in the field of construction of solid and glued laminated wood structures, he also knows examples of modern, contemporary solutions.
EFEKT KSZTAŁCENIA 3	
NA OCENĘ 2.0	xxx
NA OCENĘ 3.0	The student is able in mediocre way pre-design and model complex wooden structures.
NA OCENĘ 3.5	The student is able in satisfactory way pre-design and model complex wooden structures.
NA OCENĘ 4.0	The student is able in good way pre-design and model complex wooden structures.
NA OCENĘ 4.5	The student is able in better than good way pre-design and model complex wooden structures.

NA OCENĘ 5.0	The student is able in very good way pre-design and model complex wooden structures.
EFEKT KSZTAŁCENIA 4	
NA OCENĘ 2.0	xxx
NA OCENĘ 3.0	Student is able to prepare in mediocre way clear forms of the results of his project and of a scientific nature work.
NA OCENĘ 3.5	Student is able to prepare in satisfactory way clear forms of the results of his project and of a scientific nature work.
NA OCENĘ 4.0	Student is able to prepare in good way clear forms of the results of his project and of a scientific nature work.
NA OCENĘ 4.5	Student is able to prepare in better then good way clear forms of the results of his project and of a scientific nature work.
NA OCENĘ 5.0	Student is able to prepare in very good way clear forms of the results of his project and of a scientific nature work.
EFEKT KSZTAŁCENIA 5	
NA OCENĘ 2.0	xxx
NA OCENĘ 3.0	The student is familiar with the basic principles of designing wooden structures in case of fire in mediocre way.
NA OCENĘ 3.5	The student is familiar with the basic principles of designing wooden structures in case of fire in satisfactory way.
NA OCENĘ 4.0	The student is familiar with the basic principles of designing wooden structures in case of fire in good way.
NA OCENĘ 4.5	The student is familiar with the basic principles of designing wooden structures in case of fire in better then good way.
NA OCENĘ 5.0	The student is familiar with the basic principles of designing wooden structures in case of fire in very good way.
EFEKT KSZTAŁCENIA 6	
NA OCENĘ 3.0	During the design work and discussions the student demonstrates sufficient group work skills.
NA OCENĘ 3.5	During the design work and discussions the student demonstrates satisfactory group work skills.
NA OCENĘ 4.0	During the design work and discussions the student demonstrates good group work skills.
NA OCENĘ 4.5	During the design work and discussions the student demonstrates better then good group work skills.
NA OCENĘ 5.0	During the design work and discussions the student demonstrates very good group work skills.

10 MACIERZ REALIZACJI PRZEDMIOTU

EFEKT KSZTAŁCENIA	ODNIESIENIE DANEGO EFEKTU DO SZCZEGÓŁOWYCH EFEKTÓW ZDEFINIOWANYCH DLA PROGRAMU	CELE PRZEDMIOTU	TREŚCI PROGRAMOWE	NARZĘDZIA DYDAKTYCZNE	SPOSOBY OCENY
EK1	K_W02 K_W05 K_W07	Cel 1	p1 w1 w2	N1 N2 N3 N4 N5 N6	F1 F2 F3
EK2	K_W02 K_W05 K_W07 K_W14 K_W16	Cel 2	p1 w3 w4 w5	N1 N2 N3 N4 N5 N6	F1 F2 F3 P1
EK3	K_U01 K_U02 K_U03 K_U07 K_U13	Cel 3	p1 p2 w4 w5 w6 w7 w8 w9 w10 w11 w12	N1 N2 N3 N4 N5 N6	F1 F2 F3 P1
EK4	K_U01 K_U02 K_U03 K_U07 K_U09 K_U13 K_U17 K_U18	Cel 3 Cel 4 Cel 5 Cel 6	p1 p2 w5 w6 w7 w8 w9 w10 w11 w12 w13	N1 N2 N3 N4 N5 N6	F1 F2 F3 P1
EK5	K_W04 K_W05 K_W06 K_W07 K_W14 K_K02 K_K06	Cel 4 Cel 5 Cel 6	p1 p2 w6 w7 w8 w9 w10 w11 w12 w13 w14	N1 N2 N3 N4 N5 N6	F1 F2 F3 P1
EK6	K_K01 K_K02 K_K03 K_K04 K_K05	Cel 7	p2 w13 w14 w15	N1 N2 N3 N4 N5 N6	F3 P1

11 WYKAZ LITERATURY

LITERATURA PODSTAWOWA

- [1] **Parteous A, Kermani A.** — *Structural Timber Design to EC5*, Oxford, 2009, Blackwell Publishing
- [2] **EN 1995-1-1** — *Design of timber structures*, Brussels, 2008, CEN
- [3] **EN 1995-1-2** — *Design of timber structures*, Brussels, 2004, CEN
- [4] **EN 1995-2** — *Design of timber structures*, Brussels, 2004, CEN

LITERATURA UZUPEŁNIAJĄCA

- [1] **Barbara Linz** — *Holz Bois Wood*, Köln, 2009, h.f.ullmann - tandem Verlag GmbH
- [2] **Aicher S, Reinhardt H.-W., Garrecht H.** — *Materials and Joints in Timber Structures Recent Developments od Technology*, RILEM Bookseries, 2014, Springer
- [3] **Aasheim E.** — *Norwegian Timber Bridge Current Trends and Future Directions*, , 0, www.treteknisk.no.

12 INFORMACJE O NAUCZYCIELACH AKADEMICKICH**OSOBA ODPOWIEDZIALNA ZA KARTĘ**

dr inż. Wojciech Średniawa (kontakt: wsrednia@pk.edu.pl)

OSOBY PROWADZĄCE PRZEDMIOT

3 mgr inż. Tomasz Kochański (kontakt: tomasz.kochanski@pk.edu.pl)

4 mgr inż. Klaudia Śliwa - Wieczorek (kontakt: klaudia.sliwa-wieczorek@pk.edu.pl)

5 dr inż. Wojciech Średniawa (kontakt: wsrednia@pk.edu.pl)

13 ZATWIERDZENIE KARTY PRZEDMIOTU DO REALIZACJI

(miejscowość, data)

(odpowiedzialny za przedmiot)

(dziekan)

PRZYJMUJĘ DO REALIZACJI (data i podpisy osób prowadzących przedmiot)

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