

POLITECHNIKA KRAKOWSKA IM. TADEUSZA KOŚCIUSZKI

KARTA PRZEDMIOTU

obowiązuje studentów rozpoczynających studia w roku akademickim 2016/2017

Wydział Inżynierii Lądowej

Kierunek studiów: Budownictwo

Profil: Ogólnoakademicki

Forma studiów: stacjonarne

Kod kierunku: BUD

Stopień studiów: II

Specjalności: Konstrukcje budowlane i inżynierskie - studia w języku angielskim

1 INFORMACJE O PRZEDMIOCIE

NAZWA PRZEDMIOTU	Technologia prefabrykacji betonowej
NAZWA PRZEDMIOTU W JĘZYKU ANGIELSKIM	Technology of Prefabrication
KOD PRZEDMIOTU	WIL BUD oIIS D12 16/17
KATEGORIA PRZEDMIOTU	Przedmioty specjalnościowe
LICZBA PUNKTÓW ECTS	1.00
SEMESTRY	1

2 RODZAJ ZAJĘĆ, LICZBA GODZIN W PLANIE STUDIÓW

SEMESTR	WYKŁAD	ĆWICZENIA AUDYTORYJNE	LABORATORIA	LABORATORIA KOMPUTERO- WE	PROJEKTY	SEMINARIUM
1	0	10	10	0	10	0

3 CELE PRZEDMIOTU

Cel 1 To familiarize students with possibilities and technologies of craftsman and industrialized prefabricated units assembly.

Cel 2 To familiarize students with prefabricated units assortment (both of contemporary and historical systems).

Cel 3 To familiarize students with chosen technologies of precast concrete systems production

- Cel 4** To show future designers the possibilities given by prefabrication industry to replace typical in situ reinforced concrete structures and some steel structure types by precast concrete systems.
- Cel 5** To familiarize students with concrete types characteristic of prefabrication industry, and with designing and preparing concrete mix of chosen types.
- Cel 6** To familiarize students with EU conformity system of concrete products and to show examples of quality control of chosen precast concrete products.

4 WYMAGANIA WSTĘPNE W ZAKRESIE WIEDZY, UMIEJĘTNOŚCI I INNYCH KOMPETENCJI

1 None

5 EFEKTY KSZTAŁCENIA

- EK1 Wiedza** Student knows main assumptions of quality control system and methods of testing quality of typical precast units.
- EK2 Wiedza** Student knows contemporary prefabrication assortment, chosen technologies of precast concrete systems, and chosen aspects concerning quality control of precast units
- EK3 Wiedza** Student knows technologies used in contemporary prefabrication and their advantages and disadvantages.
- EK4 Umiejętności** Student can design exemplary production line in prefabrication plant and to design productivity on each work-stand.
- EK5 Umiejętności** Student can design work of assembly staff and to complete a set of means of production (here: machines and appliances) in a way enabling efficient organization of exemplary prefabricated unit production
- EK6 Wiedza** Student knows basic and special types of concrete used in precast industry and their special features, advantages, disadvantages and usage.
- EK7 Umiejętności** Student can properly proceed with chosen concrete types used in prefabrication (some items of laboratory design).
- EK8 Umiejętności** Student can properly proceed with basic test of quality control of typical precast units.

6 TREŚCI PROGRAMOWE

LABORATORIA		
LP	TEMATYKA ZAJĘĆ OPIS SZCZEGÓŁOWY BLOKÓW TEMATYCZNYCH	LICZBA GODZIN
L1	Introduction (concrete types used in prefabrication industry, their special features, advantages, disadvantages and usage).	1
L2	Concrete compaction methods (vibropressing, vibrating table, poker vibration).	2
L3	Lightweight concrete (structural and of open structure ones).	2
L4	Self-Compacting Concrete	2

LABORATORIA		
LP	TEMATYKA ZAJĘĆ OPIS SZCZEGÓŁOWY BLOKÓW TEMATYCZNYCH	LICZBA GODZIN
L5	Hardening acceleration methods (admixtures and steam curing at atmospheric pressure)	1
L6	Quality control of precast units (test of dimensions and load capacity)	1
L7	Strength testing of produced concrete.	1

ĆWICZENIA AUDYTORYJNE		
LP	TEMATYKA ZAJĘĆ OPIS SZCZEGÓŁOWY BLOKÓW TEMATYCZNYCH	LICZBA GODZIN
C1	Introduction (basic terms and definitions, history of prefabrication, types of structures, units and technologies).	1
C2	Prefabrication of large-size units wall structures and systems.	1
C3	Prefabrication of large-size units floor systems.	1
C4	Prefabrication of large-size units skeleton structures and units.	1
C5	Prefabrication of large-size units units and systems for road construction.	1
C6	Prefabrication of large-size units systems and units for infrastructure structures	1
C7	Prefabrication of small-size units vibropressing (technology and units)	1.5
C8	Prefabrication of small-size units AAC (technology and units)	1
C9	Basics of conformity system in prefabrication and most typical testing methods in quality control of precast concrete units.	1.5

PROJEKTY		
LP	TEMATYKA ZAJĘĆ OPIS SZCZEGÓŁOWY BLOKÓW TEMATYCZNYCH	LICZBA GODZIN
P1	Introduction. Common data for design. Description of technology and production line organization in precast plant. Design of production line productivity.	1.5
P2	Concrete compaction techniques.	2
P3	Formworks and forming of precast units.	1
P4	Strength acceleration techniques in precast plants.	2

PROJEKTY		
LP	TEMATYKA ZAJĘĆ OPIS SZCZEGÓŁOWY BLOKÓW TEMATYCZNYCH	LICZBA GODZIN
P5	Main assembly department (rules of fresh concrete and reinforcement production organization, methodology of refining processes of constituent materials).	2
P6	Storage department (rules for storage yards design and for inner transport organization).	1.5

7 NARZĘDZIA DYDAKTYCZNE

N1 pokaz elementów in vivo

N2 Ćwiczenia projektowe

N3 Konsultacje

N4 Prezentacje multimedialne

N5 Ćwiczenia laboratoryjne

N6 Dyskusja

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	2
Egzaminy i zaliczenia w sesji	1
Godziny bez udziału nauczyciela akademickiego wynikające z nakładu pracy studenta, w tym:	
Przygotowanie się do zajęć, w tym studiowanie zalecanej literatury	8
Opracowanie wyników	1
Przygotowanie raportu, projektu, prezentacji, dyskusji	5
SUMARYCZNA LICZBA GODZIN DLA PRZEDMIOTU WYNIKAJĄCA Z CAŁEGO NAKŁADU PRACY STUDENTA	47
SUMARYCZNA LICZBA PUNKTÓW ECTS DLA PRZEDMIOTU	1.00

9 SPOSOBY OCENY

OCENA FORMUJĄCA

F1 Kolokwium

F2 Projekt indywidualny

F3 Sprawozdanie z ćwiczenia laboratoryjnego

OCENA PODSUMOWUJĄCA

P1 Średnia ważona ocen formujących

WARUNKI ZALICZENIA PRZEDMIOTU

W1 weights for partial tests F1-F3:

W2 laboratory report - mark done/not done (the whole group works together)

W3 Test for EK6-8: 20%

W4 Test for EK1-3: 60%

W5 Individual design ((part EK4 and 5): 20%

OCENA AKTYWNOŚCI BEZ UDZIAŁU NAUCZYCIELA

B1 Projekt indywidualny

KRYTERIA OCENY

EFEKT KSZTAŁCENIA 1	
NA OCENĘ 2.0	Student not fulfilling criteria given for 3.0 mark
NA OCENĘ 3.0	Student knows basic testing methods of precast units possible to be realized in case of shortage of specialized equipment. Criterion of pass: 75% of proper answers.
NA OCENĘ 3.5	See mark 3.0 plus assessment of knowing the following problems: 1) System of conformity of products for building industry in Poland. 2) Quality control system in precast plant. 3) Assessed parameters of precast units not included in requirements for mark 3.0. 4) Chosen methods of assessment of precast units parameters from p.3. Criterion of pass: 25% of proper answers (together with pass criterion for mark 3.0).
NA OCENĘ 4.0	Criterion of pass: 45% of proper answers.
NA OCENĘ 4.5	Criterion of pass: 65% of proper answers.
NA OCENĘ 5.0	Criterion of pass: 85% of proper answers.
EFEKT KSZTAŁCENIA 2	
NA OCENĘ 2.0	Student not fulfilling criteria given for 3.0 mark.

NA OCENĘ 3.0	Student knows basic types of precast units and subdivision of these main assortment groups. Criterion of pass: 75% of proper answers.
NA OCENĘ 3.5	See mark 3.0 plus assessment of knowledge of the following problems: 1) Advantages and disadvantages of described assortment groups of precast units. 2) Technology of production of assortment listed in p. 1. 3) Concrete types used in technologies listed in p. 2 and their characteristics. 4) Aspects of structure erection from chosen precast systems. 5) Aspects of quality control of chosen precast units types. Criterion of pass: 25% of proper answers (together with pass criterion for mark 3.0).
NA OCENĘ 4.0	Criterion of pass: 45% of proper answers.
NA OCENĘ 4.5	Criterion of pass: 65% of proper answers.
NA OCENĘ 5.0	Criterion of pass: 85% of proper answers.
EFEKT KSZTAŁCENIA 3	
NA OCENĘ 2.0	Student not fulfilling criteria given for 3.0 mark.
NA OCENĘ 3.0	1) Student knows basic organization schemes of typical precast plant, production line and methods of their organization. 2) Student knows production process for exemplary units being subject of his/her design topic. 3) Student knows and understands basic production methods used in prefabrication (storage of components for production, production of fresh concrete and reinforcement, forming processes, concrete compaction, acceleration of concrete strength development, storage of final product) Criterion of pass: 66% of proper answers.
NA OCENĘ 3.5	See mark 3.0 plus assessment of knowledge of the following problems: 1) Basic technologies in prefabrication (i.e. used in more than one assortment group) 2) Main assembly line organization of basic technologies (e.g. included in p 1). Criterion of pass: 25% of proper answers (together with pass criterion for mark 3.0).
NA OCENĘ 4.0	Criterion of pass: 45% of proper answers.
NA OCENĘ 4.5	Criterion of pass: 65% of proper answers.
NA OCENĘ 5.0	Criterion of pass: 85% of proper answers.
EFEKT KSZTAŁCENIA 4	
NA OCENĘ 2.0	Student who did not design given production line properly or designed it, but not fulfilling criteria given below.
NA OCENĘ 3.0	Like mark 3.5 in case of one mistake more, or in case of short-term Deans prolongation (not more than 2 mistakes allowed in this case). Students, who do not come for consultation before dead-line (the end of semester) are not allowed to complete design in this way.
NA OCENĘ 3.5	Mark obtained when 3 mistakes are found (in case of finishing the design process before dead-line for mark 5.0) or with 2 mistakes in term up to 1 week after the dead-line, or with 1 mistake in term 1-2 weeks after the dead-line, or with no mistakes in case of finishing the design after more than 2 weeks after dead-line.

NA OCENĘ 4.0	Mark obtained when 2 mistakes are found (in case of finishing the design process before dead-line for mark 5.0) or with 1 mistake in term up to 1 week after the dead-line, or without mistakes in term 1-2 weeks after the dead-line.
NA OCENĘ 4.5	Mark obtained when 1 mistake is found (in case of finishing the design process before dead-line for mark 5.0) or without mistakes in term not longer than 1 week after dead-line.
NA OCENĘ 5.0	Base mark in case of proper design (i.e. without mistakes) which is finished before dead-line (i.e. end of semester). The number of consultations of each design part is limited to 2; after the dead-line only one consultation term is possible.
EFEKT KSZTAŁCENIA 5	
NA OCENĘ 2.0	Student who did not design given production line properly or designed it, but not fulfilling criteria given below.
NA OCENĘ 3.0	Like mark 3.5 in case of one mistake more, or in case of short-term Deans prolongation (not more than 2 mistakes allowed in this case). Students, who do not come for consultation before dead-line (the end of semester) are not allowed to complete design in this way.
NA OCENĘ 3.5	Mark obtained when 3 mistakes are found (in case of finishing the design process before dead-line for mark 5.0) or with 2 mistakes in term up to 1 week after the dead-line, or with 1 mistake in term 1-2 weeks after the dead-line, or with no mistakes in case of finishing the design after more than 2 weeks after dead-line.
NA OCENĘ 4.0	Mark obtained when 2 mistakes are found (in case of finishing the design process before dead-line for mark 5.0) or with 1 mistake in term up to 1 week after the dead-line, or without mistakes in term 1-2 weeks after the dead-line.
NA OCENĘ 4.5	Mark obtained when 1 mistake is found (in case of finishing the design process before dead-line for mark 5.0) or without mistakes in term not longer than 1 week after dead-line.
NA OCENĘ 5.0	Base mark in case of proper design (i.e. without mistakes) which is finished before dead-line (i.e. end of semester). The number of consultations of each design part is limited to 2; after the dead-line only one consultation term is possible.
EFEKT KSZTAŁCENIA 6	
NA OCENĘ 2.0	Student not fulfilling criteria given for 3.0 mark.
NA OCENĘ 3.0	Student knows basic concrete types used in prefabrication and their exemplary application.
NA OCENĘ 3.5	As for mark 3.0 plus knows basic characteristics of concrete types. Criterion of pass: 25% of proper answers.
NA OCENĘ 4.0	Criterion of pass: 45% of proper answers.
NA OCENĘ 4.5	Criterion of pass: 65% of proper answers.
NA OCENĘ 5.0	Criterion of pass: 85% of proper answers.
EFEKT KSZTAŁCENIA 7	

NA OCENĘ 2.0	Student not fulfilling criteria given for 3.0 mark.
NA OCENĘ 3.0	The choice from topics listed below: 1) Student knows and is capable to shortly describe compaction processes for concretes produced in the laboratory meetings. 2) Student knows and is capable to shortly describe quality control tests held in the laboratory meetings. 3) Student can comprehensively describe processes of concrete hardening acceleration by methods shown in the laboratory meetings. 4) Student can comprehensively describe processes of concrete compaction methods shown in the laboratory meetings. 5) Student knows specific tips needed for proper design of concrete types known from the laboratory meetings. Criterion of pass: 50% of proper answers.
NA OCENĘ 3.5	Criterion of pass: 60% of proper answers.
NA OCENĘ 4.0	Criterion of pass: 70% of proper answers.
NA OCENĘ 4.5	Criterion of pass: 80% of proper answers.
NA OCENĘ 5.0	Criterion of pass: 90% of proper answers.
EFEKT KSZTAŁCENIA 8	
NA OCENĘ 2.0	Student not fulfilling criteria given for 3.0 mark.
NA OCENĘ 3.0	Student knows methods of conducting of basic quality assessment methods of precast concrete units (i.e. methods applying only simple equipment and therefore possible to conduct on building site). Criterion of pass: 75% of proper answers.
NA OCENĘ 3.5	See mark 3.0 plus assessment of knowledge of the following problems: 1)System of allowance for selling products for building industry in the UE and in Poland. 2)The structure of quality control (QC) assessment in prefabrication plant 3)The knowledge about typical methods of QC not listed above (i.e. in 3.0 mark criterion) and the chosen methods of their assessment. Criterion of pass: 25% of proper answers (together with pass criterion for mark 3.0).
NA OCENĘ 4.0	Criterion of pass: 45% of proper answers.
NA OCENĘ 4.5	Criterion of pass: 65% of proper answers.
NA OCENĘ 5.0	Criterion of pass: 85% of proper answers.

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_W05 K_W10 K_U11 K_K06	Cel 6	l6 l7 c2 c3 c4 c5 c6 c7 c8 c9	N4 N5	F2 F3 P1
EK2	K_W02 K_W05 K_W07 K_W14 K_U02 K_K05	Cel 1 Cel 2 Cel 3 Cel 5	l6 l7 c1 c2 c3 c4 c5 c6 c7 c8 c9	N1 N4 N6	F1 F3 P1
EK3	K_W05 K_W07 K_K04	Cel 1 Cel 4 Cel 5	l1 l2 l3 l4 l5 l7 c1 c2 c3 c4 c5 c6 c7 c8 p1 p2 p3 p4 p5 p6	N2 N4 N5 N6	F1 F2 F3 P1
EK4	K_W05 K_W07 K_U10 K_K05	Cel 1 Cel 2 Cel 5	l3 l4 l5 c1 c2 c3 c4 c5 c6 c7 c8 p1 p2 p3 p4 p5 p6	N2 N3 N4 N5	F1 F2 F3 P1
EK5	K_W05 K_W07 K_U10 K_K05	Cel 1	c1 p1	N2 N3 N4 N6	F1 P1
EK6	K_W01 K_W05 K_W07 K_W14 K_U11	Cel 5	l1 l3 l4 l6 l7 c2 c3 c4 c5 c6 c7 c8 c9	N4 N5	F2 F3 P1
EK7	K_W07 K_W14	Cel 5 Cel 6	l1 l2 l5 l6 c9 p2 p3 p4	N1 N2 N3 N4 N5 N6	F1 F2 F3 P1
EK8	K_W14 K_U11	Cel 6	l6 c9	N5	F2 F3 P1

11 WYKAZ LITERATURY

LITERATURA PODSTAWOWA

[1] Neville A.M — *Properties of Concrete*, London, 1997, Longman

LITERATURA UZUPEŁNIAJĄCA

[1] Czasopismo — *Concrete Plant International*, -, 2013, admedia GmbH

[2] praca zbiorowa — *Si. Symp. Prefabrication in Europe*, Kraków, 2007, PK

LITERATURA DODATKOWA

[1] strony internetowe i katalogi wytwórców sprzętu i elementów prefabrykowanych

[2] XXV WPPK Szczyrk 2010

12 INFORMACJE O NAUCZYCIELACH AKADEMICKICH

OSOBA ODPOWIEDZIALNA ZA KARTĘ

dr inż. Maciej Urban (kontakt: maciej.urban@pk.edu.pl)

OSOBY PROWADZĄCE PRZEDMIOT

1 dr inż. Maciej Urban (kontakt: maurban@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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