

POLITECHNIKA KRAKOWSKA IM. TADEUSZA KOŚCIUSZKI

KARTA PRZEDMIOTU

obowiązuje studentów rozpoczynających studia w roku akademickim 2022/2023

Wydział Inżynierii Lądowej

Kierunek studiów: Budownictwo

Profil: Ogólnoakademicki

Forma studiów: stacjonarne

Kod kierunku: BUD

Stopień studiów: I

Specjalności: Bez specjalności - studia w języku angielskim

1 INFORMACJE O PRZEDMIOCIE

| | |
|---|----------------------------------|
| NAZWA PRZEDMIOTU | Projektowanie dróg samochodowych |
| NAZWA PRZEDMIOTU W JĘZYKU ANGIELSKIM | Road Design |
| KOD PRZEDMIOTU | WIL BUD oIS C38 22/23 |
| KATEGORIA PRZEDMIOTU | Przedmioty kierunkowe |
| LICZBA PUNKTÓW ECTS | 5.00 |
| SEMESTRY | 5 |

2 RODZAJ ZAJĘĆ, LICZBA GODZIN W PLANIE STUDIÓW

| SEMESTR | WYKŁAD | ĆWICZENIA AUDYTORYJNE | LABORATORIA | LABORATORIA KOMPUTERO- WE | PROJEKTY | SEMINARIUM |
|---------|--------|--------------------------|-------------|---------------------------------|----------|------------|
| 5 | 45 | 0 | 0 | 0 | 30 | 0 |

3 CELE PRZEDMIOTU

Cel 1 Transfer of knowledge in the basics of road geometric design with the design determinants

Cel 2 Preparation for designing of less complicated elements of road infrastructure

4 WYMAGANIA WSTĘPNE W ZAKRESIE WIEDZY, UMIEJĘTNOŚCI I INNYCH KOMPETENCJI

1 knowledge of infrastructure designing determinants resulting from transportation planning and land development principles

5 EFEKTY KSZTAŁCENIA

EK1 Wiedza knowledge of basic legal requirements and technical criteria for the geometric design of roads and intersections

EK2 Wiedza knowledge of designing techniques of roads and intersections

EK3 Umiejętności skills of using standards, guidelines and instructions in the design of road infrastructure

EK4 Umiejętności ability of independent analysis of determinants of geometric design and selection of appropriate solutions

EK5 Umiejętności ability to solve problems connected with roads drainage

EK6 Kompetencje społeczne ability to independently complement and extend knowledge in the field of road design

6 TREŚCI PROGRAMOWE

| PROJEKTY | | |
|----------|---|------------------|
| LP | TEMATYKA ZAJĘĆ OPIS SZCZEGÓŁOWY BLOKÓW TEMATYCZNYCH | LICZBA GODZIN |
| P1 | Conceptual design of road section in two variants with the choice of geometrical alignment and calculations necessary for their dimensioning. Selection of crosssection type. Detailed design solution for the selected element from the project - intersection, culvert, transition curve. Technical escription preparation including design determinants and justification of the solutions | 30 |

| WYKŁAD | | |
|--------|--|------------------|
| LP | TEMATYKA ZAJĘĆ OPIS SZCZEGÓŁOWY BLOKÓW TEMATYCZNYCH | LICZBA GODZIN |
| W1 | The classification of roads and streets with its formal and technical determinants, indicators describing the road network, basic road design parameters and their determination. | 3 |
| W2 | Designing determinants resulting from the mechanics of movement criteria, road safety, cost and environmental requirements. | 6 |
| W3 | Vertical and horizontal alignment roads - elements and the basic of design criteria. Detailed principles of design: straight, curves, transition curves, elements of vertical alignment, alignment coordination. Homogeneity assessment of geometric horizontal alignment. | 6 |
| W4 | Elements of cross-section roads and their imensioning, shaping the road ramps. | 3 |

| WYKŁAD | | |
|------------|--|------------------|
| LP | TEMATYKA ZAJĘĆ OPIS SZCZEGÓŁOWY BLOKÓW TEMATYCZNYCH | LICZBA GODZIN |
| W5 | Earthworks operations, calculation of earth-moving asses and designing of earth movements. | 3 |
| W6 | Classification of road intersections, the basic design requirements, criteria for selecting intersection type, the elements of specific solutions for channelized intersections. | 6 |
| W7 | Elements of road drainage - the types and usage objectives. Characteristics of rainfall and etermination of calculated water runoff for imensioning drainage road facilities. | 3 |
| W8 | Dimensioning of open channels. Water discharge, taking into account environmental considerations. Streets and squares drainage | 4 |
| W9 | Road culverts, designing and construction. | 2 |
| W10 | Subsoil drainage system, typical design solutions. | 2 |
| W11 | Parking and service roads to the buildings | 4 |
| W12 | Traffic organization and control measures. Traffic calming measures | 3 |

7 NARZĘDZIA DYDAKTYCZNE

N1 Lectures

N2 Project exercises

8 OBCIĄŻENIE PRACĄ STUDENTA

| FORMA AKTYWNOŚCI | ŚREDNIA LICZBA GODZIN NA ZREALIZOWANIE AKTYWNOŚCI |
|--|---|
| Godziny kontaktowe z nauczycielem akademickim, w tym: | |
| Godziny wynikające z planu studiów | 75 |
| Konsultacje przedmiotowe | 10 |
| Egzaminy i zaliczenia w sesji | 3 |
| Godziny bez udziału nauczyciela akademickiego wynikające z nakładu pracy studenta, w tym: | |
| Przygotowanie się do zajęć, w tym studiowanie zalecanej literatury | 30 |
| Opracowanie wyników | 0 |
| Przygotowanie raportu, projektu, prezentacji, dyskusji | 30 |
| SUMARYCZNA LICZBA GODZIN DLA PRZEDMIOTU WYNIKAJĄCA Z CAŁEGO NAKŁADU PRACY STUDENTA | 148 |
| SUMARYCZNA LICZBA PUNKTÓW ECTS DLA PRZEDMIOTU | 5.00 |

9 SPOSOBY OCENY

OCENA FORMUJĄCA

F1 Individual project

OCENA PODSUMOWUJĄCA

P1 Final exam

WARUNKI ZALICZENIA PRZEDMIOTU

W1 Mandatory participation in design classes, positive mark from final exam, pass project by checking the knowledge during the consultation and confirming the correctness of the project implementation by the supervisor

OCENA AKTYWNOŚCI BEZ UDZIAŁU NAUCZYCIELA

B1 Assessment of the discussion on individual project

KRYTERIA OCENY

| EFEKT KSZTAŁCENIA 1 | |
|---------------------|--|
| NA OCENĘ 2.0 | Student does not know the technical and functional classification of roads and objectives of its introduction, is not able to recognize the parameters of roads and intersections depending on: the mechanics of movement, road safety and environmental protection. |

| | |
|---------------------|---|
| NA OCENĘ 3.0 | Student knows sufficient the technical and functional classification of roads and objectives of its introduction, is able to recognize the parameters of roads and intersections depending on: the mechanics of movement, road safety and environmental protection. |
| NA OCENĘ 3.5 | Student knows quite well the technical and functional classification of roads and objectives of its introduction, is able to recognize the parameters of roads and intersections depending on: the mechanics of movement, road safety and environmental protection. |
| NA OCENĘ 4.0 | Student knows well the technical and functional classification of roads and objectives of its introduction, is able to recognize the parameters of roads and intersections depending on: the mechanics of movement, road safety and environmental protection. |
| NA OCENĘ 4.5 | Student knows over well the technical and functional classification of roads and objectives of its introduction, is able to recognize the parameters of roads and intersections depending on: the mechanics of movement, road safety and environmental protection. |
| NA OCENĘ 5.0 | Student knows very well the technical and functional classification of roads and objectives of its introduction, is able to recognize the parameters of roads and intersections depending on: the mechanics of movement, road safety and environmental protection. |
| EFEKT KSZTAŁCENIA 2 | |
| NA OCENĘ 2.0 | Student does not know the typical designs of road cross-sections, the general rules for selection of cross-section parameters, and also does not know what elements made up the route and road profile. Student is not also able to provide general principles of route and profile design. |
| NA OCENĘ 3.0 | Student knows sufficient the typical designs of road cross-sections, the general rules for selection of cross-section parameters, and also knows what elements made up the route and road profile. Student is also able to provide general principles of route and profile design. |
| NA OCENĘ 3.5 | Student knows quite well the typical designs of road cross-sections, the general rules for selection of cross-section parameters, and also knows what elements made up the route and road profile. Student is also able to provide general principles of route and profile design. |
| NA OCENĘ 4.0 | Student knows well the typical designs of road cross-sections, the general rules for selection of cross-section parameters, and also knows what elements made up the route and road profile. Student is also able to provide general principles of route and profile design. |
| NA OCENĘ 4.5 | Student knows over well the typical designs of road cross-sections, the general rules for selection of cross-section parameters, and also knows what elements made up the route and road profile. Student is also able to provide general principles of route and profile design. |

| | |
|---------------------|---|
| NA OCENĘ 5.0 | Student knows very well the typical designs of road cross-sections, the general rules for selection of cross-section parameters, and also knows what elements made up the route and road profile. Student is also able to provide general principles of route and profile design. |
| EFEKT KSZTAŁCENIA 3 | |
| NA OCENĘ 2.0 | Student is not able to demonstrate the ability to select proper parameters of the designed sections of roads and intersections with the application of technical and structural regulations. |
| NA OCENĘ 3.0 | Student demonstrates sufficiently the ability to select proper parameters of the designed sections of roads and intersections with the application of technical and structural regulations. |
| NA OCENĘ 3.5 | Student demonstrates quite well the ability to select proper parameters of the designed sections of roads and intersections with the application of technical and structural regulations. |
| NA OCENĘ 4.0 | Student demonstrates well the ability to select proper parameters of the designed sections of roads and intersections with the application of technical and structural regulations. |
| NA OCENĘ 4.5 | Student demonstrates over well the ability to select proper parameters of the designed sections of roads and intersections with the application of technical and structural regulations. |
| NA OCENĘ 5.0 | Student demonstrates very well the ability to select proper parameters of the designed sections of roads and intersections with the application of technical and structural regulations. |
| EFEKT KSZTAŁCENIA 4 | |
| NA OCENĘ 2.0 | Student is not able to formulate the assumptions and conditions of the designated project tasks and provide a procedure to deal with this task. Student is also able to identify connections between project task and technical and structural regulations. |
| NA OCENĘ 3.0 | Student is able to formulate sufficiently the assumptions and conditions of the designated project tasks and provide a procedure to deal with this task. Student is also able to identify connections between project task and technical and structural regulations. |
| NA OCENĘ 3.5 | Student is able to formulate quite well the assumptions and conditions of the designated project tasks and provide a procedure to deal with this task. Student is also able to identify connections between project task and technical and structural regulations. |
| NA OCENĘ 4.0 | Student is able to formulate well the assumptions and conditions of the designated project tasks and provide a procedure to deal with this task. Student is also able to identify connections between project task and technical and structural regulations. |

| | |
|---------------------|---|
| NA OCENĘ 4.5 | Student is able to formulate over well the assumptions and conditions of the designated project tasks and provide a procedure to deal with this task. Student is also able to identify connections between project task and technical and structural regulations. |
| NA OCENĘ 5.0 | Student is able to formulate very well the assumptions and conditions of the designated project tasks and provide a procedure to deal with this task. Student is also able to identify connections between project task and technical and structural regulations. |
| EFEKT KSZTAŁCENIA 5 | |
| NA OCENĘ 2.0 | The student is not able to provide the types of surface and subsoil drainage features along with their structure and knows the general rules for their selection. |
| NA OCENĘ 3.0 | The student is able to provide sufficiently the types of surface and subsoil drainage features along with their structure and knows the general rules for their selection. |
| NA OCENĘ 3.5 | The student is able to provide quite well the types of surface and subsoil drainage features along with their structure and knows the general rules for their selection. |
| NA OCENĘ 4.0 | The student is able to provide well the types of surface and subsoil drainage features along with their structure and knows the general rules for their selection. |
| NA OCENĘ 4.5 | The student is able to provide over well the types of surface and subsoil drainage features along with their structure and knows the general rules for their selection. |
| NA OCENĘ 5.0 | The student is able to provide very well the types of surface and subsoil drainage features along with their structure and knows the general rules for their selection. |
| EFEKT KSZTAŁCENIA 6 | |
| NA OCENĘ 2.0 | Student is not able to independently perform the design task, setting up the correct assumptions for the road design and presenting the solution fulfilling the basic requirements of technical and structural regulations. |
| NA OCENĘ 3.0 | Student is able to independently sufficiently perform the design task, setting up the correct assumptions for the road design and presenting the solution fulfilling the basic requirements of technical and structural regulations. |
| NA OCENĘ 3.5 | Student is able to independently quite well perform the design task, setting up the correct assumptions for the road design and presenting the solution fulfilling the basic requirements of technical and structural regulations. |
| NA OCENĘ 4.0 | Student is able to independently well perform the design task, setting up the correct assumptions for the road design and presenting the solution fulfilling the basic requirements of technical and structural regulations. |
| NA OCENĘ 4.5 | Student is able to independently over well perform the design task, setting up the correct assumptions for the road design and presenting the solution fulfilling the basic requirements of technical and structural regulations. |
| NA OCENĘ 5.0 | Student is able to independently very well perform the design task, setting up the correct assumptions for the road design and presenting the solution fulfilling the basic requirements of technical and structural regulations. |

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_W09 K_W10 K_W17 | Cel 1 | w1 w2 | N1 | P1 |
| EK2 | K_W06 K_W10 K_W17 | Cel 1 | p1 w3 w4 w5 w6 w7 w8 w9 w10 w11 w12 | N1 N2 | F1 P1 |
| EK3 | K_U08 K_U19 | Cel 2 | p1 | N2 | F1 |
| EK4 | K_U01 K_U17 K_U19 | Cel 2 | p1 w1 w2 w3 w4 w5 w6 w11 w12 | N1 N2 | F1 P1 |
| EK5 | K_U05 K_U19 | Cel 2 | p1 w7 w8 w9 w10 | N1 N2 | F1 P1 |
| EK6 | K_K03 K_K06 | Cel 1 Cel 2 | p1 | N2 | F1 P1 |

11 WYKAZ LITERATURY

LITERATURA PODSTAWOWA

- [1] **Garber N., Hoel L.** — *Traffic and Highway Engineering*, USA, 2001, Pacific Grove
- [2] **Schoon J.G** — *Geometric design projects for highways: An introduction*, USA, 2000, ASCE Press

LITERATURA UZUPEŁNIAJĄCA

- [1] **MTiGM** — *Warunki techniczne jakim powinny odpowiadać drogi publiczne i ich usytuowanie*, Warszawa, 2019, Dz.U. poz. 1643
- [2] **Transprojekt Warszawa** — *Komentarz do warunków technicznych jakim powinny odpowiadać drogi publiczne i ich usytuowanie*, Warszawa, 2002, GDDKiA/Transprojekt
- [3] **Edel R.** — *Odwodnienie dróg*, Warszawa, 2000, WKiŁ
- [4] **Gaca S., Tracz M., Suchorzewski W.** — *Inżynieria ruchu drogowego - teoria i praktyka*, Warszawa, 2008, WKiŁ
- [5] **Tracz M., Chodur J., Gaca S. i inni** — *Wytyczne projektowania skrzyżowań drogowych*, Warszawa, 2001, Generalna Dyrekcja Dróg Publicznych

[6] Krystek R. i inni — *Węzły drogowe i autostradowe*, Warszawa, 2008, WKŁ

LITERATURA DODATKOWA

[1] Highway Design Handbook, U.S. Department of Transportation Federal Highway Administration, 2001

[2] Transportation and traffic engineering Handbook, Institute of Transportation Engineers, Washington 1989

12 INFORMACJE O NAUCZYCIELACH AKADEMICKICH

OSOBA ODPOWIEDZIALNA ZA KARTĘ

dr inż. Mariusz Kieć (kontakt: mkiec@pk.edu.pl)

OSOBY PROWADZĄCE PRZEDMIOT

1 dr hab. inż. Mariusz Kieć (kontakt: mkiec@pk.edu.pl)

2 dr inż. Remigiusz Wojtal (kontakt: rwojtal@pk.edu.pl)

3 dr inż. Radosław Bąk (kontakt: rbak@pk.edu.pl)

13 ZATWIERDZENIE KARTY PRZEDMIOTU DO REALIZACJI

(miejsowość, data)

(odpowiedzialny za przedmiot)

(dziekan)

PRZYJMUJĘ DO REALIZACJI (data i podpisy osób prowadzących przedmiot)

.....
.....
.....