

# 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: I

Specjalności: Bez specjalności – studia w języku angielskim

### 1 INFORMACJE O PRZEDMIOCIE

NAZWA PRZEDMIOTU	Nawierzchnie drogowe i technologia robót drogowych
NAZWA PRZEDMIOTU W JĘZYKU ANGIELSKIM	Road Surfaces and Technology of Road Construction
KOD PRZEDMIOTU	WIL BUD oIS C30 21/22
KATEGORIA PRZEDMIOTU	Przedmioty kierunkowe
LICZBA PUNKTÓW ECTS	3.00
SEMESTRY	4

### 2 RODZAJ ZAJĘĆ, LICZBA GODZIN W PLANIE STUDIÓW

SEMESTR	WYKŁAD	ĆWICZENIA AUDYTORYJNE	LABORATORIA	LABORATORIA KOMPUTERO- WE	PROJEKTY	SEMINARIUM
4	30	0	15	0	15	0

### 3 CELE PRZEDMIOTU

**Cel 1** Introduction to basic terms and definitions, connected with the pavement structure and its collaboration with a subgrade, technical-exploitation parameters of pavements, ultimate limit states.

**Cel 2** Acquainting students with the road pavements classification criteria in relation to the traffic loading, structure type, deformability, materials; acquaintance with practical principles of pavement type selection.

**Cel 3** Acquainting students with the specificity of road materials and examination methods of their functional properties (according to European Standards), as well as with principles of their certification.

**Cel 4** Acquainting students with the mechanisms of pavement work structure work for flexible, rigid and semi rigid structures, and algorithms of their design.

**Cel 5** Acquainting students with assortments of road works and technologies of their execution.

**Cel 6** Students acquire the competences in the team-work.

## 4 WYMAGANIA WSTĘPNE W ZAKRESIE WIEDZY, UMIEJĘTNOŚCI I INNYCH KOMPETENCJI

1 The students credit for the course: Building Materials

## 5 EFEKTY KSZTAŁCENIA

**EK1 Wiedza** Student explains the principles of road pavement structure, the improving of pavement structure, ultimate limit states, as well as the demands made by managers and road users.

**EK2 Umiejętności** Student is able to select the proper pavement type in the relation to such criteria as: pavement function, traffic load, structure type, deformability, material possibilities, and so on.

**EK3 Wiedza** Student explains requirements for road materials depending on the specificity of their performance.

**EK4 Umiejętności** Student is able to apply the proper algorithm to pavement structure design.

**EK5 Wiedza** Student is able to specify the assortments of road works, to describe the technology of their execution and acceptance requirements.

**EK6 Kompetencje społeczne** Student cooperates with the team.

## 6 TREŚCI PROGRAMOWE

LABORATORIA		
LP	TEMATYKA ZAJĘĆ OPIS SZCZEGÓŁOWY BLOKÓW TEMATYCZNYCH	LICZBA GODZIN
L1	Tests for mineral aggregates properties: determination of particle size distribution, (with the evaluation of the aggregate usefulness to the mechanical stabilization technology), shape index test, sand equivalent test, resistance to fragmentation test, resistance to freezing and thawing test, affinity between aggregate and bitumen test.	4
L2	Tests for paving bitumen: needle penetration test, softening point Ring and Ball method test, Fraass breaking point test, elastic recovery of modified bitumen test.	2
L3	Tests for hot mix asphalt: composition design, preparation of specimens to tests, compactibility in gyratory press, water sensitivity in indirect tensile strength test, elastic stiffness modulus test with indirect tensile test and the 4-pointed bended beam, resistance to rutting test, resistance to fatigue test, interlayer binding test.	5
L4	Tests for hot mix asphalt: composition design, preparation of specimens to tests, compactibility in gyratory press, water sensitivity in indirect tensile strength test, elastic stiffness modulus test with indirect tensile test and the 4-pointed bended beam, resistance to rutting test, resistance to fatigue test, interlayer binding test.	4

PROJEKTY		
LP	TEMATYKA ZAJĘĆ OPIS SZCZEGÓŁOWY BLOKÓW TEMATYCZNYCH	LICZBA GODZIN
P1	Team design: designing of typical pavement structures for carriageways, bus stop lay-bys, car parks, cycle lanes, sidewalks with car-park admission. Whole work consists of the determination of traffic category, designing the subgrade improvement according to geological conditions, materials selection, calculation of layers thickness, checking the depth of the frost penetration, specifying the standard requirements for structure layers.	15

WYKŁAD		
LP	TEMATYKA ZAJĘĆ OPIS SZCZEGÓŁOWY BLOKÓW TEMATYCZNYCH	LICZBA GODZIN
W1	Introduction to basic terms and definitions, connected with the pavement structure and its co-work with a subgrade, road pavement as the engineering structure, technical- exploitation parameters of pavements, (bearing capacity, friction, evenness, rutting, instability, durability, light reflection, noise emission, impermeability of surface layers, requirements for road markings), ultimate limit states.	5
W2	Classification of pavements according to different criteria: level of the accommodation to fast traffic, traffic loads, deformability, applied materials, influence of the temperature on the pavement work, criteria of the pavement type selection.	2
W3	Stone pavement materials: raw materials for stone elements and road aggregates production, their basic physical and mechanical properties, testing and evaluation methods, chosen examples of their application, among others also to stone pavements in historical areas.	3
W4	Road artificial aggregates, reclaimed asphalt and fillers: types, properties and requirements.	1
W5	Asphalt binders, paving grade bitumen, polymer modified bitumen, bitumen emulsions, cut back bitumen, bitumen production, applications, properties and requirements.	3
W6	Bituminous mixtures: types, applications, composition design, properties and requirements. Conventional mixtures and new generation mixtures.	3
W7	Pavement structure design, soil subgrade classification, weak subgrades improving methods with using the geotextiles, the pavement structure work mechanism, execution requirements, the algorithm of pavement structure design for flexible and semirigid pavements.	5
W8	Technology of the road works: assortments of road works, earth works with the use of the materials for embankments, subgrade strengthening methods, mineral unbound aggregate bases, aggregate bases bound with the hydraulic binders, pavement recycling technology, technology of surface asphalt layers, specifications for the execution and acceptance inspection of the road works.	8