Politechnika Krakowska im. Tadeusza Kościuszki

Karta przedmiotu

obowiązuje studentów rozpoczynających studia w roku akademickim 2012/2013

Wydział Inżynierii Lądowej

Kierunek studiów: Budownictwo

Profil: Ogólnoakademicki

Forma sudiów: stacjonarne

Kod kierunku: BUD

Stopień studiów: I

Specjalności: Bez specjalności - studia w języku angielskim

1 Informacje o przedmiocie

Nazwa przedmiotu	Budownictwo wodne
Nazwa przedmiotu w języku angielskim	Hydraulic Engineering
Kod przedmiotu	WIL BUD oIS D37 12/13
Kategoria przedmiotu	Przedmioty specjalnościowe
Liczba punktów ECTS	2.00
Semestry	6

2 Rodzaj zajęć, liczba godzin w planie studiów

Semestr	Wykład	Ćwiczenia audytoryjne	Laboratoria	Laboratoria komputerowe	Projekty	Seminarium
6	30	0	0	0	15	0

3 Cele przedmiotu

Cel 1 To introduce the fundamentals concepts and problems of hydraulic engineering and to familiarize students with practical applications of hydraulic engineering.

Cel 2 To provide students with exposure to the basic calculations methods for solving typical and simple engineering problems in hydraulic engineering

4 Wymagania wstępne w zakresie wiedzy, umiejętności i innych kompetencji

1 The Hydraulics Engineering course is designed for students who have little or no previous knowledge of the field

2 All the terms used are defined or explained throughout the courses, so students are not required to have a hydraulics vocabulary to understand the content

5 Efekty kształcenia

EK1 Wiedza A knowledge of the fundamentals concepts of hydraulic engineering

EK2 Wiedza A knowledge of contemporary issues of hydraulic engineering and relations between hydraulic engineering and other field of civil engineering

EK3 Umiejętności An ability to identify, formulate and solve simple hydraulic engineering problems

EK4 Umiejętności An ability to design a simple conception of small dam

6 Treści programowe

Projekty		
Lp	Tematyka zajęć Opis szczegółowy bloków tematycznych	Liczba godzin
P1	Calculation of river bed equilibrium including calculation of river bed discharge curve and sediment transport parameters.	4
P2	Conception of small dam including: calculation of characteristic and designing flood flows, calculation of spillway and discharge basin hydraulic parameters, calculation of seepage velocity below the hydraulic works.	8
P3	Calculation of wells parameters and discharge.	3

Wykład		
Lp	Tematyka zajęć Opis szczegółowy bloków tematycznych	Liczba godzin
W1	Fundamental concepts and major areas of interest of hydraulic engineering. Aims and types of hydraulic works and structures. History and evolution of hydraulic engineering.	2
W2	River training principles. Types, functions, conditions of the location and basic elements of river training constructions. Interactions between the river and civil engineering structures. River bed equilibrium. Basic concepts and calculation rules of solid transport. Restoration of the rivers and streams.	4
W3	Flood protection. Major flood threats. Typical flood protection solutions and modern concepts of flood risk reduction. Dynamic slow-down of water in the catchment. Urban surface an natural catchment run off control.	6

Wykład		
Lp	Tematyka zajęć Opis szczegółowy bloków tematycznych	Liczba godzin
W4	Seepage and erosion processes. Fundamental concepts. Characteristic parameters of seepage and erosion processes in the earth hydraulic structure. Methods of protection.	2
W5	Flood protection dikes (levees). Conditions of the location, types, basis elements. Examples of existing systems of flood protection dikes. Typical damages of dikes. Dikes monitoring methods.	4
W6	Concrete and earth dams. Conditions of location, types and basic elements of dams. Water retention. Characteristic parameters of the water reservoirs. Monitoring methods. Hydraulic works classification criteria.	4
W7	Flood gates, bottom outlets, spillways, discharge basin, Conditions of the location, types, basis elements and calculation methods.	2
W8	Water wells, and water intakes, basis concepts, calculation methods.	2
W9	Pumping station, types, basis elements, calculation methods.	2
W10	Water power stations. Daily energy requirements, water power stations types, water turbine, generators, power of water power station. Calculation methods.	2

7 Narzędzia dydaktyczne

N1 Wykłady

N2 Ćwiczenia projektowe

N3 Prezentacje multimedialne

N4 Dyskusja

N5 Konsultacje

8 Obciążenie pracą studenta

Forma aktywności	Średnia liczba godzin na zrealizowanie aktywności
Godziny kontaktowe z nauczycielem akademickim, w tym:	
Godziny wynikające z planu studiów	0
Konsultacje przedmiotowe	4
Egzaminy i zaliczenia w sesji	2
Godziny bez udziału nauczyciela akademickiego wynikające z nakładu pracy studenta, w tym:	
Przygotowanie się do zajęć, w tym studiowanie zalecanej literatury	2
Opracowanie wyników	7
Przygotowanie raportu, projektu, prezentacji, dyskusji	0
Sumaryczna liczba godzin dla przedmiotu wynikająca z całego nakładu pracy studenta	**15**
Sumaryczna liczba punktów ECTS dla przedmiotu	2.00

9 Sposoby oceny

Ocena formująca

F1 Projekt indywidualny

Ocena podsumowująca

P1 Egzamin pisemny

Kryteria oceny

Efekt kształcenia 1	
Na ocenę 3.0	Student is able to answer on two of the four questions concerning the fundamentals concepts of hydraulic engineering presented at the hydraulic engineering course.
Na ocenę 3.5	Student is able to answer on two and a half questions of the four questions concerning the fundamentals concepts of hydraulic engineering presented at the hydraulic engineering course
Na ocenę 4.0	Student is able to answer on three of the four questions concerning the fundamentals concepts of hydraulic engineering presented at the hydraulic engineering course.

Na ocenę 4.5	Student is able to answer on three and a half questions of the four questions concerning the fundamentals concepts of hydraulic engineering presented at the hydraulic engineering course.
Na ocenę 5.0	Student is able to answer on four of the four questions concerning the fundamentals concepts of hydraulic engineering presented at the hydraulic engineering course
Efekt kształcenia 2	
Na ocenę 3.0	Student is able to answer on two of the four questions concerning the contemporary issues of hydraulic engineering and relations between hydraulic engineering and other field of civil engineering of hydraulic engineering presented at the hydraulic engineering course.
Na ocenę 3.5	Student is able to answer on two and a half questions of the four questions concerning the contemporary issues of hydraulic engineering and relations between hydraulic engineering and other field of civil engineering of hydraulic engineering presented at the hydraulic engineering course.
Na ocenę 4.0	Student is able to answer on three of the four questions concerning the contemporary issues of hydraulic engineering and relations between hydraulic engineering and other field of civil engineering of hydraulic engineering presented at the hydraulic engineering course.
Na ocenę 4.5	Student is able to answer on three and a half questions of the four questions concerning the contemporary issues of hydraulic engineering and relations between hydraulic engineering and other field of civil engineering of hydraulic engineering presented at the hydraulic engineering course.
Na ocenę 5.0	Student is able to answer on four of the four questions concerning the contemporary issues of hydraulic engineering and relations between hydraulic engineering and other field of civil engineering of hydraulic engineering presented at the hydraulic engineering course.
Efekt kształcenia 3	
Na ocenę 3.0	Student is able to calculate a river bed discharge curve.
Na ocenę 3.5	Student is able to calculate a river bed discharge curve and a simple case of the wells parameters.
Na ocenę 4.0	Student is able to calculate a river bed discharge curve and simples cases of the wells parameters and of the runoff water problem in urban surface.
Na ocenę 4.5	Student is able to calculate a river bed discharge curve and simples cases of the wells parameters, of the runoff water problem in urban surface and of the sediment transport parameters in the river bed.
Na ocenę 5.0	Student is able to calculate a river bed discharge curve and simples cases of the wells parameters, of the runoff water problem in urban surface and of the sediment transport parameters in the river bed. Student is able also to propose a solution of river bed protection methods linked with the values of the sediment transport parameters in the river.
Efekt kształcenia 4	

Na ocenę 3.0	Student is able to propose a correct location of the dam in the catchment
Na ocenę 3.5	Student is able to propose a correct location of the dam in the catchment and a correct locations of the bottom outlet and the spillways in the axe of the dam.
Na ocenę 4.0	Student is able to propose a correct location of the dam in the catchment and a correct locations of the bottom outlet and the spillways in the axe of the dam. Student is able to calculate the spillway parameters related to design water flow.
Na ocenę 4.5	Student is able to propose a correct location of the dam in the catchment and a correct locations of the bottom outlet and the spillways in the axe of the dam. Student is able to calculate the spillway and dissipation basin parameters related to design water flow.
Na ocenę 5.0	Student is able to propose a correct location of the dam in the catchment and a correct locations of the bottom outlet and the spillways in the axe of the dam. Student is able to calculate the spillway and dissipation basin parameters related to design water flow and value of seepage velocity in the foundation of the dam

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_W06, K_W17, K_U01, K_U02, K_U19, K_K03	Cel 1	w1 w2 w3 w4 w5 w6 w7 w8 w9 w10	N1 N3 N4	P1
EK2	K_W17, K_U02, K_U19	Cel 1	w1 w2 w3 w4 w5 w6 w7 w8 w9 w10	N1 N3 N4	P1
EK3	K_W06, K_U01, K_U02, K_U19, K_K01, K_K02, K_K03, K_K10	Cel 2	p1 p2 p3	N2 N5	F1
EK4	K_W06, K_U01, K_U02, K_U19, K_K01, K_K03, K_K10	Cel 2	p2	N2 N5	F1

11 Wykaz literatury

Literatura podstawowa

[1] Mays — *Hydraulic design*, Arizona, 1999, The McGraw-Hill

12 Informacje o nauczycielach akademickich

Osoba odpowiedzialna za kartę

dr inż. Krzysztof Radzicki (kontakt: krzysztof.radzicki@iigw.pl)

Osoby prowadzące przedmiot

1 dr inż. Krzysztof Radzicki (kontakt: krzysztof.radzicki@iigw.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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