

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: II

Specjalności: Budowle - informacja i modelowanie (BIM)

1 INFORMACJE O PRZEDMIOCIE

| | |
|-----------------------------------------|--------------------------------|
| NAZWA PRZEDMIOTU | Management of BIM Systems |
| NAZWA PRZEDMIOTU W JĘZYKU ANGIELSKIM | |
| KOD PRZEDMIOTU | WIL BUD oIIS E1 22/23 |
| KATEGORIA PRZEDMIOTU | Przedmioty związane z dyplomem |
| LICZBA PUNKTÓW ECTS | 2.00 |
| SEMESTRY | 3 |

2 RODZAJ ZAJĘĆ, LICZBA GODZIN W PLANIE STUDIÓW

| SEMESTR | WYKŁAD | ĆWICZENIA AUDYTORYJNE | LABORATORIA | LABORATORIA KOMPUTERO- WE | PROJEKTY | SEMINARIUM |
|---------|--------|--------------------------|-------------|---------------------------------|----------|------------|
| 3 | 15 | 0 | 0 | 15 | 0 | 0 |

3 CELE PRZEDMIOTU

Cel 1 Introduction to basic BIM management concepts and basic norm and standards for BIM management like the BS1192 and ISO 19650 series of norms

Cel 2 Making students aware of basic methodologies and principles of managed BIM level 2 processes in engineering practice

Cel 3 Introduction to basic BIM level2 process documents: EIR, BEP, MIDP, TIDP, MPDT and other

Cel 4 A practical exposure of students to collaborative BIM environments, tools and best practices of collaborative work

Cel 5 A practical exposure to coordination and collision detection processes. Development of basic skillsets for BIM Coordinator and BIM manager roles/functions in project

4 WYMAGANIA WSTĘPNE W ZAKRESIE WIEDZY, UMIEJĘTNOŚCI I INNYCH KOMPETENCJI

1 A previous exposure to Introduction to BIM course

2 Practical computer literacy (MS Windows)

3 CAD and BIM software literacy in single-user environments

5 EFEKTY KSZTAŁCENIA

EK1 Wiedza Knowledge of fundamental BIM norms, standards and manuals defining collaborative BIM processes on interdisciplinary level. Knowledge of techniques, formats and processes of information-rich BIM models in multidisciplinary design and construction environments

EK2 Wiedza Fundamental knowledge of project governance and BIM management toolsets and skillsets. Introduction to defining and managing BIM information processes with BEP, EIR, MPDT, MIDP, TIDP etc. "Best practice BIM" approach.

EK3 Wiedza Knowledge of principles and tools for BIM coordination and collision detection. Quality of information in BIM models. Coordination models and coordination best practices. Shared coordinates.

EK4 Umiejętności Development of practical skills in collaborative working in BIM. Basic tools, procedures and processes for coordinated teamwork in BIM design teams.

EK5 Umiejętności Development of basic skills for BIM model coordination and collision detection.

EK6 Kompetencje społeczne Development of soft skills and competences for teamwork in BIM environments. Development of new, "collaborative personality", development of model-centric and team-centric mindset.

EK7 Kompetencje społeczne Development of basic competences and profiling of BIM manager and BIM coordinator roles.

6 TREŚCI PROGRAMOWE

| WYKŁAD | | |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| LP | TEMATYKA ZAJĘĆ OPIS SZCZEGÓŁOWY BLOKÓW TEMATYCZNYCH | LICZBA GODZIN |
| W1 | BIM as managed business process. BIM maturity taxonomy according to BSIs B/555 Committee and ISO 19650 standard. BIM process implementation on select international markets (GB, USA, Singapore, Finland, ...). BIM guides and BIM manuals on national levels. | 2 |
| W2 | BIM level 2 processes according to BS 1192 family of standards. A detailed discussion of BIM management on level 2, Standard Method and Procedure, Roles&Responsibilities, Common Data Environment. Project governance according to PAS 1192-2:2013 specification. | 2 |

| WYKŁAD | | |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| LP | TEMATYKA ZAJĘĆ OPIS SZCZEGÓŁOWY BLOKÓW TEMATYCZNYCH | LICZBA GODZIN |
| W3 | BIM processes according ISO 19650 family of standards, differences and amendments to BS 1192. A detailed discussion of BIM new roles, documents and project management principles. The role of BIM Manager. | 2 |
| W4 | Container based BIM collaboration. Common Data Environment (CDE) as center for all data/information processes. CDE states/zones: WIP., Shared, Published, Archive. Information quality and information management principles and responsibilities. The role of Information Manager, BIM information protocol. | 2 |
| W5 | BIM and CAD standards in BIM projects. Naming conventions, version management, suitability codes according to BS 1192:2007 and PAS 1192-2. Specifications for EIR, BEP, MPDT, MIDP, TIDP. | 2 |
| W6 | BIM coordination. Coordination models, information quality approvals on passages through CDE zones. Best BIM coordination practices. Collision taxonomy and collision resolution procedures. The role of the BIM Coordinator. | 2 |
| W7 | OpenBIM data file formats and standard. Open information exchange in BIM projects. BIM implementation to organizations strategy according to PennState BIM Guide for Owners. | 2 |
| W8 | Course resume and the test. 1 | 1 |

| LABORATORIA KOMPUTEROWE | | |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| LP | TEMATYKA ZAJĘĆ OPIS SZCZEGÓŁOWY BLOKÓW TEMATYCZNYCH | LICZBA GODZIN |
| K1 | Team work in Revit worksharing mode over LAN - configuration and basic principles. Worksets, central model, local models, model detachment. Managing Revit collaborative environments. | 2 |
| K2 | Tools for teamwork coordination in Revit: CAD and BIM model linking, link management. Simple spatial coordination of BIM models. | 2 |
| K3 | Tools for teamwork coordination in Revit II: Copy-Monitor in linked models, change management. Coordination review in Revit and collision detection. | 2 |
| K4 | Shared coordinates in BIM model. Georeferenced terrain models, true north vs. project north. Georeferenced coordination models. | 2 |
| K5 | Model reviewing, commenting and redlining. Revit support for internal revision management and control. External tools for redlining and commenting. DWF markups exchange format and Design Review software tools to support team-based review and commenting processes. | 2 |

| LABORATORIA KOMPUTEROWE | | |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| LP | TEMATYKA ZAJĘĆ OPIS SZCZEGÓŁOWY BLOKÓW TEMATYCZNYCH | LICZBA GODZIN |
| K6 | Introduction to Navisworks - basic concepts. Navisworks GUI and model navigation tools. Federating BIM and CAD models, models management within the Navisworks environment. Selection sets, search sets, models and modelscomponent visibility states. Saved view management, commenting through NW dedicated file formats (NWD, NFW), model verisfication, markups, meassurements. Model sectioning. | 2 |
| K7 | Collision detection in Navisworks, collision management. Setup of Collicion Detective parameters, Collision Detective workflows and procedures. Collision resolution assignment and verification. | 2 |
| K8 | Test | 1 |

7 NARZĘDZIA DYDAKTYCZNE

N1 Wykłady

N2 Ćwiczenia laboratoryjne

N3 Praca w grupach

N4 Prezentacje multimedialne

N5 Dyskusja

N6 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 | 30 |
| Konsultacje przedmiotowe | 5 |
| Egzaminy i zaliczenia w sesji | 0 |
| Godziny bez udziału nauczyciela akademickiego wynikające z nakładu pracy studenta, w tym: | |
| Przygotowanie się do zajęć, w tym studiowanie zalecanej literatury | 10 |
| Opracowanie wyników | 0 |
| Przygotowanie raportu, projektu, prezentacji, dyskusji | 5 |
| SUMARYCZNA LICZBA GODZIN DLA PRZEDMIOTU WYNIKAJĄCA Z CAŁEGO NAKŁADU PRACY STUDENTA | 50 |
| SUMARYCZNA LICZBA PUNKTÓW ECTS DLA PRZEDMIOTU | 2.00 |

9 SPOSOBY OCENY

OCENA FORMUJĄCA

F1 Test

F2 Projekt indywidualny

F3 Projekt zespołowy

OCENA PODSUMOWUJĄCA

P1 Średnia ważona ocen formujących

WARUNKI ZALICZENIA PRZEDMIOTU

W1 Positive grading of all projects and tests

KRYTERIA OCENY

| EFEKT KSZTAŁCENIA 1 | |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NA OCENĘ 3.0 | Lists the basic standards that define BIM information processes such as ISO 19650 and BS1192 and knows the basic principles of BIM information processes level 2. Knows the basic ways of exchanging BIM information and basic BIM data formats |
| EFEKT KSZTAŁCENIA 2 | |

| | |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NA OCENĘ 3.0 | Understands that BIM is a managed business process and that the management layer is very important in BIM. Knows the basic principles of BIM management processes, including the types of documents that define the BIM level 2 information process |
| EFEKT KSZTAŁCENIA 3 | |
| NA OCENĘ 3.0 | Knows the basic principles and concepts related to interdisciplinary coordination, tools and coordination platforms. Student can setup the basic parameters of teh coordination tools and coordination rules. |
| EFEKT KSZTAŁCENIA 4 | |
| NA OCENĘ 3.0 | Can work as a team member in worksharing mode in Revit, understands the basic principles of collaborative work, distinguishes between local and central files, knows how update the central file. Knows the basic mechanisms of worksharing mode, can create and select actual worksets for teamwork, relinquish them them to the workset pool. |
| EFEKT KSZTAŁCENIA 5 | |
| NA OCENĘ 3.0 | Is able to use software for basic purposes interdisciplinary coordination, federate simple models with a proper arrangement in a common coordinate syste, conduct collision analysis in typical scenarios and manage the collision resolution procedures |
| EFEKT KSZTAŁCENIA 6 | |
| NA OCENĘ 3.0 | He can duplicate the known scenarios of teamwork, configure environment for sharing models, manage simple BIM standards, assign basic permissions and set basic collaboration rules. Can prepare BIM documents such as EIR or BEP for a typical, non-complicated project |
| EFEKT KSZTAŁCENIA 7 | |
| NA OCENĘ 3.0 | Can coordiante teamwork of a small team, assign tasks and responsibilities, set rules and standards, control performance and quality of information models |

10 MACIERZ REALIZACJI PRZEDMIOTU

| EFEKT KSZTAŁCENIA | ODNIESIENIE DANEGO EFEKTU DO SZCZEGÓLOWYCH EFEKTÓW ZDEFINIOWANYCH DLA PROGRAMU | CELE PRZEDMIOTU | TREŚCI PROGRAMOWE | NARZĘDZIA DYDAKTYCZNE | SPOSOBY OCENY |
|-------------------|--------------------------------------------------------------------------------|----------------------|----------------------|-----------------------|---------------|
| EK1 | | Cel 1 Cel 2 Cel 4 | w1 w2 w3 k5 k6 k7 | N1 N2 N3 N4 | F1 F2 F3 P1 |
| EK2 | | Cel 2 Cel 3 | w1 w2 w3 | N1 N4 N5 N6 | F1 P1 |

| EFEKT KSZTAŁCENIA | ODNIESIENIE DANEGO EFEKTU DO SZCZEGÓŁOWYCH EFEKTÓW ZDEFINIOWANYCH DLA PROGRAMU | CELE PRZEDMIOTU | TREŚCI PROGRAMOWE | NARZĘDZIA DYDAKTYCZNE | SPOSOBY OCENY |
|-------------------|--------------------------------------------------------------------------------|----------------------|----------------------------------------|-----------------------|---------------|
| EK3 | | Cel 2 Cel 4 Cel 5 | w6 w7 k2 k3 k6 k7 | N1 N2 N3 N4 N5 N6 | F1 F2 F3 P1 |
| EK4 | | Cel 2 Cel 4 | w2 w3 w4 w5 w6 w7 k1 k2 k3 k5 k7 | N1 N2 N3 N4 N5 N6 | F1 F2 F3 P1 |
| EK5 | | Cel 1 Cel 4 Cel 5 | w4 w6 w7 w8 k2 k3 k6 k7 k8 | N1 N2 N3 N4 N5 N6 | F1 F2 F3 P1 |
| EK6 | | Cel 1 Cel 2 Cel 4 | w1 w2 w3 w4 w8 k1 k3 k5 k6 k7 k8 | N1 N2 N3 N4 N5 N6 | F1 F2 F3 P1 |
| EK7 | | Cel 1 Cel 2 Cel 4 | w1 w3 w6 w7 w8 k1 k5 k6 | N1 N2 N3 N4 N5 N6 | F1 F2 F3 P1 |

11 WYKAZ LITERATURY

LITERATURA PODSTAWOWA

- [1] | **Dominik Holzer** — *The BIM Managers Handbook: Guidance for Professionals in Architecture, Engineering, and Construction*, Miejscość, 2015, Wiley & Sons, Inc.
- [2] | **Kumar B** — *A Practical Guide to Adopting BIM in Construction Projects*, Miejscość, 2015, Whittles Publishing
- [3] | **S. Mordue, P. Swaddle, D. Philip** — *TytułBuilding Information Modeling For Dummies*, Miejscość, 2016, Wiley & Sons, Inc.
- [4] | **Stine D.J.** — *Design Integration using Autodesk Revit 2017. Architecture, Structure and MEP*, Miejscość, 2017, SDC
- [5] | **Richards M.** — *Building Information Management, A Standard Framework and Guide to BS 1192*, Londyn, 2010, BSI
- [6] | **Shepherd D.** — *BIM Management Handbook*, Newcastle, 2015, NBS
- [7] | **Kasznia D., Magiera J., Wierzowiecki P.** — *BIM w praktyce. Standardy, wdrożenie, casestudy*, Warszawa, 2018, PWN

LITERATURA UZUPEŁNIAJĄCA

- [1] | **Crotty R.** — *The Impact of Building Information Modelling: Transforming Construction*, Londyn, 2012, SPON Press
- [2] | **Praca zespołowa** — *The BIM Planning Guide for Facility Owners*, Pittsburgh, 2012, PennState Univ. Press
- [3] | **Tomana A.** — *BIM. Innowacyjna technologia w budownictwie*, Kraków, 2015, Builder

12 INFORMACJE O NAUCZYCIELACH AKADEMICKICH

OSOBA ODPOWIEDZIALNA ZA KARTĘ

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OSOBY PROWADZĄCE PRZEDMIOT

1 dr inż. Jacek Magiera (kontakt: jacek.magiera@pk.edu.pl)

2 dr hab. inż Marek Słonski (kontakt: mslonski@15.pk.edu.pl)

13 ZATWIERDZENIE KARTY PRZEDMIOTU DO REALIZACJI

(miejsowość, data)

(odpowiedzialny za przedmiot)

(dziekan)

PRZYJMUJĘ DO REALIZACJI (data i podpisy osób prowadzących przedmiot)

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