

Priloga 1 k Vlogi za akreditacijo krajšega izobraževanja in usposabljanja za pridobitev mikrodokazila – Učni načrt mikrodokazila
Enclosure 1 to the application for accreditation of short-term learning and training course
for the acquisition of micro-credentials – Micro-credential Syllabus

UČNI NAČRT MIKRODOKAZILA/MICRO-CREDENTIAL SYLLABUS

Naziv mikrodokazila:

Micro-credential title:

Informacijska tehnologija za trajnostno oblikovanje - BIM z elementi algoritmike
Information Technology for Sustainable Design - BIM with Elements of Algorithmics

Študijsko področje po KLASIUS P-16

Study field according to KLASIUS P-16:

073

Razvrstitev v SOK: SQF Classification in

Razvrstitev v EOVK: QF-EHEA Classification

Razvrstitev v EOK: EQF Classification

7

1 stopnja

6

Univerzitetna koda/University code:

Način izvedbe (klasično, hibridno, na daljavo)

Method of implementation (classic, hybrid, online)

klasično, na daljavo

classic, online

Predavanja <i>Lectures</i>	Seminar <i>Seminar</i>	Vaje <i>Tutorial</i>	Klinične vaje <i>Clinical work</i>	Druge oblike študija <i>Other forms of study</i>	Samostojno delo <i>Individual work</i>	ECTS
15		15			60	3

Nosilec predmeta/Lecturer:

(So)izvajalci/(Co)-Lecturers:

Prof. Dr. Andreja Kutnar

Prof. Dr. Anetta Kepczynska-Walczak

Jezik izvedbe

Language of instruction

Angleščina

English

Maksimalno število udeležencev

Maximum number of participants:

15

Merila za izbor udeležencev v primeru večjega interesa od razpisanih mest:

Criteria for selecting participants in the event of greater interest than the number of places available:

Datum prijave

Date of application

Pogoji za vključitev:

Študenti arhitekture in arhitekturnega inženirstva

Načela arhitekturnega načrtovanja
Osnove konstrukcijskega načrtovanja
Načela gradbenih predpisov
Računalniške veščine: računalniško podprto 2D risanje, osnovno 3D modeliranje, osnovni BIM

Prerequisites:

Students of Architecture and Architecture Engineering

Architectural design principles
Structural design foundations
Building regulations principles
Computer skills: computer aided 2D drafting, basic 3D modelling, elementary BIM.

Vsebina:

1. Modul 1 (e-učenje):

- a. Koncept in potek dela z informacijskim modeliranjem stavb (BIM);
- b. Uvod v koncept algoritmov v povezavi z BIM procesi;
- c. Raziskovanje simulacijskih orodij za načrtovanje nizkoenergijskih stavb v BIM okolju.

2. Modul 2 (laboratorij):

- a. Načrtovanje elementov informacijskih modelov arhitekturnih objektov v BIM programski opremi;

Content (Syllabus outline):

1. Module 1 (e-learning):

- a. The concept and workflow of the building information modeling (BIM);
- b. Introduction to the concept of algorithmics in relation to BIM processes;
- c. Exploring simulation tools for low-energy buildings design in BIM.

2. Module 2 (laboratory):

- a. Designing elements of information models of architectural objects in BIM software;
- b. Building elements interactive schedules;

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b. Interaktivni časovni načrti gradbenih elementov; c. Analitični podatki, analiza sončne osvetlitve, učinkovitost stavbe. 3. Modul 3 (končna naloga): a. Izdelava informacijskega modela nizkoenergijskega arhitekturnega objekta srednje zahtevnosti v BIM programski opremi; b. Predstavitev načrtovalskih rešitev z uporabo BIM orodij; c. Vrednotenje končnih rezultatov v kontekstu trajnostnega načrtovanja.	c. Analytical data, sun-study analysis, building performance. 3. Module 3 (final task): a. Building an information model of a low-energy architectural object on the intermediate complexity level in BIM software; b. Presenting design solutions using BIM tools; c. Evaluation of the final results in the context of sustainable design.
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Literatura in viri/Readings:

1. C. Eastman, P. Teicholz, R. Sacks, K. Liston: BIM handbook: a guide to building information modeling for owners, managers, designers, engineers and contractors. John Wiley & Sons, 2011 (626p)
2. <https://graphisoft.com/>
3. <https://www.decarbonizedesign.com/>
4. A. Sandak, J. Sandak, M. Brzezicki, A. Kutnar: Bio-based Building Skin, Springer Open, 2019 (193p)
5. Ch. Panteli, A. Kylili, P.A. Fokaides: Building information modelling applications in smart buildings: From design to commissioning and beyond: A critical review, Journal of Cleaner Production 265 (2020) 121766, Elsevier (13p)

Druge pomembne sestavine (npr. licence, orodja, pripomočki ipd.):

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Other important components (e.g. licenses, tools, utilities, etc.):

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Cilji in kompetence:

Sposobnost razlage koncepta in poteka dela procesa informacijskega modeliranja stavb (BIM).
Kompetence za uporabo BIM pri trajnostnem načrtovanju in nizkoenergijskih rešitvah.
Veščine ustvarjanja digitalnih informacijskih modelov arhitekturnih objektov srednje zahtevnosti v BIM programski opremi.
Sposobnost razvoja ustreznih BIM modelov ter kritičnega vrednotenja njihove učinkovitosti za sektor ACE (arhitektura, gradbeništvo in inženirstvo).
Praktične veščine uporabe tehnik, usmerjenih v BIM, v realnih scenarijih v arhitekturi in gradbeni industriji.

Objectives and competences:

Ability to explain the concept and workflow of the building information modeling (BIM) process.
Competence in using BIM for sustainable design and low-energy solutions.
Skills in creating digital information models of architectural objects on intermediate complexity level in BIM software.
Ability to develop appropriate BIM models, and critically evaluate their performance for the ACE (Architecture, Construction and Engineering) sector.
Practical skills in applying BIM-oriented techniques to real-world scenarios in architecture and construction industry.

Predvideni učni izidi:

Znanje in razumevanje:
Poznavanje procesa informacijskega modeliranja stavb (BIM).

Uporaba in refleksija:
Spoznavanje in razumevanje BIM procesa, uglasenosti med teorijo in njeno aplikacijo na konkretnih primerih. Avtonomnost, (samo)kritičnost, (samo)refleksivnost.
Prenos naučenih principov na načrtovanje obsežnih realnih sistemov. Sposobnost pridobivanja, selekcije in ocenjevanje novih informacij in zmnožnost ustrezne interpretacije v kontekstu.
Sposobnost za upravljanje s časom, za samo pripravo in načrtovanje ter samokontrolo izvajanja postopkov. Sposobnost timskega dela.

Intended learning outcomes:

Knowledge and understanding:
Expertise in building information modeling (BIM) process.

Use and reflection:
Understanding and recognizing the BIM process, the harmony between theory and its application to concrete examples. Autonomy, (self)criticism, (self-reflection).
Transfer of learned principles to the design of large-scale real systems. Ability to acquire, select, and evaluate new information and the capacity for appropriate interpretation in context.
Ability to manage time, self-preparation and planning, and self-monitoring of process execution. The ability to work in a team.

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Metode učenja in poučevanja

Oblike dela: • predavanja • vaje • samostojno delo Metode dela: razlaga, dialog, diskusija, problemsko učenje, študije primerov
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Learning and teaching methods:

Forms of teaching: • lectures • exercises • individual work Teaching methods: explanation, debates, discussion, problem-based learning, case studies

Način preverjanja in ocenjevanja:

Type of examination and assessment:

Način (pisni izpit, ustni izpit, naloge, idr.)	Delež (v %): <i>Weight (in %)</i>	<i>Type (written exam, oral exam, assignments, etc.)</i>
Projektna naloga	100%	Project assignment

Pogoji za pridobitev mikrodokazila:

Minimal standards for obtaining micro-credential:

Udeleženec mora obiskovati usposabljanje in oddati ustrezno projektno nalogo.	The participant must attend the training and submit the relevant project assignment.
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Reference nosilca/Lecturer's references:

SANDAK, Anna Malgorzata, SANDAK, Jakub Michal, BRZEZICKI, Marcin, KUTNAR, Andreja. Bio-based building skin. Singapore: Springer Open, cop. 2019. XV, 183 str., ilustr. Environmental footprints and eco-design of products and processes. ISBN 978-981-13-3746-8, ISBN 978-981-13-3747-5. ISSN 2345-7651. <https://rd.springer.com/content/pdf/10.1007%2F978-981-13-3747-5.pdf>, DOI: 10.1007/978-981-13-3747-5.

KUTNAR, Andreja, SANDAK, Anna Malgorzata, SANDAK, Jakub Michal. Sustainable architecture : reuse and recycling with biomaterials. Rassegna di architettura e urbanistica. sett.-dic. 2024, anno 59, n. 174, str. 112-118

KUTNAR, Andreja. An introduction to the New European Bauhaus and NEB Academy : commentary. International wood products journal. 2025, vol. <online first>, no. , str. 1-2, ilustr. ISSN 2042-6453. <https://journals.sagepub.com/doi/10.1177/20426445251395939>, DOI: 10.1177/20426445251395939

PRELOVŠEK NIEMELÄ, Eva, ACQUAH, Richard, KAVKA, Urban, NIEMELÄ, Aarne, KUTNAR, Andreja, ŠUŠTERŠIČ, Iztok, MIKULJAN, Marica. Weather protection and moisture content of large mass timber buildings during construction. V: Woodrise 2022 : Renovation, restoration, & rehabilitation of urban buildings using wood-based technologies : Portorož, Slovenia, 6-9 September 2022 : book of abstracts. Woodrise 2022, Renovation, restoration, & rehabilitation of urban buildings using wood-based technologies, Portorož, Slovenia, 6-9 September 2022. Electronic ed. Izola: Innorenew CoE; Koper: University of Primorska Press, 2022. Str. 47-49, ilustr. ISBN 978-961-293-189-6, ISBN 978-961-293-190-2. <https://www.hippocampus.si/ISBN/978-961-293-189-6.pdf>.