

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:

IAQ nadzor v stavbah z IoT
IAQ Monitoring in Building with IoT

Študijsko področje po KLASIUS P-16

Study field according to KLASIUS P-16:

061

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

classic

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
6		6			18	1

Nosilec predmeta/Lecturer:

(So)izvajalci/(Co)-Lecturers:

Prof. Dr. Michael Mrissa

Assist. Prof. Dr. Aleksandar Tošić

Assist. Prof. Dr. Niki Hrovatin

Jezik izvedbe

Language of instruction

Angleščina

English

Maksimalno število udeležencev

Maximum number of participants:

15

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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:

Delavci in študenti v gradbenem ekosistemu

Osnovno znanje programiranja (Bash, Python in splet) ter upravljanja operacijskih sistemov.

Prerequisites:

Construction ecosystem workers and students

Basic knowledge in programming (Bash python and Web) and operating system administration.

Vsebina:

Pregled elementov zaznavanja – pretvorniki/senzorji,
Uvod v krmilnike in razvojno ploščo Raspberry Pi (RPi),
Bash skripte in storitve sistema UNIX,
Komunikacijski protokoli in interakcija z zunanjimi sistemi – splet, HTTP in API-ji.

Content (Syllabus outline):

Overview sensing elements transducers/sensors.
Introduction to controllers and the RPi board.

Bash scripts and UNIX system services.
Communication protocols and interaction with external systems Web, HTTP and APIs.

Literatura in viri/Readings:

1. Lea, Perry. IoT and Edge Computing for Architects: Implementing edge and IoT systems from sensors to clouds with communication systems, analytics, and security. Packt Publishing Ltd, 2020.
2. Smart, Gary. Practical Python Programming for IoT: Build Advanced IoT Projects Using a Raspberry Pi 4, MQTT, RESTful APIs, WebSockets, and Python 3. Packt Publishing Ltd, 2020.
3. Hanes, David, et al. IoT fundamentals: Networking technologies, protocols, and use cases for the internet of things. Cisco Press, 2017.

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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:

Razume in razlikuje med vrstami senzorjev.
Nauči se nastaviti razvojno ploščo Raspberry Pi (RPI).
Poveže RPI s senzorjem in prejme podatke.
Zapiše bash skripto za zbiranje podatkov s senzorja.
Zapiše skripto za pošiljanje podatkov na oddaljen strežnik.
Interpretira in analizira podatke senzorjev za praktične IoT aplikacije.

Objectives and competences:

Understand and differentiate between sensor types.
Learn how to setup a RPi.
Connect a RPi to a sensor and receive the data.
Write a bash script to collect the data from the sensor.
Write a script to send the data to a remote server.
Interpret and analyze sensor data for practical IoT applications.

Predvideni učni izidi:

Znanje in razumevanje:
Poznavanje IAQ nadzora v stavbah z IoT.
Sposobnost za analizo, sintezo in predvidevanje rešitev ter njihovih posledic konkretnih problemov z uporabo znanstvenih metod.

Uporaba in refleksija:

Spoznavanje in razumevanje IAQ nadzora v stavbah z IoT, 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.

Intended learning outcomes:

Knowledge and understanding:

Expertise in IAQ monitoring in building with IoT.
The ability for analysis, synthesis and anticipation of solutions and their consequences for target problems using the scientific methodology.

Use and reflection:

Understanding and recognizing the IAQ monitoring in building with IoT, 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.

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Sposobnost za upravljanje s časom, za samo pripravo in načrtovanje ter samokontrolo izvajanja postopkov. Sposobnost timskega dela.	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	<i>Learning and teaching methods:</i> Forms of teaching: • lectures • exercises • individual work Teaching methods: explanation, debates, discussion, problem-based learning, case studies
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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:

Za pridobitev dodeljenih kreditnih točk mora udeleženec pripraviti projektno nalogo spremljanja kakovosti zraka v notranjih prostorih (IAQ) z ustno predstavitvijo.	To collect the assigned credit points, the participant must prepare an IAQ monitoring project with oral presentation.
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Reference nosilca/Lecturer's references:

Vodenje projektov:

1. BI-US/22-24-153 Decentralizirane skupnosti za monitoring stavb, 1.7.2022 - 30.6.2024
2. J2-2504 Avtonomno robno računanje za spremljanje kakovosti zraka, 1.9.2020 - 31.8.2023

Izvirni znanstveni članki:

1. HROVATIN, Niki, TOŠIĆ, Aleksandar, MARISSA, Michael Nicolas, VIČIČ, Jernej. A general purpose data and query privacy preserving protocol for wireless sensor networks. IEEE transactions on information forensics and security. [Print ed.]. 2023, vol. 18, str. 4883-4898
2. RIGGIO, Mariapaola, MARISSA, Michael Nicolas, KRÉSZ, Miklós Ferenz, VCELAK, Jan, SANDAK, Jakub Michal, SANDAK, Anna Malgorzata. Leveraging structural health monitoring data through avatars to extend the service life of mass timber buildings. Frontiers in built environment. 2022, vol. 8, art. 887593, str. 1-7
3. EKKAL, Nawel, BENSLIMANE, Sidi Mohamed, MARISSA, Michael Nicolas, YOUNG PARK, Cheol, BOUDAA, Boudjemaa. Proactive and reactive context reasoning architecture for smart web services. International journal of data mining, modelling and management. [Print ed.]. 2020, vol. 12, no. 1, str. 1-27