

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet: Pametne stavbe
Course title: Smart Buildings

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Tehnologije in sistemi – prva stopnja	/	tretji	peti
Technologies and Systems – 1st cycle	/	third	fifth

Vrsta predmeta / Course type

izbirni/elective

Univerzitetna koda predmeta / University course code:

TS IP UN 5

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Laboratorijske vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
45		15	15		100	6

Nosilec predmeta / Lecturer:

doc. dr. Elvis Hozdić

**Jeziki /
Languages:**

**Predavanja /
Lectures:** Slovenski/Slovenian
Vaje / Tutorial: Slovenski/Slovenian

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

- vpis v tretji letnik študija.

Prerequisites:

- enrollment in the third year of study.

Vsebina:

- Osnovni koncepti pametne stavbe – digitalni podaljšek arhitekture in tehničnega napredka za višjo kakovost življenja –.
- Interakcija stavba – uporabnik
- Žična oprema pametnih stavb
- Brežična oprema pametnih stavb
- Sistemi za pridobivanje, prenos in shranjevanje podatkov.
- Uporaba sistemov za upravljanje posameznih in skupine stavb (varovanje,

Content (Syllabus outline):

- Basic concepts of a smart building – a digital extension of architecture and technological advances for a higher quality of life –.
- Building-user interaction
- Wired equipment of smart buildings
- Wireless equipment of smart buildings
- Systems for acquiring, transferring and storing data.
- Use of systems for managing individual buildings and groups of buildings (security, heating, cooling, fire safety, social care, IT).

gretje, hlajenje, požarna varnost, socialna oskrba, informatika).

Temeljni literatura in viri / Readings:

Temeljna literatura/Basic literature

Priporočljiva literatura/Recommended

1. Sinopoli James M: (2010) Smart Buildings Systems for Architects, Owners and Builders, Elsevier
2. Thomas Mundt, Peter Wickboldt, "Security in building automation systems - a first analysis", *Cyber Security And Protection Of Digital Services (Cyber Security) 2016 International Conference On*, pp. 1-8, 2016.
3. Sanja Lazarova-Molnar, Hamid Reza Shaker, Nader Mohamed, Bo Nørregaard Jørgensen, "Fault detection and diagnosis for smart buildings: State of the art trends and challenges", *Big Data and Smart City (ICBDSC) 2016 3rd MEC International Conference on*, pp. 1-7, 2016.
4. Alex Cassidy, Arye Nehorai, "Creating influential nodes in a smart building social network", *Smart Grid Communications (SmartGridComm) 2015 IEEE International Conference on*, pp. 659-664, 2015.
5. Jhi-Young Joo, Marija D. Ilić, "An Information Exchange Framework Utilizing Smart Buildings for Efficient Microgrid Operation", *Proceedings of the IEEE*, vol. 104, no. 4, pp. 858-864, 2016.

Cilji in kompetence:

Učna enota prispeva predvsem k razvoju naslednjih splošnih in specifičnih kompetenc:

- sposobnost obvladanja standardnih razvojnih metod, postopkov in procesov,
- sposobnost uporabe pridobljenega teoretičnega znanja v praksi,
- sposobnost obvladovanja razvoja in napredka,
- kooperativnost, usposobljenost za timsko delo,
- sposobnost razumevanja in uporabe sodobnih teorij s področja tehniških, tehnoloških in naravoslovnih ved,
- sposobnost interdisciplinarnega povezovanja znanja,
- sposobnost reševanja konkretnih delovnih problemov na področju tehnologij in sistemov z uporabo standardnih strokovnih metod in postopkov.

Objectives and competences:

The learning unit mainly contributes to the development of the following general and specific competences:

- the ability to master standard development methods, procedures and processes,
- the ability to use acquired theoretical knowledge in practice,
- the ability to manage development and progress,
- cooperativeness, teamwork skills,
- the ability to understand and apply modern theories in the field of technical, technological and natural sciences,
- the ability to integrate knowledge in an interdisciplinary manner,
- the ability to solve concrete work problems in the field of technologies and systems using standard professional methods and procedures.

Predvideni študijski rezultati:

Znanje in razumevanje:

Študent/študentka:

- Spozna pomen uvajanja IoT tehnologije v stavbe.
- Dobi osnovna znanja za izbiro sistemov.
- Pridobi znanja za izračun prihrankov na osnovi uvajanja IoT sistemov v stabe.
- Spozna pravno regulativo (standarde), ki ureja to področje in je osnova za projektno delo.
- Doume vpliv posameznih rešitev na okolje.
- Spozna druge tehnične discipline povezane z uvajanjem IoT v stavbe: elektrotehniko, elektroniko, varstvo podatkov.
- Pridobi osnovno znanje za uporabo različnih simulacijskih metod.

Intended learning outcomes:

Knowledge and understanding:

Student:

- Learns the importance of implementing IoT technology in buildings.
- Acquires basic knowledge for selecting systems.
- Acquires knowledge to calculate savings from the introduction of IoT systems in buildings.
- Learns about the legal regulations (standards) that govern this area and are the basis for project work.
- Understands the impact of each solution on the environment.
- Becomes familiar with other technical disciplines related to the introduction of IoT in buildings: electrical engineering, electronics, data protection.
- Acquires basic knowledge of the application of various simulation methods.

Metode poučevanja in učenja:

- *predavanja* z aktivno udeležbo študentov (razlaga, diskusija o problemih, razvijanje ustvarjalnosti),
- *vodeni individualni študij* za uporabo simulacijskih metod,
- *projekt* za utrjevanje znanja in njegovo praktično uporabo,
- *seznanjanje z merilnimi instrumenti*, uporabnimi za meritve IoT v stavbah,
- *uporaba spletnih virov* in seznanjanje s široko strokovno literaturo ter praktična uporaba dosegljive dokumentacije (knjig, revij, arhivov itd.),
- *strokovne ekskurzije* in ogledi izbranih pomembnih objektov z uporabo IoT.

Learning and teaching methods:

- *lectures with* active participation of students (explanation, discussion of problems, development of creativity),
- *guided individual study* for the use of simulation methods,
- *a project* for consolidating knowledge and its practical application,
- *familiarization with measuring instruments* useful for IoT measurements in buildings,
- *use of online resources* and familiarization with a wide range of professional literature and practical use of available documentation (books, magazines, archives, etc.),
- *professional excursions* and tours of selected important facilities using IoT.

Načini ocenjevanja:	Delež (v %) / Weight (in %)	Assessment:
Način (pisni izpit, ustno izpraševanje, naloge, projekt): <ul style="list-style-type: none"> • pisni izpit • ustni izpit • projektno in seminarsko delo Ocenjevalna lestvica: ECTS.	25 55 20	Type (examination, oral, coursework, project): <ul style="list-style-type: none"> • written exam • verbal exam • project and seminar work Grading scale: ECTS.