UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Ime predmeta:	TEHNOLOŠKA PODPORA V MOBILNOSTNIH SISTEMIH
Course title:	TECHNOLOGICAL SUPPORT IN MOBILITY SYSTEMS

Študijski program in stopnja **Study programme and cycle**	**Študijska smer** **Study option**	**Letnik** **Year of study**	**Semester** **Semester**
LOGISTIKA SISTEMOV 2. stopnja		2.	3.
SYSTEM LOGISTICS 2nd degree		2.	3.

Vrsta predmeta (obvezni ali izbirni) / **Course type (compulsory or elective)**	IZBIRNI ELECTIVE
Univerzitetna koda predmeta / University course code:	MAG

Predavanja **Lectures**	**Seminar** **Seminar**	**Vaje** **Tutorial**				**Klinične vaje** **Clinical training**	**Druge oblike študija** **Other forms of study**	**Samost. delo** **Individual work**	**ECTS**
		AV	EV	LV	RV				
20 e-P 20 a-P			15	25				100	6

Nosilec predmeta / Course coordinator:	**DARJA TOPOLŠEK**
Jeziki /Languages:	**Predavanja / Lectures:** SLOVENSKI/SLOVENE
	Vaje / Tutorial: SLOVENSKI/SLOVENE

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisites for enrolling in the course or for performing study obligations:**
Ni pogojev.	None.

Vsebina (kratek pregled učnega načrta):	**Content (syllabus outline):**
1. Tehnološke rešitve v pametnih skupnostih in intralogistiki (tehnološka arhitektura, telematika, tehnologije pametnega mesta v navezavi z infrastrukturo). 2. Distribucijske strategije v pametnih skupnostih in oskrbovalnih verigah ter potrebna tehnološka podpora (distribucijski sistemi v mestih, načrtovanje in delovanje transportnih terminalov in vozlišč). 3. Modeliranje in simulacije prometnih tokov z namensko programsko opremo ter strategije upravljanja prometnih tokov. 4. Spremljanje učinkovitosti pametnih skupnosti in mobilnosti znotraj njih Sodobne tehnologije v prometni varnosti (vplivi na voznika med vožnjo s poudarkom na vizualni	1. Technological solutions in smart communities and intralogistics (technological architecture, telematics, smart city technologies in connection with infrastructure). 2. Distribution strategies in smart communities and supply chains and the needed technological support (urban distribution systems, design and operation of transport terminals and hubs). 3. Modeling and simulations of traffic flows with dedicated software and traffic flow management strategies. 4. Monitoring the effectiveness of smart communities and mobility within them. Modern technologies in traffic safety (influences on the driver while driving with emphasis on visual attention, sensors and technologies in infrastructure, driver assistance systems).

pozornosti, senzorika in tehnologije v infrastrukturi, asistenčni sistemi v vozilih).	

Temeljni literatura in viri / Reading materials:

Topolšek, D., Cvahte Ojsteršek, T. Tehnološka podpora v mobilnostnih sistemih, e-gradivo (v pripravi)
Brdulak, A., Brdulak, H. (2017) Happy city: how to plan and create the best livable area for the people. Springer.
Skabardonis, A. (2020). Traffic management strategies for urban networks: smart city mobility technologies. In Transportation, Land Use, and Environmental Planning (pp. 207-216). Elsevier.
Topolšek, D., Cvahte Ojsteršek, T. (2016). Mestna logistika in mobilistika: e-gradivo. Celje: Fakulteta za logistiko.
Chow, J. (2018). Informed Urban transport systems: Classic and emerging mobility methods toward smart cities. Elsevier.
Hendrigan, C. (2019). A Future of Polycentric Cities: How Urban Life, Land Supply, Smart Technologies and Sustainable Transport are Reshaping Cities. Springer Nature.
Flügge, B. (Ed.). (2017). Smart Mobility–Connecting Everyone: Trends, Concepts and Best Practices. Springer.
Shinar, D. (Ed.). (2017). Traffic safety and human behavior. Emerald Group Publishing.

Cilji in kompetence:	**Objectives and competences:**
Cilji predmeta so: • opredeliti vlogo tehnologije in njihove implementacije v pametnih skupnostih, • predstaviti možne tehnološke rešitve za izvajanje in upravljanje naprednih mobilnostnih storitev in njihove praktične aplikacije, • pojasniti vlogo distribucije v zagotavljanju delovanja pametnih skupnosti in prikazati pomen in upravljanje transportnih terminalov, • predstaviti primer modeliranja in simulacije prometnih tokov, • opredeliti nabor možnosti za spremljanje mobilnosti v pametnih skupnostih in načine izbora in uporabe metrik znotraj njih, • nadgraditi znanje na področju prometne varnosti s predstavitvijo sodobnih tehnologij s področja in njihove aplikacije.	The objectives of the course are to: • define the role of technology and its implementation in smart communities, • present possible technological solutions for implementation and management of advanced mobility services and their practical applications, • explain the role of distribution in ensuring the functioning of smart communities and show the importance and management of transport terminals, • present an example of modeling and simulation of traffic flows, • identify a set of options for monitoring mobility in smart communities and ways to select and use metrics within them, • improve knowledge in the field of traffic safety by presenting modern technologies in the field and their applications.
Kompetence, ki jih pridobijo študenti: • spozna in razume arhitekturo pametnih skupnosti in vlogo tehnologij v njej, • se usposobi za izbiro tehnološke podpore za delovanje mobilnostnega sistema v pametnih skupnostih, • spozna, razume in je sposoben izbrati distribucijske strategije v pametnih skupnostih, • sposoben je izdelati enostaven model prometne situacije in simulirati vpliv sprememb in posegov na prometne tokove, • spozna in zna aplicirati relevantne standarde v pametnih skupnostih,	Competencies acquired by students: • knows and understands the architecture of smart communities and the role of technologies in it, • is trained to select technological support for operations of the mobility system in smart communities, • knows, understands and is able to choose distribution strategies in smart communities, • is able to create a simple model of a traffic situation and simulate the impact of changes and interventions on traffic flows, • knows how to apply relevant standards in smart communities,

• sposoben je izbrati in implementirati tehnologije, ki bodo pripomogle k povečanju prometne varnosti v pametnih skupnostih.	• is able to select and implement technologies that will help increase traffic safety in smart communities.

Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanje in razumevanje: Študent je ob zaključku predmeta zmožen: • razumeti vpliv tehnologij na zagotavljanje pametne mobilnosti, • znati uporabiti tehnološke rešitve za načrtovanje prometnih situacij in tokov, • znati načrtovati distribucijski sistem v pametni skupnosti, • znati opredeliti parametre spremljanja učinkovitosti mobilnosti in implementirati sistem spremljanja v skladu z zastavljenimi metrikami, • razumeti vlogo tehnološke podpore pri zagotavljanju prometne varnosti in njenega proučevanja.	Knowing and understanding: At the end of the course, the student is able to: • understand the impact of technologies on ensuring smart mobility, • use technological solutions for planning traffic situations and flows, • design a distribution system in a smart community, • define the parameters of monitoring effectiveness of mobility and implement a monitoring system in accordance with the set metrics, • understand the role of technology support in ensuring and studying road safety.

Metode poučevanja in učenja:	**Learning and teaching methods:**
Predavanja: pri predavanjih študent spozna teoretične vsebine predmeta. Del predavanj se izvaja na klasični način v predavalnici, del pa v obliki e-predavanj (e-predavanja se lahko izvajajo na videokonferenčni način ali s pomočjo posebej v ta namen didaktično pripravljenih e-gradiv v virtualnem elektronskem učnem okolju). Vaje: pri vajah študent utrdi teoretično znanje in spozna aplikativne možnosti. Praktične strokovne ekskurzije v podjetja in druga okolja. Del vaj se izvaja na klasični način v predavalnici, del pa v obliki e-vaj (e-vaje se lahko izvajajo na videokonferenčni način ali s pomočjo posebej v ta namen didaktično pripravljenih e-gradiv v virtualnem elektronskem učnem okolju).	Lectures: Students understand the theoretical frameworks of the course. Part of the lecture course is in a classroom while the rest is in the form of e-learning (e-lectures can be conducted in a videoconference way or with the help of specially prepared didactic e-materials in a virtual electronic learning environment). Tutorials: in the tutorials the student consolidates theoretical knowledge and learns about application possibilities. Practical professional excursions to companies and other relevant environments. Part of the tutorials is performed in the classic way in a lecture room, and part in the form of e-tutorials (e-tutorials can be performed in a videoconferencing way or with the help of specially prepared didactic e-materials in a virtual electronic learning environment).

Načini ocenjevanja:	Delež (v %) / Share (in %)	**Assessment methods:**
Opravljene obveznosti e-predavanj in e-vaj so pogoj za pristop k izpitu.		Successful completion of e-lectures and e-tutorials is a prerequisite for entering the exam.Written exam.
Pisni izpit.	40%	Project work.
Projektna naloga.	40%	Grades from activities at lectures and e-lectures.
Ocene sprotnih aktivnosti pri predavanjih in e-predavanjih.	10%	Grades from activities at tutorials and e-tutorials.
Ocene sprotnih aktivnosti pri vajah in e-vajah.	10%	

Reference nosilca / Course coordinator's references:

- KAMNIK, Rok, NEKREP, Matjaž P., TOPOLŠEK, Darja. Using the scanners and drone for comparison of point cloud accuracy at traffic accident analysis. Accident analysis and prevention, ISSN 0001-4575. [Print ed.], Feb. 2020, vol. 135, str. 1-9, doi: 10.1016/j.aap.2019.105391. [COBISS.SI-ID 22872086].
- TOPOLŠEK, Darja, BABIĆ, Dario, BABIĆ, Darko, CVAHTE OJSTERŠEK, Tina. Factors influencing the purchase intention of autonomous cars. Sustainability, ISSN 2071-1050, 2020, vol. 12, iss. 24, str. [1]-16, ilustr. https://doi.org/10.3390/su122410303. [COBISS.SI-ID 42536963].
- CVAHTE OJSTERŠEK, Tina, TOPOLŠEK, Darja. Eye tracking use in researching driver distraction : a scientometric and qualitative literature review approach. Journal of eye movement research, ISSN 1995-8692, 2019, vol. 12, no. 3, str. 1-30, ilustr. https://doi.org/10.16910/jemr.12.3.5, doi: 10.16910/jemr.12.3.5. [COBISS.SI-ID 513043517].
- KRAMAR, Uroš, DRAGAN, Dejan, TOPOLŠEK, Darja. The holistic approach to urban mobility planning with a modified focus group, SWOT, and fuzzy analytical hierarchical process. Sustainability, ISSN 2071-1050, 2019, vol. 11, iss. 23, str. [1]-29, ilustr. https://doi.org/10.3390/su11236599, doi: 10.3390/su11236599. [COBISS.SI-ID 513044029].
- TOPOLŠEK, Darja, DRAGAN, Dejan. Relationships between the motorcyclists' behavioural perception and their actual behaviour. Transport, ISSN 1648-3480. [Online ed.], 2018, no. 1, vol. 33, str. 151-164. https://journals.vgtu.lt/index.php/Transport/article/view/151, doi: 10.3846/16484142.2016.1141371. [COBISS.SI-ID 512755261].
- TOPOLŠEK, Darja, AREH, Igor, CVAHTE OJSTERŠEK, Tina. Examination of driver detection of roadside traffic signs and advertisements using eye tracking. Transportation research. Part F, Traffic psychology and behaviour, ISSN 1369-8478. [Print ed.], Nov. 2016, vol. 43, str. 212-224, ilustr. http://dx.doi.org/10.1016/j.trf.2016.10.002, doi: 10.1016/j.trf.2016.10.002. [COBISS.SI-ID 3228394].

  TOPOLŠEK, Darja, CVAHTE OJSTERŠEK, Tina. Exploring public attitudes towards urban access regulation schemes : case of Maribor. V: BRDULAK, Anna (ur.), BRDULAK, Halina (ur.). Happy city : how to plan and create the best livable area for the people, (Ecoproduction, ISSN 2193-4614). [S. l.]: Springer. cop. 2017, str. 303-318, ilustr. https://link.springer.com/chapter/10.1007/978-3-319-49899-7_17. [COBISS.SI-ID 512833085].