UNIVERZITET U SARAJEVU

FAKULTET ZA SAOBRAĆAJ I KOMUNIKACIJE

STUDIJSKI PROGRAM
CESTOVNI SAOBRAĆAJ
II CIKLUS STUDIJA
NA UNIVERZITETU U SARAJEVU – FAKULTETU ZA SAOBRAĆAJ I KOMUNIKACIJE

Nastavni plan

Popis obaveznih i predviđenih izbornih predmeta sa šiframa, brojem ECTS bodova i brojem kontakt sati nastave potrebnih za njihovu izvedbu (vježbe, predavanja, praksa, seminar, terenski rad, laboratorijske vježbe isl.);

NASTAVNI PLAN ZA ODSJEK: SAOBRAĆAJ, USMJERENJE: CESTOVNI SAOBRAĆAJ

R.b.	Šifra predmeta	Naziv predmeta	Status	I sem.				II sem.				III sem.				IV sem.
				P	V	L	ECTS	P	V	L	ECTS	P	V	L	ECTS	Izrada rada (ECTS)
1.	01ATCOS020101	Menadžment u transportu i komunikacijama	obavezni	3	2	1	6									
2.	02TRTOS020101	Održivi razvoj i okolišni inžinjering	obavezni	3	2	1	6									
3.	03TRTOS020101	Logistika i inteligentni transportni sistemi	obavezni	3	2	1	6									
4.	04TRTOS020101	Planiranje saobraćajno transportnih sistema u cestovnom saobraćaju	obavezni	3	2	1	6									
5.	05TRTOS020101	Organizacija i upravljanje prijevozom putnika u gradovima	obavezni	3	2	1	6									
6.	06TRTOS020102	Intermodalni transport	obavezni					3	2	1	6					
7.	07TRTOS020102	Informacione tehnologije i špeditersko poslovanje	obavezni					3	2	1	6					
8.	08TRTOS020102	Planiranje i kapaciteti cestovnih saobraćajnica	obavezni					3	2	1	6					
9.			izborni					3	2	1	6					
10.			izborni					3	2	1	6					
11.	11TRTOS020203	Metode vrednovanja i odlučivanja u saobraćajnom projektovanju	obavezni									3	2	1	6	
12.	12TRTOS020203	Elementi sigurnosti cesta	obavezni									3	2	1	6	
13.			izborni									3	2	1	6	
14.			izborni									3	2	1	6	
15.			izborni									3	2	1	6	
16.	16TRTOS020204	Završni master rad	obavezni													30
Broj potrebnih kredita				**30**				**30**				**30**				**30**

Izborni predmeti: usmjerenje: cestovni saobraćaj

Šifra predmeta	Naziv predmeta	Broj sati			ECTS	Semestar
		P	V	L/PR		

09-10-1TRTES020102	Upravljanje i organizacija stacionarnog saobraćaja	3	2	1	6	**II**
09-10-2TRTES020102	Elementi sigurnosti cestovnih vozila	3	2	1	6	**II**
09-10-3TRTES020102	Zaštita u saobraćaju i transportu	3	2	1	6	**II**
09-10-4TRTES020102	Tehnološke analize cestovnog saobraćaja	3	2	1	6	**II**
09-10-5TRTES020102	Optimizacija i upravljanje voznim parkovima	3	2	1	6	**II**
09-10-6TRTES020102	Standardizacija u cestovnom saobraćaju	3	2	1	6	**II**
09-10-7TRTES020102	Primjena GIS-a u saobraćajnom inžinjerstvu	3	2	1	6	**II**
09-10-8TRTES020102	Električna i autonomna cestovna vozila	3	2	1	6	**II**
09-10-9TRTES020102	E vozila u javnom prijevozu i e-car sharing	3	2	1	6	**II**
09-10-10TRTES020102	Propisi i klasifikacija u transportu opasnih materija	3	2	1	6	**II**
13-14-15-1TRTES020203	Elementi ekspertiza saobraćajnih nezgoda	3	2	1	6	**III**
13-14-15-2TRTES020203	Upravljanje i organizacija logističkih centara u saobraćaju i transportu	3	2	1	6	**III**
13-14-15-3TRTES020203	Transportne mreže u cestovnom saobraćaju	3	2	1	6	**III**
13-14-15-4TRTES020203	Metodologija istraživačkog i naučnog rada	3	2	1	6	**III**
13-14-15-5TRTES020203	Saobraćajna politika	3	2	1	6	**III**
13-14-15-6TRTES020203	Geoinformacijski sistemi	3	2	1	6	**III**
13-14-15-7TRTES020203	Softverski alati za simulaciju i analizu cestovnog saobraćaja	3	2	1	6	**III**
13-14-15-8TRTES020203	ICT u cestovnom saobraćaju	3	2	1	6	**III**
13-14-15-9TRTES020203	Inspekcija cesta (RSI) i revizija cesta (RSA)	3	2	1	6	**III**
13-14-15-10TRTES020203	Održiva urbana mobilnost	3	2	1	6	**III**
13-14-15-11TRTES020203	IoT rješenja za industriju električnih vozila	3	2	1	6	**III**
13-14-15-12TRTES020203	Upravljanje transportom opasnih materija	3	2	1	6	**III**

Opis silabusa na studijskom programu Cestovni saobraćaj na b/h/s jeziku

Opis svakog predmeta na usmjerenju *Cestovni saobraćaj*

Šifra predmeta: 01ATCOS020101	**Naziv predmeta: MENADŽMENT U TRANSPORTU I KOMUNIKACIJAMA**		
Ciklus: II	**Godina: I**	**Semestar: I**	**Broj ECTS kredita: 6**

Status: Obavezni predmet	**Ukupan broj sati: 90** Razrada distribucije sati po tipu: Predavanja: 45 Vježbe: 45 Seminar: Terenski rad: - Laboratorijske vježbe: - Praksa: -
Učesnici u nastavi	**Nastavnici i saradnici izabrani na oblast kojoj predmet pripada/predmet**
Preduslov za upis:	NE
Cilj (ciljevi) predmeta:	Cilj predmeta je upoznavanje sa djelovanjem saobraćajnog sistema u tržišnim uvjetima i međunarodnim standardima, kako bi se obezbjedilo efektivno i efikasno poslovanje. Osposobljavanje studenata u sticanju određenih znanja o standardima i standardizaciji, kao i međuvezama različitih dijelova proizvodnje i ekonomskih procesa na koje utiče tehnička standardizacija.
Tematske jedinice: *(po potrebi plan izvođenja po sedmicama se utvrđuje uvažavajući specifičnosti organizacionih jedinica)*	1. Osnove menadžmenta. Pojam, proces menadžmenta i međuzavisnost sa organizacijom. Pojam menadžmenta i procesa menadžmenta. Karakteristike savremenog menadžera. Funkcije menadžera. 2. Opće i specifične karakteristike menadžmenta u prometnom sustavu. Problematika organizacije i menadžmenta u prometnom sustavu. Definicije i sadržaj menadžmenta. Menadžment i poduzetništvo u transportnim i telekomunikacijskim preduzećima. 3. Opće i specifične karakteristike menadžmenta u prometnom sustavu. Menadžerski poslovi u upravama, zavodima i agencijama. Razvitak logističkog menadžmenta. Odnosi prometne politike i menadžmenta. Razvoj prometnog sustava i prostorno-gospodarsko strukturiranje. 4. Menadžerski koncepti poboljšanja i/ili inoviranje poslovnih procesa. Procesno-orjentirani menadžment. Inoviranje i/ili reinženjering poslovih procesa. 5. Planiranje kao funkcija i aktivnost menadžmenta. Planiranje u prometnom preduzeću. Politike i strategije prometnog preduzeća. Procesni pristup strategijskom planiranju. 6. Planiranje kao funkcija i aktivnost menadžmenta. Strategijska analiza konkurentske strukture prometne grane. Metode scenarija u izboru efektivne strategije preduzeća. 7. Organizacijska struktura i procesi organizacije. Pojam i šira shvatanja organizacije. Organizacijska struktura. 8. Organizacijska struktura i procesi organizacije. Uređivanje odnosa u organizaciji. 9. Organizacijska struktura i procesi organizacije. Procesna i na znanju utemeljena organizacija. Primjeri organizacijske strukture nekih transportnih i telekomunikacijskih poduzeća. 10. Vođenje poslova i motiviranje. Vođenje poslova i vodstvo. 11. Vođenje poslova i motiviranje. Utjecaji na ponašanje ljudi i motivacija.

	12. Upravljanje ljudskim resursima. Upravljanje ljudskim resursima kao funkcija menadžmenta 13. Upravljanje ljudskim resursima. Aktivnosti u procesu upravljanja ljudskim resursima. Osobni razvitak menadžera. 14. Menadžerska kontrola i upravljanje kvalitetom. Osnove savremene standardizacije. Metode preuzimanja i označavanja standarda, stepeni usklađenosti i terminologija u vezi sa preuzimanjem standarda.Infrastruktura kvaliteta. 15. Menadžerska kontrola i upravljanje kvalitetom. Standardi sistema upravljanja (MSS - Management Systems Standards). Integrisani sistemi upravljanja (IMS - Integrated Management Systems).
Ishodi učenja:	**Znanje:** Stečena znanja koristit će se za prepozanavanje glavnih tehnoloških procesa, kao i modela upravljanja specifičnih za saobraćajne sisteme. **Vještine:** Sposobnost primjene teorijskih i praktičnih znanja iz oblasti menadžmenta u prometu. **Kompetencije:** Sistemski pristup u razumjevanju standardizacije, ovladavanje savremenom poslovnom terminologijom, kao i predočeni praktični primjeri iz područja saobraćaja i komunikacija, pomoći će studentima u njihovom uključivanju u tehničke i druge aktivnosti po završetku studija i zapošljavanju.
Cilj održivog razvoja (SDG):	SDG4 – Kvalitetno obrazovanje SDG8 – Dostojanstven rad i ekonomski rast SDG9 – Industrija, inovacije i infrastruktura SDG11 – Održivi gradovi i zajednice SDG12 – Održiva potrošnja i prozvodnja SDG16 – Mir, pravda i snažne institucije
Metode izvođenja nastave:	Metoda usmenog izlaganja, metoda razgovora, metoda demonstracije, metoda rada u skupini.
Metode provjere znanja sa strukturom ocjene:	Ocjena kreativnosti na nastavi i vježbama uz izradu samostalnih radova, ocjena parcijalnog testa u toku nastave kao i ocjena završnog ispita. Kriterijum praćenja rada i ocjenjivanja studenta u toku nastave i to prema sljedećem načinu: – Domaća zadaća/seminarski rad/praktični rad/ 15 bodova (%), položeno ako se osvoji najmanje 55 %. – I Parcijalni ispit/test/provjera znanja/35 bodova (%), položen je ako se osvoji najmanje 55 %. – Završni ispit (II Parcijalni) 50 bodova (%), položeno ako se osvoji najmanje 55 %. – Završni ispit (Integralni) 85 bodova (%), položeno ako se osvoji najmanje 55 %. Završni ispit se organizuje kao pismeni/usmeni. Student na završnom ispitu može da polaže gradivo koje nije polagao i/ili uspješno okončao tokom trajanja semestra. Potreban uslov za uspješno okončan ispit je postignut rezultat od najmanje 55% bodova od maksimalnog broja bodova na parcijalnom i završnom dijelu ispita, a dovoljan uslov je da suma ostvarenih bodova (kroz: domaću zadaću, prisustvo, parcijalni i završni ispit) bude 55. Zadaća se organizuje kroz pisanje domaće zadaće i projekata. Zadaća nema mogućnost popravljanja. Za studente koji nisu uspješno okončali parcijalni ispit, završni ispit se sastoji iz cjelokupnog pređenog gradiva u toku nastave. Popravni ispit se organizuje kao i završni ispit.

	Konačan uspjeh studenta nakon svih predviđenih oblika provjere znanja, vrednuje se i ocjenjuje sistemom ocjenjivanja kako slijedi: a) 10 (A) - izuzetan uspjeh bez grešaka ili sa neznatnim greškama, nosi 95-100 bodova; b) 9 (B) - iznad prosjeka, sa ponekom greškom, nosi 85-94 bodova; c) 8 (C) - prosječan, sa primjetnim greškama, nosi 75-84 bodova; d) 7 (D) - općenito dobar, ali sa značajnijim nedostacima, nosi 65-74 bodova; e) 6 (E) - zadovoljava minimalne uslove, nosi 55-64 bodova; f) 5 (F, FX) - ne zadovoljava minimalne uslove, manje od 55 bodova. Ukupno vrednovanje svih obaveza studenta u toku semestra, odnosno ocjena na ispitu zasnovana je na ukupnom broju bodova (%) koje je student stekao ispunjavanjem predispitnih obaveza i polaganjem parcijalnog i završnog ispita, a prema kvalitetu stečenih znanja i vještina, i sadrži maksimalno 100 bodova, te se utvrđuje prema sljedećoj skali: Obaveze studenta Bodovi (%) Prisutnost na predavanjima i vježbama... - Zadaća/Seminarski/Praksa/.....15 bodova (%) I Parcijalni ispit/Test/Provjera znanja/.....35 bodova (%) Završni ispit (II Parcijalni) .....50 bodova (%) Završni ispit (Integralni) .....85 bodova (%)
Literatura:	Obavezna: 1. Vujadin B. Vešović, „MENADŽMENT U SAOBRAĆAJU“, Univerzitet u Beogradu, Saobraćajni fakultet, 1997. 2. Šefkija Čekić, Ivan Bošnjak, „MENADŽMENT U TRANSPORTU I KOMUNIKACIJAMA“, Fakultet za saobraćaj i komunikacije UNSA, Fakultet prometnih znanosti UNIZG, Sarajevo, Zagreb, 2000. Dopunska: 1. Alija Behmen, Sabira Salihović: MATERIJALI I ROBE U TRANSPORTU - Knjiga I, klasifikacija, standardizacija, identifikacija, Fakultet za saobraćaj i komunikacije Sarajevo i DES-Sarajevo, Sarajevo, 2007. 2. Alija Behmen, Sabira Salihović: MATERIJALI I ROBE U TRANSPORTU - Knjiga II, kvalitet: osnove, principi, kontrola, Fakultet za saobraćaj i komunikacije Sarajevo i DES-Sarajevo, Sarajevo, 2008. 3. Međunarodni/regionalni/nacionalni standardi

Šifra predmeta: 02TRTOS020101	**Naziv predmeta: ODRŽIVI RAZVOJ I OKOLIŠNI INŽINJERING**		
Ciklus: II	**Godina: I**	**Semestar: I**	**Broj ECTS kredita: 6**
Status: Obavezni predmet		**Ukupan broj sati: 90** Razraditi distribuciju sati po tipu: Predavanja: 30, Vježbe: 20, Seminar: 10, Laboratorijske vježbe: 10, Praksa: 10, Terenski rad: 10.	
Učesnici u nastavi	**Nastavnici i saradnici izabrani na oblast kojoj predmet pripada/predmet**		
Preduslov za upis:	NE		
Cilj (ciljevi) predmeta:	Sticanje edukacijskih oblika u realizaciji programa iz elemenata održivog razvoja i okolišnog inžinjeringa, te praktične analize, elaborati i projekti iz oblasti		

	održivog razvoja i okolišnog inžinjeringa.
Tematske jedinice: *(po potrebi plan izvođenja po sedmicama se utvrđuje uvažavajući specifičnosti organizacionih jedinica)*	1. Uvod – osnove održivog razvoja i ekološkog inženjeringa 2. Zakonski okvir iz oblasti održivog razvoja i okolišnog inženjeringa 3. Zagađenje zraka od saobraćaja - monitoring kvalitete zraka 4. Metode detekcije zagađivača 5. CORINAIR/ COPERT 6. Elementi i način izrade karata buke 7. Elementi izrade studija uticaja na okoliš 8. Javni gradski prijevoz putnika, mobilnost i održivi razvoj 9. Energetska efikasnost, eko test i eko vožnja 10. NEAP, KEAP, LEAP, saobraćaj i transport 11. SEAP, saobraćaj i transport 12. SUMP - saobraćaj i transport 13. SECAP - saobraćaj i transport 14. Nisko karbonski transport i transport nulte emisije 15. Primjeri terenskih istraživanja iz oblasti održivog razvoja i okolišnog inženjeringa
Ishodi učenja:	Znanje: Teorijska i praktična znanja iz oblasti uticaja održivog razvoja i okolišnog inžinjeringa. Osnovni propisi, pravila, metode i postupci u oblasti procjene i analize stanja održivog razvoja. Vještine: Sposobnost primjene teorijskih i praktičnih znanja iz oblasti održivog razvoja i okolišnog inžinjeringa u funkciji očuvanja i zaštite privrednog i drugog razvoja društva sa jedne strane, odnosno unaprijeđenja i razvoja održivog transporta sa druge strane. Kompetencije: Sposobnosti samostalnog razumijevanja i korištenja propisa, korištenja stručne literature, primjene metoda i postupaka, mjerenja i istraživanja, izrada analiza, procjena i praktičnih rješenja, preventivnog djelovanja, te postupaka neophodnih za adekvatnu analizu, procjenu i upravljanje oblasti održivog razvoja i okolišnog inžinjeringa.
Cilj održivog razvoja (SDG):	SDG4 – Kvalitetno obrazovanje - Osigurati uključivo i kvalitetno obrazovanje, te promovirati mogućnosti cjeloživotnog učenja svih ljudi, svih životnih dobi SDG5-Rodna ravnopravnost - Postići rodnu ravnopravnost i osnažiti sve žene i djevojčice. SDG8-Dostojanstven rad i ekonomski rast - Promovirati uključiv i održiv ekonomski rast, zaposlenost i dostojanstven rad za sve. SDG9- Industrija, Inovacije i Infrastruktura -Izgraditi izdržljivu infrastrukturu, promovirati uključivu i održivu industrijalizaciju i poticati inovativnost. SDG11 – Održivi gradovi i lokalne zajednice - Učiniti gradove i naselja uključivim, sigurnim, prilagodljivim i održivim. SDG12-Održiva potrošnja i proizvodnja - Osigurati održive oblike potrošnje i proizvodnje. SDG13-Zaštita klime - Poduzeti hitne akcije u borbi protiv klimatskih promjena i njihovih posljedica SDG17- Partnerstvom do ciljeva- Uvrstiti globalno partnerstvo za održivi razvoj
Metode izvođenja nastave:	Usmeno iznošenje sa prezentacijom i prikazom različitih analiza, studija, modela i metoda u oblasti okolišnog inžinjeringa uz korištenje video i audio zapisa, softvera, mjerne opreme, te samostalno izlaganje pojedinih konkretnih istraživanja. Iniciranje rasprava i diskusija o problemima iz prakse, pojedinačnih zapažanja iz različitih okruženja, izrada samostalnih analiza, istraživanja, mjerenja i modeliranja u oblasti okolišnog inžinjeringa i održivog razvoja.
Metode provjere znanja sa strukturom ocjene:	Ocjena kreativnosti na nastavi i vježbama uz izradu samostalnih radova, ocjena parcijalnog testa u toku nastave kao i ocjena završnog ispita. Kriterijum praćenja rada i ocjenjivanja studenta u toku nastave i to prema sljedećem načinu: – Seminar 15 bodova (%), položeno ako se osvoji preko 50 %.

<table>
<tr><td></td><td>
– I Parcijalni ispit/test/provjera znanja/35 bodova (%), položen je ako se osvoji preko 50 %.
– Završni ispit (II Parcijalni) 50 bodova (%), položeno ako se osvoji preko 50 %.
– Završni ispit (Integralni) 85 bodova (%), položeno ako se osvoji preko 50 %.
Ukupan broj bodova (%) koji student prema navedenom praćenju u toku nastave može ostvariti iznosi maksimalno 50 bodova (%), što sa Završnim (II parcijalnim) čini 100 bodova (%). Za studente koji nisu položili I Parcijalni ispit, Završni ispit (Integralni) se organizuje iz cjelokupnog pređenog gradiva u toku nastave i vježbi, i vrednuje se sa 85 bodova (%), što sa seminarskim radom/praktičnim radom čini 100 bodova (%). Konačan uspjeh studenta nakon svih predviđenih oblika provjere znanja, vrednuje se i ocjenjuje sistemom ocjenjivanja kako slijedi: a) 10 (A) - izuzetan uspjeh bez grešaka ili sa neznatnim greškama, nosi 95-100 bodova; b) 9 (B) - iznad prosjeka, sa ponekom greškom, nosi 85-94 bodova; c) 8 (C) - prosječan, sa primjetnim greškama, nosi 75-84 bodova; d) 7 (D) - općenito dobar, ali sa značajnijim nedostacima, nosi 65-74 bodova; e) 6 (E) - zadovoljava minimalne uslove, nosi 55-64 bodova; f) 5 (F, FX) - ne zadovoljava minimalne uslove, manje od 55 bodova.
Ukupno vrednovanje svih obaveza studenta u toku semestra, odnosno ocjena na ispitu zasnovana je na ukupnom broju bodova (%) koje je student stekao ispunjavanjem predispitnih obaveza i polaganjem parcijalnog i završnog ispita, a prema kvalitetu stečenih znanja i vještina, i sadrži maksimalno 100 bodova, te se utvrđuje prema sljedećoj skali:
<table>
<tr><td>Obaveze studenta</td><td>Bodovi (%)</td></tr>
<tr><td>Prisutnost na predavanjima i vježbama. (obavezno je prisustvu svim oblicima nastave min. 80 % i ovo je uslov za ovjeru/potpis urednog pohađanja)</td><td>0 bodova</td></tr>
<tr><td>Seminar</td><td>15 bodova (%)</td></tr>
<tr><td>I Parcijalni ispit/Test/Provjera znanja/</td><td>35 bodova (%)</td></tr>
<tr><td>Završni ispit (II Parcijalni)</td><td>50 bodova (%)</td></tr>
<tr><td>Završni ispit (Integralni)</td><td>85 bodova (%)</td></tr>
</table>
</td></tr>
<tr><td>Literatura:</td><td>
Obavezna

1. Lindov, O.: Transport i okoliš, univerzitetski udžbenik Fakultet za saobraćaj i komunikacije Sarajevo, 2011.
2. Lindov, O.: Uticaj cestovnih vozila i cestovne infrastrukture na ekološke parametre. Međunarodni naučni skup “Ekološki problemi savremenog saobraćaja”, Sarajevo, 2003.
3. Lindov, O., Omerhodžić A.: Održivi razvoj i okolišni inžinjering. Skripta vježbi i testova, Fakultet za saobraćaj i komunikacije, Sarajevo, 2020.

Dopunska:

1. EC (EvropeanCommission), Directorate General Transport, 1996, Transport Research APAS Road Transport: Assessment of road transport models and systems architectures, VII-31,. ECSCEEC- EAEC, Brussels – Luxembourg.
2. EC (Evropean Commission), Directorate General Transport, 1996, Transport RTD Programme, Summary of Projects resulting from the First Call for Proposals, p.29.
3. Prascevic M.R., Cvetkovic D.S., Stojanovic V.O., (1997), “Mathematical models for describing road traffic noise », Proceedings Inter-Noise 97, Budapest.
4. Pronello C., Iannelli F., 2002. Modelli di previsione del rumore da trafficoincontesti operativi e territorialidifferenti, inCollanaTrasporti, Editore Franco Angeli

</td></tr>
</table>

	5. Pronello C., André M., Pollutant emissions estimation in road transport models, Report INRETSLTE n° 2007, March 2000, BRON Cedex – France, 113 pp. 6. Pronello C., André M., Estimation tool of traffic pollutant emissions in function of macroscopic driving Promjenljive, Report INRETS-LTE, n° 2006, March 2000, BRON Cedex – France, 91 pp.

Šifra predmeta: **03TRTOS020101**	**Naziv predmeta:** **LOGISTIKA I INTELIGENTNI TRANSPORTNI SISTEMI**		
Ciklus: II	**Godina: I**	**Semestar: I**	**Broj ECTS kredita:** 6
Status: Obavezni predmet		**Ukupan broj kontakt sati: 90** Opciono razraditi distribuciju sati po tipu: Predavanja 45 Vježbe 30 Seminar 15	
Učesnici u nastavi	**Nastavnici i saradnici izabrani na oblast kojoj predmet pripada/predmet**		
Preduslov za upis:	NE		
Cilj (ciljevi) predmeta:	Cilj predmeta je usvajanje znanja iz područja primjene inteligentnih transportnih sustava u logističke sustave čime se omogućava digitalizacija logističkih procesa.		
Tematske jedinice: *(po potrebi plan izvođenja po sedmicama se utvrđuje uvažavajući specifičnosti organizacionih jedinica)*	1. Osnovne pretpostavke za razvoj i koncept pametne lgistike 2. Tehnološke faze razvoja logistike 3. Digitalna transformacija logistike 4. Organizacija, planiranje i upravljanje u inteligentnim logističkim sustavima 5. Inteligentni teret i transportna oprema 6. Redizajniranje transportnih i logističkih procesa sustavima ITS-a 7. Pametna skladišta u logistici 8. Napredn ethnologije u logistici 9. Tehnologija proširene stvarnosti u logistici 10. Tehnologija Blockchain u logistici 11. Logistički softverski sustavi 12. Logističke platforme 13. Gradska logistika i ITS 14. Tehnologije umjetne inteligencije i automatske identifikacije u inteligentnoj logistici 15. Budući izazovi digitalne transformacije logistike		
Ishodi učenja:	Znanje: Predmet Inteligentni transportni sustavi i logistika treba osigurati potreban nivo znanja o tehnologijama, funkcijama i učnicima ITS-a u logističkim sustavima koja će omogućiti planiranje razvoj i implementaciju intelihgentnih logističkih sustava i provođenje procesa digitalizacije u logističkim sustavima. Vještine: Predmet inteligentni transportni sistemi i logistika omogućava stjecanje vještina neophodnih za mjerenje, analizu i procjenu učinkovitosti, sigurnosti, utjecaja na okoliš i ekonomskih koristi od		

	implementacije ITS-a u logističke sustave. Kompetencije: Studenti kroz nastavni proces predavanja, vježbe, i seminarski rad trebaju steći odgovarajuće kompetencije za dizajniranje, razvoj i upravljanje logističkim procesima primjenom inteligentnih transportnih sustava.
Cilj održivog razvoja (SDG):	SDG3 – Zdravlje i blagostanje; SDG 9 Industrija, inovacije i infrastruktura , SDG11- Održivi gradovi i zajednce, SDG 12 Održiva potrošnja i proizvodnja, SDG 13-Zaštita klime
Metode izvođenja nastave:	Predavanja, vježbe i seminarski rad.
Metode provjere znanja sa strukturom ocjene:	1. Prisustvo na na nastavi i semiraski rad 15 bodova 2. Prva provjera znanja 35 bodova 3. Završna provjera znanja 50 bodova
Literatura:	Obavezna: 1. Nastavni materijal dostupan na online platformi za učenje Fakulteta za saobraćaj i komunikacije Dopunska: 1. Mac Sullivan, Johannes Kern: The Digital Transformation of Logistics, IEEE Press, New Jersey,2021 2. Rosanna Fornasiero:Next Generation Supply Chains, Springer, Cham, 2021. 3. Albert Tan, Sameer Shukkla : Title: Digital transformation of the supply chain : a practical guide for executives, World Scientific Publishing, London,2021. 4. John M. Longshore and Angela L.: Managing Logistics Systems, Routledge, New York, 2022. 5. Anthony M. Pagano, Matthew Liotine: Technology in Supply Chain Management and Logistics, elsevier, Amsterdam, 2020,

Šifra predmeta: 04TRTOS020101	**Naziv predmeta: PLANIRANJE SAOBRAĆAJNO TRANSPORTNIH SISTEMA U CESTOVNOM SAOBRAĆAJU**		
Ciklus: II	**Godina: I**	**Semestar: I**	**Broj ECTS kredita: 6**
Status: Obavezan predmet		**Ukupan broj sati: 150** Opciono razraditi distribuciju sati po tipu: Predavanja 45 Vježbe 30 Laboratorijske vježbe 15 Seminar 30 Samostalni rad 30	
Učesnici u nastavi	**Nastavnici i saradnici izabrani na oblast kojoj predmet pripada/predmet**		
Preduslov za upis:	Ne		
Cilj (ciljevi) predmeta:	Sticanje edukacijskih oblika u realizaciji programa iz planiranja saobraćajno transportnih sistema. Sticanje znanja i vještina iz planiranja saobraćajni transportnih sistema.		

Tematske jedinice:

(po potrebi plan izvođenja po sedmicama se utvrđuje uvažavajući specifičnosti

R.b.	Nastavne cjeline	Broj sati (P+V+L+S+Sr)
1.	Uvod u planiranje i projektovanje saobraćajno prevoznih sistema	3+2+1+2+2
2.	Saobraćajni i prevozni sistemi	3+2+1+2+2

organizacionih jedinica)	<table><tr><td>3.</td><td>Elementi i obilježja kao osnova za planiranje i projektovanje saobraćajno prevoznih sistema</td><td>3+2+1+2+2</td></tr><tr><td>4.</td><td>Tokovi putnika i roba u mreži saobraćajnica i terminalima</td><td>3+2+1+2+2</td></tr><tr><td>5.</td><td>Istraživanje potražnje i ponude u saobraćaju i prevozu</td><td>2 x (3+2+1+2+2)</td></tr><tr><td>6.</td><td>Analiza stanja u saobraćaju i prevozu</td><td>3+2+1+2+2</td></tr><tr><td>7.</td><td>Metode planiranja potražnje i ponude usluga u saobraćaju i prevozu</td><td>3+2+1+2+2</td></tr><tr><td>9.</td><td>Nove tehnologije u planiranju potražnje i ponude u saobraćaju i prevozu</td><td>3 x (3+2+1+2+2)</td></tr><tr><td>10.</td><td>Planiranje i projektovanje sistema u gradskom saobraćaju i prevozu</td><td>3+2+1+2+2</td></tr><tr><td>11.</td><td>Projektno planiranje u saobraćaju i prevozu</td><td>2 x (3+2+1+2+2)</td></tr><tr><td>12.</td><td>Nove tehnologije u projektnom planiranju</td><td>3+2+1+2+2</td></tr></table>
Ishodi učenja:	Studenti kroz nastavni proces predavanja, vježbi i praktičan rad trebaju steći odgovarajuća znanja vezano za planiranje sistema u saobraćaju i prevozu roba i putnika. Izučavanje i praktična primjena, treba da osigura potreban nivo znanja studentima da mogu uspješno planirati i projektovati saobraćajne i prevozne sistema.
Cilj održivog razvoja (SDG):	Cilj 4: Osigurati inkluzivno i kvalitetno obrazovanje, te promovirati mogućnosti cjeloživotnog učenja za sve ljude, svih životnih dobi Cilj 9: Industrija, inovacije i infrastruktura Cilj 11: Održivi gradovi i zajednice Cilj 12: Održiva potrošnja i proizvodnja Cilj 13: Klimatska akcija
Metode izvođenja nastave:	Predavanja, vježbe i izrada seminarskog rada sa praktičnim osvrtom. Analitički i demonstracioni pristup.
Metode provjere znanja sa strukturom ocjene:	Praćenje rada studenta se vrši dodjeljivanjem bodova za svaki oblik aktivnosti i provjere znanja u toku semestra, kao i na završnom ispitu nakon završetka semestra prema sljedećim elementima praćenja: – Domaća zadaća/seminarski rad/praktični rad/ 15 bodova (%), vrednuje se ako je položeno preko 50 % – I Parcijalni ispit/I test/I provjera znanja/35 bodova (%), vrednuje se ako je položeno preko 50 % – Završni ispit (II Parcijalni) 50 bodova (%), vrednuje se ako je položeno preko 50%. – Završni ispit (Integralni) 85 bodova (%), vrednuje se ako je položeno preko 50%. Ukupan broj bodova (%) koji student prema navedenom praćenju u toku nastave može ostvariti iznosi maksimalno 50 bodova (%), što sa Završnim (II parcijalnim) čini 100 bodova (%). Za studente koji nisu položili I Parcijalni ispit, Završni ispit (Integralni) se organizuje iz cjelokupnog pređenog gradiva u toku nastave i vježbi vrednuje se sa 85 bodova (%), što sa seminarskim radom/praktičnim radom čini 100 bodova (%). Konačan uspjeh studenata nakon svih predviđenih oblika provjere znanja, vrednuje se i ocjenjuje sistemom ocjenjivanja kako slijedi: a) 10 (A) - izuzetan uspjeh bez grešaka ili sa neznatnim greškama, nosi

	95-100 bodova; b) 9 (B) - iznad prosjeka, sa ponekom greškom, nosi 85-94.99 boda; c) 8 (C) - prosječan, sa primjetnim greškama, nosi 75-84,99 boda; d) 7 (D) - općenito dobar, ali sa značajnim nedostacima, nosi 65-74,99 boda; e) 6 (E) - zadovoljava minimalne uslove, nosi 55-64,99 boda; f) 5 (F, FX) - ne zadovoljava minimalne uslove, manje od 55 bodova.
Literatura:	Obavezna: 1. Mehanović, M., 2017. „Planiranje u saobraćaju, prevozu i komunikacijama “. Fakultet za saobraćaj i komunikacije u Sarajevu, Sarajevo. 2. Padjen J.: Osnove prometnog planiranja, Zagreb, 1986. 3. Mehanović, M., 2015. „Mreže u saobraćaju, prevozu i komunikacijama“. Fakultet za saobraćaj i komunikacije u Sarajevu, Sarajevo. Dopunska: 1. Padjen J.: Metode prostorno-prometnog planiranja Ekonomski institut, Zagreb, 1978. 2. Mehanović, M., 2011. „Planiranje ponude usluga u gradskom prometu putnika“. Fakultet za saobraćaj i komunikacije u Sarajevu, Sarajevo. 3. Mehanović, M.: “Zadaci i primjeri iz teorije i prakse u javnom gradskom prevozu putnika”, Fakultet za saobraćaj i komunikacije, Sarajevo, 2005. 4. Meyer, M.D. Miller, E.J.: Urban Transportation Planning, McGraw-Hill, 1984. 5. Kuzović, Lj.; Topolnik, D.: Kapacitet drumskih saobraćajnica, Građevinska knjiga Beograd, 1989. 6. Jovanović N.: Planiranje saobraćaja, Saobraćajni fakultet, Beograd, 1990. 7. Jović J.: Planiranje saobraćaja u gradovima-praktikum, Saobraćajni fakultet, Beograd, 1996. 8. Steierwald, G.; Kűnne, H.D.: *Stadtverkehrs-planung*, Stuttgart, 1993.g. 9. HCM2000*; Capacity Manual*, Special Report 209, Transportation Research Board, Washington D.C., 1994. 10. HZDP Zagreb, Časopisi

Šifra predmeta: 05TRTOS020101	**Naziv predmeta: ORGANIZACIJA I UPRAVLJANJE PRIJEVOZOM PUTNIKA U GRADOVIMA**		
Ciklus: II	**Godina: I**	**Semestar: I**	**Broj ECTS kredita: 6**
Status: Obavezan predmet		**Ukupan broj sati: 90** Opciono razraditi distribuciju sati po tipu: Predavanja 45 Vježbe 30 Laboratorijske vježbe 15 Seminar 30 Samostalni rad 30	
Učesnici u nastavi	**Nastavnici i saradnici izabrani na oblast kojoj predmet pripada/predmet**		
Preduslov za upis:	Ne		

<table>
<tr><td>Cilj (ciljevi) predmeta:</td><td>Sticanje edukacijskih oblika u realizaciji programa iz organizacije i upravljanja u prevozu putnika u gradovima. Sticanje znanja i vještina iz organizacije i upravljanja u prevozu putnika u gradovima.</td></tr>
<tr><td>Tematske jedinice:
(po potrebi plan izvođenja po sedmicama se utvrđuje uvažavajući specifičnosti organizacionih jedinica)</td><td>
<table>
<tr><th>R.b.</th><th>Nastavne cjeline</th><th>Broj sati (P+V+L+S+Sr)</th></tr>
<tr><td>1.</td><td>Prevoza putnika u gradovima i razvoj grada</td><td>2 x (3+2+1+2+2)</td></tr>
<tr><td>2.</td><td>Sistem javnog gradskog prevoza putnika kao objekt upravljanja</td><td>4 x (3+2+1+2+2)</td></tr>
<tr><td>3.</td><td>Planiranje u prevozu putnika u gradovima</td><td>2 x (3+2+1+2+2)</td></tr>
<tr><td>4.</td><td>Organizacija u prevozu putnika u gradovima</td><td>2 x (3+2+1+2+2)</td></tr>
<tr><td>5.</td><td>Ekonomski aspekti prevoza putnika u gradovima</td><td>2 x (3+2+1+2+2)</td></tr>
<tr><td>6.</td><td>Upravljanje prevozom putnika u gradovima</td><td>2 x (3+2+1+2+2)</td></tr>
<tr><td>7.</td><td>Nove tehnologije u prevozu putnika u gradovima</td><td>(3+2+1+2+2)</td></tr>
</table>
</td></tr>
<tr><td>Ishodi učenja:</td><td>Studenti kroz nastavni proces predavanja, vježbi i praktičan rad trebaju steći odgovarajuća znanja vezano za organizaciju i upravljanje u prevozu putnika u gradovima.
Izučavanje i praktična primjena, treba da osigura potreban nivo znanja studentima da mogu uspješno optimalno organizovati i upravljati procesima u prevozu putnika u gradovima.</td></tr>
<tr><td>Cilj održivog razvoja (SDG):</td><td>Cilj 4: Osigurati inkluzivno i kvalitetno obrazovanje, te promovirati mogućnosti cjeloživotnog učenja za sve ljude, svih životnih dobi
Cilj 9: Industrija, inovacije i infrastruktura
Cilj 11: Održivi gradovi i zajednice
Cilj 12: Održiva potrošnja i proizvodnja
Cilj 13: Klimatska akcija</td></tr>
<tr><td>Metode izvođenja nastave:</td><td>Predavanja, vježbe i izrada seminraskog rada sa praktični osvrtom. Analitički i demonstracioni pristup.</td></tr>
<tr><td>Metode provjere znanja sa strukturom ocjene:</td><td>Praćenje rada studenta se vrši dodjeljivanjem bodova za svaki oblik aktivnosti i provjere znanja u toku semestra, kao i na završnom ispitu nakon završetka semestra prema sljedećim elementima praćenja:
– Domaća zadaća/seminarski rad/praktični rad/ 15 bodova (%), vrednuje se ako je položeno preko 50 %
– I Parcijalni ispit/I test/I provjera znanja/35 bodova (%), vrednuje se ako je položeno preko 50 %
– Završni ispit (II Parcijalni) 50 bodova (%), vrednuje se ako je položeno preko 50%.
– Završni ispit (Integralni) 85 bodova (%), vrednuje se ako je položeno preko 50%.
Ukupan broj bodova (%) koji student prema navedenom praćenju u toku nastave može ostvariti iznosi maksimalno 50 bodova (%), što sa Završnim (II parcijalnim) čini 100 bodova (%). Za studente koji nisu položili I Parcijalni ispit, Završni ispit (Integralni) se organizuje iz cjelokupnog pređenog gradiva u toku nastave i vježbi vrednuje se sa 85 bodova (%), što sa seminarskim radom/praktičnim radom čini 100 bodova (%).
Konačan uspjeh studenata nakon svih predviđenih oblika provjere znanja, vrednuje se i ocjenjuje sistemom ocjenjivanja kako slijedi:</td></tr>
</table>

	a) 10 (A) - izuzetan uspjeh bez grešaka ili sa neznatnim greškama, nosi 95-100 bodova; b) 9 (B) - iznad prosjeka, sa ponekom greškom, nosi 85-94.99 boda; c) 8 (C) - prosječan, sa primjetnim greškama, nosi 75-84,99 boda; d) 7 (D) - općenito dobar, ali sa značajnim nedostacima, nosi 65-74,99 boda; e) 6 (E) - zadovoljava minimalne uslove, nosi 55-64,99 boda; f) 5 (F, FX) - ne zadovoljava minimalne uslove, manje od 55 bodova.
Literatura:	Obavezna: 1. Mehanović, M., 2011. „Planiranje ponude usluga u gradskom prometu putnika“. Fakultet za saobraćaj i komunikacije u Sarajevu, Sarajevo. 2. Mehanović, M.: “Zadaci i primjeri iz teorije i prakse u javnom gradskom prevozu putnika”, Fakultet za saobraćaj i komunikacije, Sarajevo, 2005. 3. Banković, R.: Planiranje javnog gradskog putničkog prevoza, IRO Građevinska knjiga, Beograd, 1984. Dopunska: 1. Mehanović, M., 2017. „Planiranje u saobraćaju, prevozu i komunikacijama “. Fakultet za saobraćaj i komunikacije u Sarajevu, Sarajevo. 2. Jović J.: Planiranje saobraćaja u gradovima- praktikum Saobraćajni fakultet, Beograd, 1996. 3. Vučić, V.: Urban Public Transportation, Sistems and Technology, Prentice Hall International England, 1981. 4. HZDP Zagreb, Časopisi

Šifra predmeta: 06TRTOS020102	**Naziv predmeta: INTERMODALNI TRANSPORT**		
Ciklus: II	**Godina: II**	**Semestar: II**	**Broj ECTS kredita: 6**
Status: Obavezni predmet		**Ukupan broj kontakt sati: 90** Opciono razraditi distribuciju sati po tipu: Predavanja: 45 Vježbe: 30 Seminar: 15	
Učesnici u nastavi	**Nastavnici i saradnici izabrani na oblast kojoj predmet pripada/predmet**		
Preduslov za upis:	NE		
Cilj (ciljevi) predmeta:	Nastavna materija koja je obuhvaćena sadržajem, treba da omogući studentima upoznavanje sa savremenim transportnim lancima, osnovama tehnološkog projektovanja i racionalizacije transportnih procesa kao i sa savremanim tehnološkim rješenjima koja se nude u okviru pojedinih tehnologija kombinovanog transporta i uz primjenu principa logistike i mogućnosti koje pružaju nove informacione i telekomunikacijske tehnologije.		
Tematske jedinice: *(po potrebi plan izvođenja po sedmicama se utvrđuje uvažavajući specifičnosti organizacionih jedinica)*	1. Tehnološke promjene; klasični transportni lanac; racionalizacija; savremeni transportni lanac 2. Sistemski pristup analizi transportnog procesa kao složenog tehnološkog sistema 3. Robni tokovi; industrijski transport; tovarne jedinice 4. Paletni sistem transporta, paletni lanac		

	5. Kontejnerski sistem transporta, tipične tehnologije za realizaciju kontejnerskog transportnog lanca 6. Sistem VOZILO-VOZILO 7. Sistem RO-RO transporta, sistem transporta barži riječnog saobraćaja 8. Skladištenje, zalihe, kapacitet skladišta, projektovanje skladišnih sistema 9. Logistika i logistički principi 10. EU transportna politika, evropski koncept intermodalizma 11. Kopneni terminali, ocjena kvaliteta rada terminala, teorija redova 12. Lučki kontejnerski terminali – skladišni platoi u terminalima 13. Komponente logističkih usluga –RTC 14. Elementi savremenog kombinovanog transporta 15. ITS i primjena telematike u savremenom kombinovanom transportu
Ishodi učenja:	Znanje: Studenti će steći temeljno znanje o osnovama intermodalnog transporta, uključujući tehnološke promjene, organizaciju transportnih lanaca i integraciju različitih transportnih modova. Razumjeće ključne principe skladištenja, logistike, kontejnerskih i paletnih sistema, kao i evropsku transportnu politiku s naglaskom na intermodalizam. Vještine: Studeni će razvijati praktične vještine u analizi i optimizaciji transportnih procesa, s naglaskom na korištenje modernih tehnologija kao što su ITS i telematika. Studenti će steći znanja kako efikasno organizirati robne tokove, upravljati terminalima, te koristiti različite transportne sisteme. Kompetencije: Studenti će biti sposobni primijeniti stečena znanja i vještine za upravljanje složenim transportnim lancima, optimizaciju logističkih operacija i integraciju različitih transportnih modova u savremenim industrijskim i komercijalnim okruženjima.
Cilj održivog razvoja (SDG):	SDG7 – Pristupčna energija iz čistih izvora; SDG9 – Industrija, inovacije i infrstruktura; SDG12 – Održiva potrošnja i proizvodnja; SDG17 – Partnerstvom do ciljeva.
Metode izvođenja nastave:	Tokom izvođenja programa nastavnik izlaže pojedine tematske jedinice (ex katedra), omogućava studentima praćenje video zapisa sa edukativnim sadržajem (video prezentacije) iz predmetne oblasti i organizuje diskusije na zadanu temu (interaktivna nastava). U okviru vježbi provodi se razmatranje i rješavanje primjera i zadataka sukladno teoretskoj tematici, pomaže se studentima u samostalnom rješavanju zadataka, u izradi programa i seminarskih radova.
Metode provjere znanja sa strukturom ocjene:	Ocjena aktivnosti na nastavi i vježbama uz izradu samostalnih radova, ocjena parcijalnog testa u toku nastave kao i ocjena završnog ispita. Kriterijum praćenja rada i ocjenjivanja studenta u toku nastave i to prema sljedećem načinu: – Seminarski rad/Terenski rad/Lab.vježbe/Praksa/ (pismena i usmena provjera) 15 bodova (%), položeno ako se osvoji preko 50 %. – I Parcijalni ispit/test/provjera znanja/ (pismena provjera) 35 bodova (%), položen je ako se osvoji preko 50 %. – Završni ispit (II Parcijalni) (pismena provjera) 50 bodova (%), položeno ako se osvoji preko 50 %. – Završni ispit (Integralni) (pismena provjera) 85 bodova (%), položeno ako se osvoji preko 50 %. Ukupan broj bodova (%) koji student prema navedenom praćenju u toku nastave može ostvariti iznosi maksimalno 50 bodova (%), što sa Završnim (II parcijalnim) čini 100 bodova (%). Za studente koji nisu

	položili I Parcijalni ispit, Završni ispit (Integralni) se organizuje iz cjelokupnog pređenog gradiva u toku nastave i vježbi, i vrednuje se sa 85 bodova (%), što sa seminarskim radom/praktičnim radom čini 100 bodova (%). Studenti da bi položili ispit, trebaju položiti svaki od navedenih dijelova i to: seminarski rad, prvi parcijalni ispit (test) i završni ispit (drugi parcijalni ili integralni). Evaluacija seminarskog rada i prvog parcijalnog ispita (testa) se realizira u toku trajanja nastave. Studenti koji polože prvi parcijalni ispit, na završnom ispitu polažu samo drugi parcijalni ispit, dok studenti koji ne polože prvi parcijalni ispit, na završnom ispitu polažu integralni ispit sačinjen iz prvoog i drugog parcijalnog ispita. Studenti ponovci koji u prethodnoj akademskoj godini nisu položili ispit, a koji su ispunili određene obaveze i ostvarili određene bodove, iste mogu prenijeti u tekuću akademsku godinu. Studenti ponovci koji žele izvršiti prenos bodova, trebaju informisati predmetnog nastavnika na početku semestra, do kraja prve sedmice nastave. Prenos bodova se može izvršiti samo jednom. Konačan uspjeh studenta nakon svih predviđenih oblika provjere znanja, vrednuje se i ocjenjuje sistemom ocjenjivanja kako slijedi: a) 10 (A) - izuzetan uspjeh bez grešaka ili sa neznatnim greškama, nosi 95-100 bodova; b) 9 (B) - iznad prosjeka, sa ponekom greškom, nosi 85-94 bodova; c) 8 (C) - prosječan, sa primjetnim greškama, nosi 75-84 bodova; d) 7 (D) - općenito dobar, ali sa značajnijim nedostacima, nosi 65-74 bodova; e) 6 (E) - zadovoljava minimalne uslove, nosi 55-64 bodova; f) 5 (F, FX) - ne zadovoljava minimalne uslove, manje od 55 bodova. Ukupno vrednovanje svih obaveza studenta u toku semestra, odnosno ocjena na ispitu zasnovana je na ukupnom broju bodova (%) koje je student stekao ispunjavanjem predispitnih obaveza i polaganjem parcijalnog i završnog ispita, a prema kvalitetu stečenih znanja i vještina, i sadrži maksimalno 100 bodova, te se utvrđuje prema sljedećoj skali: Obaveze studenta Bodovi (%) Prisutnost na predavanjima i vježbama ..... 0 bodova Obavezno je prisustvo svim oblicima nastave min. 80 % i ovo je uslov za ovjeru/potpis urednog pohađanja nastave. Seminarski rad/Terenski rad/Lab.vježbe/Praksa (pism. i usm.).....15 bodova (%) I Parcijalni ispit (pismeno).....35 bodova (%) Završni ispit (II Parcijalni) (pismeno).....50 bodova (%) Završni ispit (Integralni) (pismeno).....85 bodova (%)
Literatura:	Obavezna: 1. Dalla Chiara B., Ercolani F., Gačanin E., Kiso F.: Intermodalni transport, Education and Culture TEMPUS , Sarajevo 2004. 2. Perišić R.: Savremene strategije i tehnologije razvoja transporta , SANU, Beograd, 2002. 3. Perišić R.: Sistem kvaliteta usluga logistika i informatika, SANU, Beograd, 2002. 4. Terminologija u kombiniranom transportu: UN/ECE, Prevod Kiso F., Education and Culture TEMPUS, Sarajevo, 2004. 5. Kiso, F., Karičić, S., Omerhodžić, A.: Multimodalni transport, Fakultet za saobraćaj i komunikacije, Sarajevo, 2023. Dopunska: 1. Marković I.: Nove tehnologije transporta, Fakultet prometnih znanosti Zagreb, 1985.

	2. Kiso,F.: „Logistika-osnovne postavke“, predavanje skripta, FSK Sarajevo,2019. 3. Kiso,F.:“Skladištenje i teorija zaliha“, predavanje skripta, FSK Sarajevo, 2016.

Šifra predmeta: **07TRTOS020102**	**Naziv predmeta:** **INFORMACIONE TEHNOLOGIJE I ŠPEDITERSKO POSLOVANJE**		
Ciklus: II	**Godina: I**	**Semestar: II**	**Broj ECTS kredita:** 6
Status: Obavezni predmet		**Ukupan broj kontakt sati: 90** Opciono razraditi distribuciju sati po tipu: Predavanja: 45 Vježbe:30 Seminarski i projektni zadatak: 15	
Učesnici u nastavi	**Nastavnici i saradnici izabrani na oblast kojoj predmet pripada/predmet**		
Preduslov za upis:	NE		
Cilj (ciljevi) predmeta:	Upoznavanje sa savremenim informacionim i komunikacijskim tehnologijama koje se primjenjuju u oblasti logističke špedicije, specifičnim softverskim alatima, te metodama i efektima njihove primjene.		
Tematske jedinice: *(po potrebi plan izvođenja po sedmicama se utvrđuje uvažavajući specifičnosti organizacionih jedinica)*	1. Uvod 2. Identifikacija tehnoloških procesa logističke špedicije 3. Identifikacija ključnih interesnih skupina u logističkom špediterskom lancu 4. Teoretske postavke aktuelnih informacionih tehnoloških rješenja koje se primjenjuju u oblasti špedicije 5. Značaj i mogućnosti primjene aplikativnih softvera u upravljanju sistema logističke špedicije i implementacija najboljih praksi 6. Metodološki pristupi u projektovanju informaciono-tehnoloških rješenja u logističkoj špediciji 7. CRM (Customer Relationship Management) u logističko špediterskim kompanijama 8. Planiranje i optimiziranje špediterske usluge- maksimiziranje korisnosti i snižavanje troškova procesa narudžbi, bukiranja i otpreme robe 9. Upravljanje procesima uvoza, izvoza i globalne vanjsko-trgovinske razmjene (harmonizirane tarife, ugovori o vanjskoj trgovini, INCOTERMS) 10. Softverske aplikacije za Business-to-Bussiness SCM (Supply Chain Management) 11. Softverske aplikacije za upravljanje carinskim procedurama bazirane na EU legislativi 12. Softverske aplikacije za upravljanje poslovima skladištenja 13. Softverske aplikacije za upravljanje transportnim lancem 14. Web aplikacije i on-line usluge za vanjskotrgovinsku usklađenost, tarifske klasifikacije, uvozno-izvoznu dokumentaciju, elektronsko izvještavanje, verifikacija 15. Povezivanje segmentiranih softverskih aplikacija u holistički logističko-špediterski informacioni sistem (End-to-End Management)		
Ishodi učenja:	Znanje: Studenti kroz nastavni proces predavanja, vježbe, laboratorijske vježbe i praktičan rad trebaju steći odgovarajuća znanja i vještine za		

	praktičnu primjenu kroz: razvoj IT i evaluaciju efekata njihove primjene u logističkoj špediciji, te samostalnu formulaciju ciljeva istraživanja i primjenu odgovarajućih metoda i modela za njihovu realizaciju Vještine: Sistemski pristup u projektovanju IT poslovnih procesa logističke špedicije i razumijevanje algoritama kao osnove špediterskih softverskih rješenja; identifikaciju i korištenje relevantnih informacionih tehnoloških rješenja iz područja logističke špedicije, kritičku analizu, procjenu i sintezu raspoloživih znanja; razvoj i primjenu špediterskih softverskih upravljačkih modela, te prezentaciju stečenih znanja stručnoj i naučnoj javnosti.planira, upravlja i kontroliše realizaciju različitih tipova projekta u poslovnim sistemima. Kompetencije: Aplikaciju stečenih znanja u konkretnim modelima
Cilj održivog razvoja (SDG):	SDG 4 - Kvalitetno obrazovanje: Osigurati uključivo i kvalitetno obrazovanje, te promovisati mogućnosti cjeloživotnog učenja za sve, SDG 8 - Dostojanstven rad i ekonomski rast: Promovisati održivi, uključivi i održivi ekonomski rast, zapošljavanje i dostojanstven rad za sve, SDG 9 - Industrija, inovacije i infrastruktura: Izgraditi otpornu infrastrukturu, promovirati uključivu i održivu industrializaciju i poticati inovacije, SDG 12 - Odgovorna potrošnja i proizvodnja: Osigurati održive obrasce potrošnje i proizvodnje, SDG 16 - Mir, pravda i snažne institucije: Promovisati mirne i uključive društva za održivi razvoj, osigurati pristup pravdi za sve i izgraditi efikasne, odgovorne i uključive institucije na svim nivoima
Metode izvođenja nastave:	Tokom izvođenja programa nastavnik izlaže pojedine tematske jedinice (ex katedra), omogućava studentima praćenje video zapisa sa edukativnim sadržajem (DVD, video prezentacije) iz predmetne oblasti i organizuje diskusije na zadanu temu (interaktivna nastava). U okviru vježbi provodi se razmatranje i rješavanje primjera i zadataka sukladno teoretskoj tematici, pomaže se studentima u samostalnom rješavanju zadataka, u izradi programa, projekata i seminarskih radova.
Metode provjere znanja sa strukturom ocjene:	Kriterijum vrednovanja rada i ocjenjivanja studenta u toku nastave, vrši se na sljedeći način: Seminarski rad / projektni zadatak: od 0 do 15 bodova, položeno ako se osvoji preko 50% I test / I provjera znanja / I parcijalni ispit: od 0 do 35 bodova, položeno ako se osvoji preko 50% Završni ispit – pismeni 20 bodova Završni ispit – usmeni 30 bodova Završni ispit (Inegralni) – pismeni - 40 bodova Završni ispit (Inegralni) – usmeni – 45 bodova Da bi student položio ispit mora položiti usmeni dio ispita. Ukupan broj bodova koji studenta može ostvariti u toku nastave može iznosi maksimalno 50 bodova. Završni ispit uključuje gradivo koje student nije položio na parcijalnom ispitu što znači da obuhvata drugi dio gradiva (II parcijalni) koji se vrednuje sa 50 bodova ili se sastoji od kompletnog gradiva, tj. I i II parcijalnog ispita. Ukupno vrednovanje svih obaveza studenta u toku semestra, odnosno ocjena na ispitu zasnovana je na ukupnom broju bodova (%) koje je student stekao ispunjavanjem predispitnih obaveza, polaganjem parcijalnog i završnog ispita. Prema kvalitetu stečenih znanja i vještina student može osvojiti maksimalno 100 bodova, a prema sljedećoj skali: Struktura bodovanja Bodovi (%)

	Seminarski / Projektni zadatak:..... 15 bodova (%) I test / I provjera znanja (I parcijalni ispit):.....35 bodova (%) Završni (II parcijalni ispit):.....50 bodova (%) Potreban uslov za uspješno okončan ispit je postignut rezultat od 55 bodova pri čemu na svakom dijelu ispita treba ostvariti minimalno 50% (aktivnost, parcijalni ispit, završni ispit-pismeni), tj. da bi student položio ispit mora ostvariti sljedeće uslove: - Aktivnost (seminarski rad / projektni zadatak): 7,5 bodova - I test / I provjera znanja / parcijalni ispit: 17,5 bodova - Završni ispit (II parcijalni ispit) – pismeni dio: 10 bodova Studenti koji su položili parcijalni ispit, na završnom ispitu polažu samo drugi dio gradiva (dio koji nije obuhvaćen parcijalnim ispitom). Studenti koji nisu položili parcijalni ispit, u okviru završnog ispita polažu kompletno gradivo, pri čemu kriteriji za polaganje ispita ostaje identični. Završni ispit se organizuje kao pismeni i/ili usmeni. Aktivnost se može pratiti kroz izradu zadaće, seminarskih radova, projektnih zadataka ili polaganje kvizova. Napomena: Studenti su obavezni prisustvovati svim oblicima nastave minimalno 80 % od ukupnog fonda sati i prisustvo na nastavi je uslov za ovjeru urednog pohađanja nastave. Student može, u opravdanim slučajevima (bolest) odsustvovati sa nastave, za što je obavezan dostaviti zdrastveno opravdanje. Seminarski rad i domaća zadaća će biti bodovane samo ako budu predane prema definisanim terminima. Naknadne predaje istih neće se bodovati. Konačan uspjeh studenta nakon svih predviđenih oblika provjere znanja, vrednuje se i ocjenjuje sistemom ocjenjivanja kako slijedi: a) 10 - izuzetan uspjeh bez grešaka ili sa neznatnim greškama, nosi 95-100 bodova; b) 9 - iznad prosjeka, sa ponekom greškom, nosi 85-94 bodova; c) 8 - prosječan, sa primjetnim greškama, nosi 75-84 bodova; d) 7 - općenito dobar, ali sa značajnijim nedostacima, nosi 65-74 bodova; e) 6 - zadovoljava minimalne uslove, nosi 55-64 bodova; f) 5 - ne zadovoljava minimalne uslove, manje od 55 bodova
Literatura:	Obavezna: 1. R. Zelenika: Logistička špedicija, Ekonomski fakultet, Zagreb, 2000. 2. Zelenika, R.: Logistički sustavi, Ekonomski fakultet u Rijeci, 2005.; 3. Gordana M. Radivojević, Upravljanje informacijama u logistici. Beograd 2023. 4. Ivanković, Č.: Špedicija i logistika, Fakultet prometnih znanosti, Zagreb, 2005. 5. R. Zelenika: Međunarodna špedicija, Ekonomski fakultet, Zagreb, 1996. 6. Deljanin: Logistika u saobraćaju i komunikacijama, Skripta, FSK, 2013. 7. Deljanin: Logistički sistemi, Skripta, FSK, 2014. Dopunska: 1. Andrijanić I., Aržek Z., Prebežac D., Zelenika R., Transportno i špeditersko poslovanje, Zagreb, 2001. 2. Z. Aržek, G. Badovinac: Transport i osiguranje, Izdavačko-instruktivni biro, Zagreb, 1986. 3. J. Mađarić: Međunarodna špedicija, Fakultet prometnih znanosti, Zagreb, 1991.

	4. Grabovac: Odgovornost poduzetnika multimodalnog prijevoza stvari, Prometni fakultet, Split, 1986. 5. Shipping and logistics management, Y H V Lun; Kee-hung Lai; T C E Cheng Publisher: New York; London : Springer, 2010. 6. International logistics supply chain outsourcing: from local to global, Alan Rushton; Steve WalkerPublisher:London : Kogan Page, 2007. 7. Transportation Management with SAP TM, Bernd Lauterbach, Stefan Sauer, Jens Kappauf, Jens Gottlieb, Dominik Metzger, Christopher Sürie, 2nd, updated and revised edition 2016. 8. Warehouse Management with SAP EWM, Balaji Kannapan, Hari Tripathy, Vinay Krishna, 2nd, updated and revised edition 2016. ČASOPISI – International Journal of Phisical Distribution, – Computers and Operation Research – International Journal of Information Management – European Journal of Operational Research – Journal of Bussines Logistics

Šifra predmeta: 08TRTOS020102	**Naziv predmeta: PLANIRANJE I KAPACITETI CESTOVNIH SAOBRAĆAJNICA**		
Ciklus: II	**Godina: I**	**Semestar: II**	**Broj ECTS kredita: 6**
Status: Obavezni predmet		**Ukupan broj kontakt sati:** 90 Predavanja 45 Vježbe 30 Seminar 15	
Učesnici u nastavi	**Nastavnici i saradnici izabrani na oblast kojoj predmet pripada/predmet**		
Preduslov za upis:	Obavezno je prisustvo i aktivnost na predavanjima i vježbama, te izrada seminarskog rada i zadataka za samostalne vježbe		
Cilj (ciljevi) predmeta:	Nastavna materija koja je obuhvaćena sadržajem, treba da omogući studentima upoznavanje sa karakteristikama cestovne mreže sa aspekta planiranja, dimenzionisanja i upravljanja.Detaljno upoznavanje sa procedurama saobraćajno-tehničkog proračuna za pojedine segmente saobraćajne mreže.		
Tematske jedinice: *(po potrebi plan izvođenja po sedmicama se utvrđuje uvažavajući specifičnosti organizacionih jedinica)*	1. Zadatak i cilj izrade saobraćajno tehničkog proračuna u različitim fazama i uslovima planiranja i eksploatacije saobraćajne mreže 2. Kapacitet saobraćajne dionice puta 3. Praktični kapacitet autoputa 4. Kapacitet dvotračnih puteva za dvosmjerni saobraćaj, višetračnih puteva i puteva sa tri saobraćajne trake za dvosmjerni saobraćaj 5. Nivo saobraćajne usluge za dionice puteva 6. Propusna moć rampi i spojeva rampi 7. Zone preplitanja 8. Površinske raskrsnice, klasifikacija, oblikovanje, tehnički elementi 9. Kapacitet i nivo usluge signalisanih čvorišta 10. Kapacitet i nivo usluge saobraćajnih čvorišta bez svjetlosne signalizacije 11. Kapacitet kružnih raskrsnica 12. Gradske i prigradske arterije 13. Kapacitet i nivo usluge za javni putnički prijevoz na uličnoj površini 14. Pješački tokovi i objekti pješačkog saobraćaja		

	15. Biciklistički tokovi, metodološki pristup i metode definisanja biciklističkih staza.
Ishodi učenja:	Studenti kroz nastavni proces predavanja, vježbe i praktičan rad trebaju steći odgovarajuća znanja i iskustva za praktičnu primjenu u oblasti cestovnih saobraćajnica, kao veoma značajnog i prostorno zahtjevnog segmenta gradskog saobraćajnog sistema. Predmet Planiranje i kapacitet cestovnih saobraćajnica treba da osigura potreban nivo znanja o pravilima, metodama i postupcima planiranja i projektovanja slobodnih putnih dionica, saobraćajnih čvorišta, kao i cestovne mreže u odgovarajućem prostornom obuhvatu. Također predmet omogućava sticanje znanja i vještina neophodnih za adekvatnu kontrolu i upravljanje u cestovnom saobraćaju.
Cilj održivog razvoja (SDG):	– SDG 9: Industrija, inovacije i infrastruktura – SDG 11: Održivi gradovi i zajednice – SDG 13: Klimatske promjene
Metode izvođenja nastave:	Nastava se realizira kroz izvođenje predavanja, vježbi i praktičnog dijela nastave koja uključuje izradu projektnih zadataka. Predavanja se realizuju kroz usmeno izlaganje sa prezentacijom i prikazom primjera iz prakse. Inicira diskusija o problemima u oblasti planiranja i projektovanja saobraćajne infrastrukture. Studenti će biti obavezni izraditi i prezentirati seminarske radove i/ili projektne zadatake. U realizaciji nastave se koriste različite metode koje uključuju: usmeno izlaganje i diskusije, demonstracije primjera, metoda grafičkih i video prikaza i potenciranje rada u grupama primjenom odgovarajućih metodoloških pristupa.
Metode provjere znanja sa strukturom ocjene:	Kriterijum vrednovanja rada i ocjenjivanja studenta u toku nastave, vrši se na sljedeći način: Prisustvo nastavi i vježbama će se voditi, prisustvo nastavi obavezno kao uslov za dobivanje potpisa i ovjeru semestra uz max. 20% izostanaka bez opravdanja. Redovno prisustvo se neće dodatno bodovati. Potpis nije uslovljen prisustvom na nastavi.Domaća zadaća/seminarski rad/praktični rad/ od 0 do 15 bodova, a ocijeniti će se samo oni studenti koji su zadovoljili preko 50 % od navedenih obaveza; U toku nastave će se organizovati samo jedna provjera znanja - Parcijalni ispit u 7 ili 8 sedmici nastave sa vrednovanjem od 35 bodova, stim da će se bodovati samo oni studenti koji su položili preko 50 % od navedenog parcijalnog ispita.Završni ispit iznosi maksimalno 50 bodova.
Literatura:	Obavezna: 1. Kuzović, Lj.:“Kapacitet i nivo usluge drumskih saobraćajnica“,Univerzitet u Beogradu, 2000. 2. Kiso, F.:“Kapacitet raskrsnica“, Univerzitet u Sarajevu Fakultet za saobraćaj i komunikacije, Sarajevo, 2010. 3. Kuzović, Lj.:“Utvrđivanje potreba i opravdanosti izdvajanja tranzitnog saobraćaja sa gradskih arterija izgradnjom obilaznica“, Univerzitet u Beogradu, 1997. 4. Kuzović, Lj.:“Vrednovanje u upravljanju razvojem i eksploatacijom putne mreže“,Univerzitet u Beogradu, 1994. 5. Highway Capacity Manual-HCM,2000. 6. Tubić, V.:“Zbirka rješenih zadataka iz kapaciteta i NU drumskih saobraćajnica“, Univerzitet u Beogradu, 2000. 7. Vukanović, S.:“Kružne raskrsnice“, Univerzitet u Beogradu Saobraćajni fakultet, 1994. 8. Kiso,F.,Deljanin,A.:“Metode vrednovanja u planiranju i projektovanju saobraćajne infrastrukture“, Univerzitet u sarajevu, 2017.

Šifra predmeta: 11TRTOS020203	Naziv predmeta: METODE VREDNOVANJA I ODLUČIVANJA U SAOBRAĆAJNOM PROJEKTOVANJU		
Ciklus: II (drugi)	**Godina: II (druga)**	**Semestar: III (treći)**	**Broj ECTS kredita: 6 (šest)**
Status: Izborni predmet		**Ukupan broj kontakt sati: 90** Predavanja 45 Vježbe 30 Seminar 15	
Učesnici u nastavi	**Nastavnici i saradnici izabrani na oblast kojoj predmet pripada/predmet**		
Preduslov za upis:	Ne		
Cilj (ciljevi) predmeta:	Nastavna materija koja je obuhvaćena sadržajem, treba da omogući studentima upoznavanje sa osnovama planiranja i projektovanja saobraćajne infrastrukture, vrstama vrednovanja u postupku planiranja i projektovanja. Cilj predmeta je također izučavanje najznačajnijih i najčešće primjenjivanih metoda vrednovanja u procesu saobraćajnog planiranja i projektovanja. Nastavna materija obuhvata metode invensticionog, ekološkog i društveno-ekonomskog vrednovanja kao i metode višekriterijumske analize sa aplikativnim primjerima i smjernicama za upoznavanje procesa odlučivanja u saobraćajnom projektovanju.		
Tematske jedinice: *(po potrebi plan izvođenja po sedmicama se utvrđuje uvažavajući specifičnosti organizacionih jedinica)*	– Saobraćajni sistem kao faktor prostorne organizacije i razmještaja – Metodološki pristup saobraćajnom planiranju – Osnove procesa planiranja saobraćajnica – Osnove projektovanja saobraćajnica – Teorijske pretpostavke planiranja i projektovanja saobraćajne infrastrukture – Studija opravdanosti – CB analiza – Funkcionalno vrednovanje projektnih rješenja – Funkcionalno vrednovanje cestovnih dionica – Finansijska i ekonomska analiza projekata – Analiza troškova i koristi kod saobraćajnih projekata – Višekriterijumsko vrednovanje i metode odlučivanja – Ekološko vrednovanje utjecaja infrastrukture na životnu sredinu – Upravljanje projektima saobraćajne infrastrukture – Tehnike upravljanja projektom – Priprema projekata finansiranih iz EU fondova		
Ishodi učenja:	Studenti kroz nastavni proces predavanja, vježbe i praktičan rad trebaju steći odgovarajuća znanja i iskustva za praktičnu primjenu u oblasti planiranja i projektovanja saobraćajne infrastrukture. Također predmet omogućava stjecanje znanja i vještina neophodnih za vrednovanje planskih i projektnih rješenja i na osnovu toga donošenje adekvatnih odluka.		
Cilj održivog razvoja (SDG):	SDG 8: Dostojanstven rad i ekonomski rast SDG 9: Industrija, inovacije i infrastruktura SDG 11: Održivi gradovi i zajednice SDG 13: Klimatske promjene SDG 17: Partnerstva za ciljeve		
Metode izvođenja nastave:	Nastava se realizira kroz izvođenje predavanja, vježbi i praktičnog dijela nastave koja uključuje izradu projektnih zadataka. Predavanja se realizuju kroz usmeno izlaganje sa prezentacijom i prikazom primjera iz		

	prakse. Inicira diskusija o problemima u oblasti planiranja i projektovanja saobraćajne infrastrukture. Studenti će biti obavezni izraditi i prezentirati seminarske radove i/ili projektne zadatake. U realizaciji nastave se koriste različite metode koje uključuju: usmeno izlaganje i diskusije, demonstracije primjera, metoda grafičkih i video prikaza i potenciranje rada u grupama primjenom odgovarajućih metodoloških pristupa.
Metode provjere znanja sa strukturom ocjene:	Kriterijum vrednovanja rada i ocjenjivanja studenta u toku nastave, vrši se na sljedeći način: Prisustvo nastavi i vježbama će se voditi, prisustvo nastavi obavezno kao uslov za polaganje ispita uz max. 10% izostanaka bez opravdanja. Redovno prisustvo se neće dodatno bodovati. Potpis nije uslovljen prisustvom na nastavi. Domaća zadaća/seminarski rad/praktični rad/ od 0 do 15 bodova, a ocijeniti će se samo oni studenti koji su zadovoljili preko 50 % od navedenih obaveza; U toku nastave će se organizovati samo jedna provjera znanja - Parcijalni ispit u 7 ili 8 sedmici nastave sa vrednovanjem od 35 bodova, s tim da će se bodovati samo oni studenti koji su položili preko 50 % od navedenog parcijalnog ispita. Završni ispit iznosi maksimalno 50 bodova.
Literatura:	Obavezna: 1. Jovanović, N.:"Planiranje saobraćaja", Saobraćajni fakultet Univerziteta u Beogradu, 1990. 2. Kuzović, Lj.:"Vrednovanje u upravljanju i razvojem i eksploatacijom putne mreže", Saobraćajni fakultet Univerziteta u Beogradu, 1994. 3. Milosavljević, N.:"Elementi za tehnološko projektovanje objekata u cestovnom saobraćaju i transportu", Univerzitet u Beogradu, 1998. 4. Kuzović, Lj.:"Utvrđivanje potreba i opravdanosti izdvajanja tranzitnog saobraćaja sa gradskih arterija izgradnjom obilaznica", Univerzitet u Beogradu, 1997. 5. Highway Capacity Manual – HCM 1994 / HCM 2000 6. Kiso, F., Deljanin,A.: "Metode vrednovanja u planiranju i projektovanju saobraćajne infrastrukture", Fakultet za saobraćaj i komunikacije Univerziteta u Sarajevu, 2017.

Šifra predmeta: 12TRTOS020203	**Naziv predmeta: ELEMENTI SIGURNOSTI CESTA**		
Ciklus: II	**Godina: II**	**Semestar: III**	**Broj ECTS kredita: 6**
Status: Obavezni predmet		**Ukupan broj sati: 90** Razraditi distribuciju sati po tipu: Predavanja: 30, Vježbe: 30, Seminar: 10, Terenski rad: 10, Laboratorijske vježbe: 5, Praksa: 5.	
Učesnici u nastavi	**Nastavnici i saradnici izabrani na oblast kojoj predmet pripada/predmet**		
Preduslov za upis:	NE		
Cilj (ciljevi) predmeta:	Sticanje edukacijskih oblika u realizaciji programa iz oblasti elemenata sigurnosti cesta, te praktičnim analizama, elaboratima, projektima u oblasti sigurnosti cesta i cestovne infrastrukture.		
Tematske jedinice: *(po potrebi plan izvođenja po sedmicama se utvrđuje uvažavajući specifičnosti organizacionih jedinica)*	1. Uvod – osnove elemenata sigurnosti cesta 2. Zakon o osnovama sigurnosti saobraćaja na putevima u BiH i pravilnici 3. Zakon o cestama i pravilnici 4. Parametri ceste i saobraćajna signalizacija i oprema ceste		

	5. Vrsta i sadržaj projekata za građenje i rekonstrukciju cesta 6. Pravilnik o osnovnim uvjetima koje javne ceste, njihovi elementi i objekti na njima moraju ispunjavati sa aspekta sigurnosti saobraćaja; Smjernice; Set uputa autoceste 7. EU i BH standardi - saobraćajna signalizacija i oprema 8. Revizija projekata saobraćajne signalizacije i opreme ceste 9. Tehnički prijem cesta 10. RSA i RSI – revizija i inspekcija sigurnosti cesta 11. EuroRAP 12. Značaj i mogućnosti zaštitnih ograda u smanjenu izlijetanja vozila 13. Upravljanje crnim tačkama na cestovnoj mreži 14. Analiza crne tačke (terensko istraživanje) 15. Regulacija saobraćaja u zoni izvođenja radova
Ishodi učenja:	Znanje: Teorijska i praktična znanja iz oblasti sigurnosti cesta. Osnovni propisi, pravila, metode i postupci u oblasti sigurnosti cesta i cestovne infrastrukutre. Vještine: Sposobnost primjene teorijskih i praktičnih znanja u oblasti sigurnosti cesta i cestovne infrastrukture u funkciji upravljanja cestovnom mrežom. Kompetencije: Sposobnosti samostalnog razumijevanja i korištenja propisa, korištenja stručne literature, primjene metoda i postupaka, mjerenja i istraživanja, korištenje softverskih alata, korištenje mjernih uređaja i opreme, izrada analiza, i praktičnih rješenja u procesu planiranja, projektovanja, izgradnje, nadzora, održavanja i upravljanja mrežom cesta i cestovnom infrastrukturom.
Cilj održivog razvoja (SDG):	"SDG3 – Zdravlje i blagostanje"; "SDG9 – Industrija, inovacije i infrstruktura"; "SDG11 – Održivi gradovi i zajednice"; "SDG12 – Održiva pottrošnja i proizvodnja".
Metode izvođenja nastave:	Usmeno iznošenje sa prezentacijom i prikazom različitih metoda i procesa iz oblasti sigurnosti cesta uz korištenje video i audio zapisa, te samostalno izlaganje pojedinih konkretnih problema na saobraćajnicama na konkretnom području istraživanja. Iniciranje rasprava i diskusija o problemima iz prakse, pojedinačnih zapažanja iz različitih okruženja, izrada samostalnih projekata iz oblasti sigurnosti cesta.
Metode provjere znanja sa strukturom ocjene:	Ocjena aktivnosti na nastavi i vježbama uz izradu samostalnih radova, ocjena parcijalnog testa u toku nastave kao i ocjena završnog ispita. Kriterijum praćenja rada i ocjenjivanja studenta u toku nastave i to prema sljedećem načinu: – Seminarski rad/Terenski rad/Lab.vježbe/Praksa/ (pismena i usmena provjera) 15 bodova (%), položeno ako se osvoji preko 50 %. – I Parcijalni ispit/test/provjera znanja/ (pismena provjera) 35 bodova (%), položen je ako se osvoji preko 50 %. – Završni ispit (II Parcijalni) (pismena provjera) 50 bodova (%), položeno ako se osvoji preko 50 %. – Završni ispit (Integralni) (pismena provjera) 85 bodova (%), položeno ako se osvoji preko 50 %. Ukupan broj bodova (%) koji student prema navedenom praćenju u toku nastave može ostvariti iznosi maksimalno 50 bodova (%), što sa Završnim (II parcijalnim) čini 100 bodova (%). Za studente koji nisu položili I Parcijalni ispit, Završni ispit (Integralni) se organizuje iz cjelokupnog pređenog gradiva u toku nastave i vježbi, i vrednuje se sa 85 bodova (%), što sa seminarskim radom/praktičnim radom čini 100 bodova (%).

	Studenti da bi položili ispit, trebaju položiti svaki od navedenih dijelova i to: seminarski rad, prvi parcijalni ispit (test) i završni ispit (drugi parcijalni ili integralni). Evaluacija seminarskog rada i prvog parcijalnog ispita (testa) se realizira u toku trajanja nastave. Studenti ponovci koji u prethodnoj akademskoj godini nisu položili ispit, a koji su ispunili određene obaveze i ostvarili određene bodove, iste mogu prenijeti u tekuću akademsku godinu. Studenti ponovci koji žele izvršiti prenos bodova, trebaju informisati predmetnog nastavnika na početku semestra, do kraja prve sedmice nastave. Prenos bodova se može izvršiti samo jednom. Konačan uspjeh studenta nakon svih predviđenih oblika provjere znanja, vrednuje se i ocjenjuje sistemom ocjenjivanja kako slijedi: a) 10 (A) - izuzetan uspjeh bez grešaka ili sa neznatnim greškama, nosi 95-100 bodova; b) 9 (B) - iznad prosjeka, sa ponekom greškom, nosi 85-94 bodova; c) 8 (C) - prosječan, sa primjetnim greškama, nosi 75-84 bodova; d) 7 (D) - općenito dobar, ali sa značajnijim nedostacima, nosi 65-74 bodova; e) 6 (E) - zadovoljava minimalne uslove, nosi 55-64 bodova; f) 5 (F, FX) - ne zadovoljava minimalne uslove, manje od 55 bodova. Ukupno vrednovanje svih obaveza studenta u toku semestra, odnosno ocjena na ispitu zasnovana je na ukupnom broju bodova (%) koje je student stekao ispunjavanjem predispitnih obaveza i polaganjem parcijalnog i završnog ispita, a prema kvalitetu stečenih znanja i vještina, i sadrži maksimalno 100 bodova, te se utvrđuje prema sljedećoj skali: Obaveze studenta Bodovi (%) Prisutnost na predavanjima i vježbama ..... 0 bodova Obavezno je prisustvo svim oblicima nastave min. 80 % i ovo je uslov za ovjeru/potpis urednog pohađanja nastave. Seminarski rad/Terenski rad/Lab.vježbe/Praksa (pism. i usm.)...15 bodova (%) I Parcijalni ispit/Test/Provjera znanja (pismeno).....35 bodova (%) Završni ispit (II Parcijalni) (pismeno) .....50 bodova (%) Završni ispit (Integralni) (pismeno).....85 bodova (%)
Literatura:	Obavezna: 1. Lindov, O.: Sigurnost u cestovnom saobraćaju, Univerzitetski udžbenik, Fakultet za saobraćaj i komunikacije, Sarajevo, 2008. 2. Lindov, O., Omerhodžić A.: Elementi sigurnosti cesta. Skripta predavanja, Fakultet za saobraćaj i komunikacije, Sarajevo, 2015. 3. Lindov, O., Kalajdžić, E., Omerbegović, H.: Stručni i pravni dio projektovanja - oblast saobraćaj- stručni ispit - cestovni saobraćaj - Udruženje inženjera saobraćaja i komunikacija u Bosni i Hercegovini, Sarajevo, BiH, 2013. 4. Lindov, O., Priručnik za jačanje kapaciteta profesije bezbjednosti saobraćaja, Fakultet za saobraćaj i komunikacije Univeziteta u Sarajevu, Erasmus+ projekat Trafsaf, Sarajevo, 2020. 5. Direktiva 2008/96/EC Europskog Parlamenta i Vijeća od 19. novembra 2008. godine o sigurnosti cestovne infrastrukture 6. Priručnik za reviziju cestovne sigurnosti za SEETO članice 7. Priručnik za inspekciju cestovne sigurnosti za SEETO članice 8. Smjernice za projektovanje, građenje, održavanje i nadzor na putevima, Sarajevo, Banja Luka, 2005. 9. ZOBS, pravilnici, standardi, Ministarstvo komunikacija i prometa, BiH.

	10. Zdravković, P., Stanić, B., Vukanović, S., Milosavljević, S.: Elementi saobraćajnog projektovanja: Vertikalna signalizacija, Saobraćajni fakultet Univerziteta u Beogradu, Beograd, 2003. 11. Zdravković, P., Stanić, B., Vukanović, S., Milosavljević, S.: Elementi saobraćajnog projektovanja: Horizontalna signalizacija, Saobraćajni fakultet Univerziteta u Beogradu, Beograd, 2003. Dopunska: 1. Milojčić, D., Jovanov, D., Lipovac, Krsto, Branković, R.: Prva iskustva u primjeni RSA (Road Safety Audit) u Srbiji - studija slučaja, Zbornik radova, Sarajevo, 2008. 2. Elvik, R.: Road safety inspections and best practice guidelines, Oslo, 2006. 3. Lindov, O.: Transport i okoliš, Fakultet za saobraćaj i komunikacije, Univerzitetski udžbenik, Sarajevo, 2011. 4. Regionalna strategija sigurnosti cestovnog saobraćaja (RRSS) za SEETO članice 5. Road Safety Audit Guidelines, NRA National Roads Authority, Dublin, 2004. 6. Safety audit procedures for existing roads, Transfund New Zealand, Wellington 1998. 7. Morgan, R., J. Epstein, P. Jordan, G. Lee, and R. Lathlean. Road Safety Audit Guide

Šifra predmeta: **09-10-1TRTES020102**	**Naziv predmeta:** **UPRAVLJANJE I ORGANIZACIJA STACIONARNOG SAOBRAĆAJA**		
Ciklus: II	**Godina: I**	**Semestar: II**	**Broj ECTS kredita: 6**
Status: Izborni predmet		**Ukupan broj sati: 90** Opciono razraditi distribuciju sati po tipu: Predavanja 45 Vježbe 30 Laboratorijske vježbe 15	
Učesnici u nastavi	**Nastavnici i saradnici izabrani na oblast kojoj predmet pripada/predmet**		
Preduslov za upis:	Ne		
Cilj (ciljevi) predmeta:	Sticanje edukacijskih oblika u realizaciji programa iz sistema upravljanja i organizacije stacionarnog saobraćaja, te praktične analize, elaborati i projekti iz oblasti stacionarnog saobraćaja.		

Tematske jedinice:

(po potrebi plan izvođenja po sedmicama se utvrđuje uvažavajući specifičnosti organizacionih jedinica)

R.b.	Nastavne cjeline	Broj sati (P+V+L)
1.	Uvod – osnovni pojmovi iz oblasti stacionarnog saobraćaja	(3+2+1)
2.	Prostorno i urbanističko planiranje i stacionarni saobraćaj	(3+2+1)
3.	Razvoj mirujućeg saobraćaja i nastajanje potrebe za parkiranjem	(3+2+1)
4.	Elementi parkiranja. Elementi parkirališta	(3+2+1)
5.	Fizičke karakteristike parkirališta i tehnološki zahtjevi sistema organizacije	(3+2+1)
6.	Planiranje i tipovi istraživanja potreba za parking prostorom	(3+2+1)
7.	Kapacitet mirujućeg saobraćaja	(3+2+1)

	8. Osnovne faze i elementi izrade projektne dokumentacije za parkirališta i parking garaže (3+2+1) 9. Kontrola, upravljanje i organizacija stacionarnog saobraćaja (3+2+1) 10. Horizontalna i vertikalna signalizacija u stacionarnom saobraćaju (3+2+1) 11. Mjere saobraćajne politike i ekonomski aspekti stacionarnog saobraćaja (3+2+1) 12. Gradska parkirališna i prometno prekršajna politika – Zakonska regulativa (3+2+1) 13. Softverska rješenja upravljanja parkiralištima (3+2+1) 14. Javno-privatno partnerstvo, potencijali i prijetnje u stacionarnom saobraćaju (3+2+1) 15. Uticaj sistema parkiranja s ciljem optimizacije čovjekove sredine (3+2+1)
Ishodi učenja:	Studenti kroz nastavni proces predavanja, vježbe, praktične vježbe i praktičan rad trebaju steći odgovarajuća znanja i iskustva za praktičnu primjenu u stacionarnom saobraćaju sa fokusom na elemente parkirališta i cestovnih terminala. Kroz materiju predmeta potrebno je osigurati nivo znanja o pravilima, metodama i normativima u stacionarnom saobraćaju. Predmet omogućava sticanje znanja i vještina neophodnih za adekvatnu analizu, procjenu i upravljanju stacionarnim saobraćajem sa ekonomskog i sigurnosnog aspekta.
Cilj održivog razvoja (SDG):	Cilj 9: Izgraditi izdržljivu infrastrukturu, promovirati uključivu i održivu industrijalizaciju i poticati inovativnost Cilj 11: Učiniti gradove i naselja inkluzivnim, sigurnim, prilagodljivim i održivim Cilj 13: Poduzeti hitne akcije u borbi protiv klimatskih promjena i njihovih posljedica
Metode izvođenja nastave:	Predavanja, vježbe i izrada seminarskog rada sa praktičnim osvrtom.
Metode provjere znanja sa strukturom ocjene:	Kriterijum vrednovanja rada i ocjenjivanja studenta u toku nastave, vrši se na sljedeći način: Prisustvo nastavi i vježbama od 0 – 10 bodova (%); Domaća zadaća/seminarski rad/praktični rad/ od 0 do 10 bodova (%);I parcijalni ispit/I test/ I provjera znanja/ od 0 do 15 bodova (%);II parcijalni ispit/II test/ II provjera znanja / od 0 do 20 bodova (%). Ukupan broj bodova (%) koji studenta prema navedenom praćenju u toku nastave može ostvariti iznosi maksimalno 55 bodova (%). Završni ispit iznosi najviše 45 bodova odnosno 45 (%). Završni ispit se organizuje iz cjelokupnog pređenog gradiva u toku nastave.
Literatura:	Obavezna: 1. Brčić, D.; Šoštarić, M.Parkiranje i garaže, Fakultet prometnih znanosti, Zagreb 2012. 2. Tomić, Milovan, 1995, Parkiranje i parkirališta – Stacionarni saobraćaj, Saobraćajni fakultet univerziteta u Beogradu. 3. Putnik, Nikola, 2001, Autobaze i autostanice, Saobraćajni fakultet univerziteta u Beogradu 4. Mehanović, Mustafa, Planiranje ponude usluga u gradskom prometu putnika, Fakultet za saobraćaj i komunikacije, Sarajevo, 2011. Dopunska: 1. Studija saobraćaja na području Kantona Sarajevo – Mirujući saobraćaj, Fakultet za saobraćaj i komunikacije Sarajevo, 2005.

Šifra predmeta: 09-10-2TRTES020102	Naziv predmeta: ELEMENTI SIGURNOSTI CESTOVNIH VOZILA		
Ciklus: II	**Godina: I**	**Semestar: II**	**Broj ECTS kredita: 6**
Status: Izborni predmet		**Ukupan broj kontakt sati: 90** Predavanja 45 Vježbe 30 Seminar 15	
Učesnici u nastavi	**Nastavnici i saradnici izabrani na oblast kojoj predmet pripada/predmet**		
Preduslov za upis:	Ne		
Cilj (ciljevi) predmeta:	Sticanje znanja o osnovnim fizikalnim pojmovima o ponašanju vozila na kolovozu, konstrukciji, funkciji i zadacima klasičnih aktivnih i pasivnih elemenata sigurnosti cestovnih vozila kao i inteligentnih transportnih sistema ITS (*eng. Intelligent Transport Systems*) koji se ugrađuju u vozila, u cilju poboljšanja aktivne i pasivne sigurnosti vozila. Upoznavanje sa zakonskom regulativom koja se odnosi na ugradnju, održavanje i homologaciju ovih sistema i uređaja.Sticanje znanja o postupvima i metodama za određivanja brzine vozila.		
Tematske jedinice: *(po potrebi plan izvođenja po sedmicama se utvrđuje uvažavajući specifičnosti organizacionih jedinica)*	1. Uvod – osnove elemenata sigurnosti cestovnih vozila. Klasifikacija vozila. Elementi aktivne sigurnosti vozila 2. Fizikalni pojmovi o ponašanju vozila na kolovozu – dinamičke karakteristike(maksimalne vučne i kočione sile) 3. Fizikalni pojmovi o ponašanju vozila na kolovozu – uzdužna stabilnost vozila. Elementi kretanja i zaustavljanja vozila 4. Fizikalni pojmovi o ponašanju vozila na kolovozu-poprečna stabilnost vozila. Pneumatici i sigurnost kretanja 5. Osiguranje stabilnosti i upravljivosti vozila u procesu kočenja-Antiblokirajući kočioni sistem na vozilu 6. Sistem protiv proklizavanja pogonskih točkova (ASR). Elektronska kontrola stabilnosti vozila(ESP) 7. Sistemi za detekciju vozila, djelimičnu kontrolu vozila i podršku vozaču 8. Ergonomski parametri cestovnih vozila (konstrukcija radnog mjesta vozača, buka i vibracije) 9. Mjeritelji brzine vozila 10. Karoserija Crash test i sigurnost vozila 11. Sigurnosni pojasevi i nasloni za glavu i sigurnost 12. Zračni jastuci i sigurnost vozila 13. Autosjedalica i sigurnost cestovnih vozila 14. Elementi motornih vozila i procjena štete 15. Završna razmatranja-Ponavljanje i priprema za ispit		
Ishodi učenja:	Znanje: Poznavanje osnovnih elemenata aktivne i pasivne sigurnosti vozila i novih tehnologija i uređaja koji se ugrađuju na vozilu u cilju poboljšanja sigurnosti vozila. Poznavanje zakonske regulative(pravilnika, UNECE pravilnika, - EU Direktive,BAS I ISO standarda) koja se odnosi na ugradnju, održavanje i homologaciju ovih sistema i uređaja. Vještine: Sposobnost ocjene i provjere stanja aktivnih i pasivnih sistema i uređaja na vozilu. Sposobnost prepoznavanja osnovnih karakteristika naučnog istraživanja. Sposobnost prenošenja zaključaka i razloga koji su do njih doveli. Kompetencije: Kroz nastavni proces predavanja, vježbi i seminara		

	student će biti sposoban, na osnovu usvojenog znanja da kvalitetno vodi, nadzire i rješava probleme u stanicama za tehničke preglede vozila, da obavlja poslove vezane za homologaciju vozila, učestvuje u izradi pravilnika vezanih za sigurnost vozila i druge poslove vezane za sigurnost vozila.
Cilj održivog razvoja (SDG):	SDG3 – Zdravlje i blagostanje; SDG11 – Održivi gradovi i zajednice
Metode izvođenja nastave:	– Samostalno izlaganje – Diskusija – Analiza primjera iz prakse(zadaci,seminarski radovi)
Metode provjere znanja sa strukturom ocjene:	Ocjena kreativnosti na nastavi i vježbama uz izradu samostalnih radova, ocjena parcijalnog testa u toku nastave kao i ocjena završnog ispita. Kriterijum praćenja rada i ocjenjivanja studenta u toku nastave i to prema sljedećem načinu: – Domaća zadaća/seminarski rad/praktični rad/ 15 bodova (%), položeno ako se osvoji preko 55 %. – I Parcijalni ispit/test/provjera znanja/35 bodova (%), položen je ako se osvoji preko 55 %. – Završni ispit (II Parcijalni) 50 bodova (%), položeno ako se osvoji preko 55 %. – Završni ispit (Integralni) 85 bodova (%), položeno ako se osvoji preko 55 %. Ukupan broj bodova (%) koji student prema navedenom praćenju u toku nastave može ostvariti iznosi maksimalno 50 bodova (%), što sa Završnim (II parcijalnim) čini 100 bodova (%). Za studente koji nisu položili I Parcijalni ispit, Završni ispit (Integralni) se organizuje iz cjelokupnog pređenog gradiva u toku nastave i vježbi, i vrednuje se sa 85 bodova (%), što sa seminarskim radom/praktičnim radom čini 100 bodova (%). Konačan uspjeh studenta nakon svih predviđenih oblika provjere znanja, vrednuje se i ocjenjuje sistemom ocjenjivanja kako slijedi: a) 10 (A) - izuzetan uspjeh bez grešaka ili sa neznatnim greškama, nosi 95-100 bodova; b) 9 (B) - iznad prosjeka, sa ponekom greškom, nosi 85-94 bodova; c) 8 (C) - prosječan, sa primjetnim greškama, nosi 75-84 bodova; d) 7 (D) - općenito dobar, ali sa značajnijim nedostacima, nosi 65-74 bodova; e) 6 (E) - zadovoljava minimalne uslove, nosi 55-64 bodova; f) 5 (F, FX) - ne zadovoljava minimalne uslove, manje od 55 bodova. Ukupno vrednovanje svih obaveza studenta u toku semestra, odnosno ocjena na ispitu zasnovana je na ukupnom broju bodova (%) koje je student stekao ispunjavanjem predispitnih obaveza i polaganjem parcijalnog i završnog ispita, a prema kvalitetu stečenih znanja i vještina, i sadrži maksimalno 100 bodova, te se utvrđuje prema sljedećoj skali: Obaveze studenta Bodovi (%) Prisutnost na predavanjima i vježbama.....80 (%) Zadaća/Seminarski/Praksa/.....15 bodova (%) I Parcijalni ispit/Test/Provjera znanja/.....35 bodova (%) Završni ispit (II Parcijalni) .....50 bodova (%) Završni ispit (Integralni) .....85 bodova (%)
Literatura:	Obavezna: 1. Lindov, O.: Sigurnost u cestovnom saobraćaju, Univerzitetski udžbenik, Fakultet za saobraćaj i komunikacije, Sarajevo, 2008. 2. Lindov, O.: Transport i okoliš, Univerzitetski udžbenik, Fakultet za saobraćaj i komunikacije, Sarajevo, 2011.

	3. Lindov, O.: Ekspertize saobraćajnih nezgoda, Fakultet za saobraćaj i komunikacije, Sarajevo, 1998-2006, 4. Lindov, O.Dacić S.: Elementi sigurnosti cestovnih vozila, Skripta predavanja, Fakultet za saobraćaj i komunikacije, Sarajevo, 2012. 5. Lindov, O.Dacić S.: Elementi sigurnosti cestovnih vozila, Skripta vježbi i testova, Fakultet za saobraćaj i komunikacije, Sarajevo, 2012. Dopunska: 1. Dragač R.: Bezbednost drumskog saobraćaja – Knjiga III, Saobraćajni Fakultet, Beograd 1994.; 2. Čović M., Zečević D., Vještačenja u cestovnom prometu, Informator, Zagreb, 1987.; 3. Golubić J.: Osnove tehnike sigurnosti prometa, Fakultet prometnih znanosti, Zagreb, 1992.; 4. Rajamani,R.:Vehicle Dynamics and Control, University of Minnesota, USA, 2006.; 5. Kiencke, U.Nielsen L.: Automative Control Sistem, Universität Karlsruhe (TH) Department of Electrical Engineering, 2005.;

Šifra predmeta: **09-10-3TRTES020102**	**Naziv predmeta:** **ZAŠTITA U SAOBRAĆAJU I TRANSPORTU**		
Ciklus: II	**Godina: I**	**Semestar: II**	**Broj ECTS kredita: 6**
Status: Izborni predmet		**Ukupan broj sati: 90** Razraditi distribuciju sati po tipu: Predavanja: 30, Vježbe: 30, Seminar: 10, Terenski rad: 10, Laboratorijske vježbe: 5, Praksa: 5.	
Učesnici u nastavi	**Nastavnici i saradnici izabrani na oblast kojoj predmet pripada/predmet**		
Preduslov za upis:	NE		
Cilj (ciljevi) predmeta:	Sticanje edukacijskih oblika u realizaciji programa iz oblasti zaštite u saobraćaju i transportu, te praktičnim analizama, elaboratima, ekspertizama i preventivnim mjerama zaštite u cestovnom saobraćaju.		
Tematske jedinice: *(po potrebi plan izvođenja po sedmicama se utvrđuje uvažavajući specifičnosti organizacionih jedinica)*	1. Uvod – osnove zaštite saobraćaja i transporta 2. Strategija sigurnosti saobraćaja u Bosni i Hercegovini 3. Projekti EU i povećanje sigurnosti na cestama 4. Evidencija cesta, cestovnog pojasa, saobraćajne signalizacije i opreme na cestama (kategorizacija cesta, katastar cesta) 5. Ovlaštenja, obaveze i odgovornosti upravitelja cesta u vezi sa zaštitom cesta, obaveza ugovaranja održavanja i zaštite cesta 6. Zaštitni aspekt redovnog i vanrednog održavanja cesta 7. Upravljanje crnim tačkama 8. Zaštita cestovnog pojasa (regulisanje izgradnje i postavljanja objekata, autobuskih stajališta, benzinskih pumpi, priključaka, instalacija, reklamnih panoa i dr.) 9. Zaštita cesta od prekomjernog opterećenja i zaštita cesta od prekoračenja ukupne mase i osovinskog opterećenja 10. Upravljanje i zaštita u tunelima 11. Upravljanje i zaštita u blizini škole 12. Upravljanje i zaštita u zoni izvođenja radova 13. Upravljanje i zaštita na cestovno-željezničkim prelazima 14. Nadzor nad održavanjem cesta 15. Zaključna razmatranja		

Ishodi učenja:	Znanje: Teorijska i praktična znanja iz oblasti zaštite u saobraćaju i transportu. Osnovni propisi, pravila, metode i postupci u oblasti zaštite u saobraćaju i transportu. Vještine: Sposobnost primjene teorijskih i praktičnih znanja u oblasti zaštite u saobraćaju i transportu u funkciji izgradnje, održavanja i upravljanja efikasnog saobraćajnog sistema. Kompetencije: Sposobnosti samostalnog razumijevanja i korištenja propisa, korištenja stručne literature, korištenje softverskih alata, korištenje mjernih uređaja i opreme, primjene metoda i postupaka, mjerenja i istraživanja, izrada analiza, procjena rizika i praktičnih rješenja u okviru preventivnog djelovanja i zaštite u saobraćaju i transportu.
Cilj održivog razvoja (SDG):	"SDG3 – Zdravlje i blagostanje"; "SDG9 – Industrija, inovacije i infrstruktura"; "SDG11 – Održivi gradovi i zajednice";
Metode izvođenja nastave:	Usmeno iznošenje sa prezentacijom i prikazom različitih metoda, postupaka i procesa iz oblasti zaštite u saobraćaju i transportu uz korištenje video i audio zapisa, te samostalno izlaganje pojedinih konkretnih istraživanja i primjene metoda i postupaka iz oblasti zaštite u saobraćaju i transportu. Iniciranje rasprava i diskusija o problemima iz prakse, pojedinačnih zapažanja iz različitih okruženja, izrada samostalnih projekata i istraživanja iz oblasti zaštite u saobraćaju i transportu.
Metode provjere znanja sa strukturom ocjene:	Ocjena aktivnosti i kreativnosti na nastavi i vježbama uz izradu samostalnih radova, ocjena parcijalnog testa u toku nastave kao i ocjena završnog ispita. Kriterijum praćenja rada i ocjenjivanja studenta u toku nastave i to prema sljedećem načinu: – Seminarski rad (pismena i usmena provjera) 15 bodova (%), položeno ako se osvoji preko 50 %. – I Parcijalni ispit/test/provjera znanja/ (pismena provjera) 35 bodova (%), položen je ako se osvoji preko 50 %. – Završni ispit (II Parcijalni) (pismena provjera) 50 bodova (%), položeno ako se osvoji preko 50 %. – Završni ispit (Integralni) (pismena provjera) 85 bodova (%), položeno ako se osvoji preko 50 %. Ukupan broj bodova (%) koji student prema navedenom praćenju u toku nastave može ostvariti iznosi maksimalno 50 bodova (%), što sa Završnim (II parcijalnim) čini 100 bodova (%). Za studente koji nisu položili I Parcijalni ispit, Završni ispit (Integralni) se organizuje iz cjelokupnog pređenog gradiva u toku nastave i vježbi, i vrednuje se sa 85 bodova (%), što sa seminarskim radom/praktičnim radom čini 100 bodova (%). Studenti da bi položili ispit, trebaju položiti svaki od navedenih dijelova (svaki dio minimalno 50%) i to: seminarski rad, prvi parcijalni ispit (test) i završni ispit (drugi parcijalni ili integralni). Evaluacija seminarskog rada i prvog parcijalnog ispita (testa) se realizira u toku trajanja nastave. Studenti ponovci koji u prethodnoj akademskoj godini nisu položili ispit, a koji su ispunili određene obaveze i ostvarili određene bodove, iste mogu prenijeti u tekuću akademsku godinu. Studenti ponovci koji žele izvršiti prenos bodova, trebaju informisati predmetnog nastavnika na početku semestra, do kraja prve sedmice nastave. Prenos bodova se može izvršiti samo jednom. Konačan uspjeh studenta nakon svih predviđenih oblika provjere znanja, vrednuje se i ocjenjuje sistemom ocjenjivanja kako slijedi: a) 10 (A) - izuzetan uspjeh bez grešaka ili sa neznatnim greškama, nosi 95-100

	bodova; b) 9 (B) - iznad prosjeka, sa ponekom greškom, nosi 85-94 bodova; c) 8 (C) - prosječan, sa primjetnim greškama, nosi 75-84 bodova; d) 7 (D) - općenito dobar, ali sa značajnijim nedostacima, nosi 65-74 bodova; e) 6 (E) - zadovoljava minimalne uslove, nosi 55-64 bodova; f) 5 (F, FX) - ne zadovoljava minimalne uslove, manje od 55 bodova. Ukupno vrednovanje svih obaveza studenta u toku semestra, odnosno ocjena na ispitu zasnovana je na ukupnom broju bodova (%) koje je student stekao ispunjavanjem predispitnih obaveza i polaganjem parcijalnog i završnog ispita, a prema kvalitetu stečenih znanja i vještina, i sadrži maksimalno 100 bodova, te se utvrđuje prema sljedećoj skali: Obaveze studenta Bodovi (%) Prisutnost na predavanjima i vježbama.....0 bodova (Studenti su obavezni prisustvovati svim oblicima nastave minimalno 80%, a prisustvo na nastavi je uslov za ovjeru urednog pohađanja nastave. Ukoliko postoje opravdani razlozi, koji moraju biti pisano dokumentirani, studenti mogu izostati i do 30%, a odluku o pravdanju donosi predmetni nastavnik) Seminarski rad/.....15 bodova (%) I Parcijalni ispit/Test/Provjera znanja/.....35 bodova (%) Završni ispit (II Parcijalni) .....50 bodova (%) Završni ispit (Integralni) .....85 bodova (%)
Literatura:	Obavezna: 1. Lindov, O.: „Zaštita u saobraćaju i transportu“, skripta predavanja, Fakultet za saobraćaj Univerziteta u Sarajevu, 2017. 2. Lindov, O.: „Zaštita u saobraćaju i transportu“, skripta vježbi i testova Fakultet za saobraćaj Univerziteta u Sarajevu, 2017. 3. Lindov, O.: Sigurnost u cestovnom saobraćaju, Fakultet za saobraćaj i komunikacije, Sarajevo 2007. 4. Lindov, O., Priručnik za jačanje kapaciteta profesije bezbjednosti saobraćaja, Fakultet za saobraćaj i komunikacije Univeziteta u Sarajevu, Erasmus+ projekat Trafsaf, Sarajevo, 2020. 5. Perić. T., Ivaković Č,. Zaštita u prometnom procesu, Fakultet prometnih znanosti Zagreb, 1996.; 6. Rotim F.: Elementi sigurnosti cestovnog saobraćaja - Ekspertize saobraćajnih nezgoda, Zagreb, 1990. Dopunska: 1. Berislav Pavišić: Metodika istraživanja saobraćajnih delikata, Fakultet kriminalističkih znanosti, Zagreb, 1993. 2. Beširević, S.: Tehnologija željezničkog saobraćaja, Fakultet za saobraćaj i komunikacije, Sarajevo, 1998. 3. Direktiva 2008/96/EC Evropskog Parlamenta i Vijeća od 19. novembra 2008. godine o sigurnosti cestovne infrastrukture 4. ETSC RSA priručnik, Brisel 1997. Godine 5. Golubić., J, Osnove tehnike i sigurnosti prometa; Fakultet prometnih znanosti Zagreb, 1992.; 6. Kostić, S.: Tehnike sigurnosti i kontrole saobraćaja, FTN, Novi Sad, 2002. 7. Lindov, O.: Ekspertize saobraćajnih nezgoda, Fakultet za saobraćaj i komunikacije, Sarajevo, 1998-2006, 8. Regionalna strategija sigurnosti cestovnog saobraćaja (RRSS) za SEETO članice

<table>
<tr><td>Šifra predmeta:
09-10-4TRTES020102</td><td colspan="3">Naziv predmeta:
TEHNOLOŠKE ANALIZE CESTOVNOG TRANSPORTA</td></tr>
<tr><td>Ciklus: II</td><td>Godina: I</td><td>Semestar: II</td><td>Broj ECTS kredita: 6</td></tr>
<tr><td colspan="2">Status: Izborni predmet</td><td colspan="2">Ukupan broj sati: 150
Opciono razraditi distribuciju sati po tipu:
Predavanja 45
Vježbe 30
Laboratorijske vježbe 15
Seminar 30
Samostalni rad 30</td></tr>
<tr><td>Učesnici u nastavi</td><td colspan="3">Nastavnici i saradnici izabrani na oblast kojoj predmet pripada/predmet</td></tr>
<tr><td>Preduslov za upis:</td><td colspan="3">Ne</td></tr>
<tr><td>Cilj (ciljevi) predmeta:</td><td colspan="3">Sticanje edukacijskih oblika u realizaciji programa iz tehnoloških analiza cestovnog transporta. Sticanje znanja i vještina iz tehnoloških analiza cestovnog transporta.</td></tr>
<tr><td>Tematske jedinice:
(po potrebi plan izvođenja po sedmicama se utvrđuje uvažavajući specifičnosti organizacionih jedinica)</td><td colspan="3">
<table>
<tr><td>R.b.</td><td>Nastavne cjeline</td><td>Broj sati (P+V+L+S+Sr)</td></tr>
<tr><td>1.</td><td>Osnove analize tehnoloških procesa u prevozu putnika i roba</td><td>3+2+1+2+2</td></tr>
<tr><td>2.</td><td>Struktura tehnologije i organizacije cestovnog prevoza</td><td>(3+2+1+2+2)</td></tr>
<tr><td>3.</td><td>Obilježja prevoznih zahtjeva u cestovnom prevozu</td><td>2 x (3+2+1+2+2)</td></tr>
<tr><td>4.</td><td>Obilježja prevozne ponude u cestovnom prevozu putnika i roba</td><td>2 x (3+2+1+2+2)</td></tr>
<tr><td>5.</td><td>Osnove tehnoloških procesa u prevozu putnika i roba</td><td>2 x (3+2+1+2+2)</td></tr>
<tr><td>6.</td><td>Izmeritelji tehnoloških procesa u cestovnom prevozu</td><td>3 x (3+2+1+2+2)</td></tr>
<tr><td>7.</td><td>Analiza prevoznih procesa u cestovnom prevozu</td><td>2 x (3+2+1+2+2)</td></tr>
<tr><td>8.</td><td>Projektovanje i upravljanje procesima u cestovnom prevozu</td><td>(3+2+1+2+2)</td></tr>
<tr><td>9.</td><td>Nove tehnologije u analizi tehnoloških procesa u cestovnom prevozu</td><td>(3+2+1+2+2)</td></tr>
</table>
</td></tr>
<tr><td>Ishodi učenja:</td><td colspan="3">Studenti kroz nastavni proces predavanja, vježbi i praktičan rad trebaju steći odgovarajuća znanja vezano za analizu procesa u cestovnom transportu roba i putnika.
Izučavanje i praktična primjena, treba da osigura potreban nivo znanja studentima da mogu uspješno vršiti analizu tehnoloških procesa i pokazatelja poslovanja u transportu putnika i roba.</td></tr>
<tr><td>Cilj održivog razvoja (SDG):</td><td colspan="3">Cilj 4: Osigurati inkluzivno i kvalitetno obrazovanje, te promovirati mogućnosti cjeloživotnog učenja za sve ljude, svih životnih dobi
Cilj 9: Industrija, inovacije i infrastruktura
Cilj 11: Održivi gradovi i zajednice
Cilj 12: Održiva potrošnja i proizvodnja
Cilj 13: Klimatska akcija</td></tr>
<tr><td>Metode izvođenja nastave:</td><td colspan="3">Sticanje znanja i vještina iz tehnoloških analiza cestovnog transporta.</td></tr>
<tr><td>Metode provjere znanja sa strukturom ocjene:</td><td colspan="3">Praćenje rada studenta se vrši dodjeljivanjem bodova za svaki oblik aktivnosti i provjere znanja u toku semestra, kao i na završnom ispitu</td></tr>
</table>

	nakon završetka semestra prema sljedećim elementima praćenja: – Domaća zadaća/seminarski rad/praktični rad/ 15 bodova (%), vrednuje se ako je položeno preko 50 % – I Parcijalni ispit/I test/I provjera znanja/35 bodova (%), vrednuje se ako je položeno preko 50 % – Završni ispit (II Parcijalni) 50 bodova (%), vrednuje se ako je položeno preko 50%. – Završni ispit (Integralni) 85 bodova (%), vrednuje se ako je položeno preko 50%. Ukupan broj bodova (%) koji student prema navedenom praćenju u toku nastave može ostvariti iznosi maksimalno 50 bodova (%), što sa Završnim (II parcijalnim) čini 100 bodova (%). Za studente koji nisu položili I Parcijalni ispit, Završni ispit (Integralni) se organizuje iz cjelokupnog pređenog gradiva u toku nastave i vježbi vrednuje se sa 85 bodova (%), što sa seminarskim radom/praktičnim radom čini 100 bodova (%). Konačan uspjeh studenata nakon svih predviđenih oblika provjere znanja, vrednuje se i ocjenjuje sistemom ocjenjivanja kako slijedi: a) 10 (A) - izuzetan uspjeh bez grešaka ili sa neznatnim greškama, nosi 95-100 bodova; b) 9 (B) - iznad prosjeka, sa ponekom greškom, nosi 85-94.99 boda; c) 8 (C) - prosječan, sa primjetnim greškama, nosi 75-84,99 boda; d) 7 (D) - općenito dobar, ali sa značajnim nedostacima, nosi 65-74,99 boda; e) 6 (E) - zadovoljava minimalne uslove, nosi 55-64,99 boda; f) 5 (F, FX) - ne zadovoljava minimalne uslove, manje od 55 bodova.
Literatura:	Obavezna: 1. Topenčarević, Lj.: Organizacija i tehnologija drumskog transporta, Građevinska knjiga, Beograd, 1987.g. 2. Županović, I.: Tehnologija cestovnog prijevoza, Fakultet prometnih znanosti, Zagreb, 2002.g. Dopunska: 1. Mehanović, M., 2017. „Planiranje u saobraćaju, prevozu i komunikacijama “. Fakultet za saobraćaj i komunikacije u Sarajevu, Sarajevo. 2. Mehanović, M., 2011. „Planiranje ponude usluga u gradskom prometu putnika“. Fakultet za saobraćaj i komunikacije u Sarajevu, Sarajevo. 3. Mehanović, M.: “Zadaci i primjeri iz teorije i prakse u javnom gradskom prevozu putnika”, Fakultet za saobraćaj i komunikacije, Sarajevo, 2005. 4. Oblak, H. i Mulej, M.: Organiziranje poslovanja prometnih podjetij, Univerza v Mariboru, Maribor, 1998.g. 5. Uzelac, J.: Kibernetizacija poslovanja, Ekonomski fakultet Rijeka, 1994.g. 6. Zelenika, R.; Jakomin, L.: Suvremeni transportni sistemi, Ekonomski fakultet sveučilišta u Rijeci, Rijeka, 1995.g.

Šifra predmeta: **09-10-5TRTES020102**	**Naziv predmeta:** **OPTIMIZACIJA I UPRAVLJANJE VOZNIM PARKOVIMA**		
Ciklus: II	**Godina: I**	**Semestar: II**	**Broj ECTS kredita: 6**
Status: Izborni predmet		**Ukupan broj sati: 90** Razraditi distribuciju sati po tipu:	

	Predavanja: 30, Vježbe: 20, Seminar: 10, Laboratorijske vježbe: 10, Praksa: 10, Terenski rad: 10.
Učesnici u nastavi	**Nastavnici i saradnici izabrani na oblast kojoj predmet pripada/predmet**
Preduslov za upis:	NE
Cilj (ciljevi) predmeta:	Sticanje edukacijskih oblika neophodnih za saobraćajno-ekonomsko vrednovanje iz domena optimizacije, eksploatacije i upravljanja voznim parkom. Također, upoznavanje i sticanje neophodnih znanja, za optimizaciju, eksploataciju i upravljanje voznim parkom u unutrašnjem i međunarodnom cestovnom transportu putnika i tereta. Navedeno se zasniva na stručnim, praktičnim i realnim tržišnim principima. Rad sa softverima namijenjenim upravljanu voznim parkovima.
Tematske jedinice: *(po potrebi plan izvođenja po sedmicama se utvrđuje uvažavajući specifičnosti organizacionih jedinica)*	1. Uvod – osnove optimizacije i upravljanja voznim parkovima. 2. Jedinstveni europski transportni prostor. 3. Pojam i značenje optimizacije voznog parka. 4. Pojam i značenje eksploatacije voznog parka. 5. Regulacija transportnih usluga u unutrašnjem i međunarodnom transportu. 6. Karakteristike i podjela voznog parka. 7. Izbor, modeli finansiranja nabavke i otpisa vozila. 8. Modeli organizacije i upravljanja voznim parkom. 9. Transportni procesi i elementi rada voznog parka. 10. Analiza transportnih troškova. 11. Mjerenje učinka rada voznog parka i osoblja. 12. Primjena softvera za izbor transportnog puta i formiranje cijene transporta. 13. Stručno usavršavanje zaposlenika u transportnom preduzeću. 14. Fleet Menagement – novi trend upravljanja voznim parkom. 15. Zaključna razmatranja o optimizaciji i upravljanju voznim parkovima.
Ishodi učenja:	Znanje: Teorijska odgovarajuća znanja i iskustva za praktičnu primjenu u oblasti domena optimizacije, eksploatacije i upravljanja voznim parkovima. Kroz materiju predmeta, studenti će biti osposobljen: za provođenje multi kriterijske analize za izbor optimalnog modela upravljanja i eksploatacije voznog parka; da planira troškove transporta i rada voznog parka i osoblja; da planira upravljanje voznim parkom u unutrašnjem i međunarodnom transportu; da planira investiciona ulaganja. Vještine: Sposobnost primjene teorijskih i praktičnih znanja neophodnih za adekvatnu analizu, eksploataciju, optimizaciju i upravljanje voznim parkom. Kompetencije: Sposobnosti samostalnog razumijevanja i korištenja propisa, korištenja stručne literature, primjene metoda i postupaka, mjerenja i istraživanja, izrada analiza, procjena i praktičnih rješenja, preventivnog djelovanja, te postupaka neophodnih za adekvatnu analizu, optimizaciju i upravljanje voznim parkom.
Cilj održivog razvoja (SDG):	COR4 – Kvalitetno obrazovanje - Osigurati uključivo i kvalitetno obrazovanje, te promovirati mogućnosti cjeloživotnog učenja svih ljudi, svih životnih dobi COR5-Rodna ravnopravnost - Postići rodnu ravnopravnost i osnažiti sve žene i djevojčice. COR8-Dostojanstven rad i ekonomski rast - Promovirati uključiv i održiv ekonomski rast, zaposlenost i dostojanstven rad za sve. COR9- Industrija, Inovacije i Infrastruktura -Izgraditi izdržljivu infrastrukturu, promovirati uključivu i održivu industrijalizaciju i poticati inovativnost. COR11 – Održivi gradovi i lokalne zajednice - Učiniti gradove i naselja uključivim, sigurnim, prilagodljivim i održivim.

<table>
<tr><td></td><td>COR12-Održiva potrošnja i proizvodnja - Osigurati održive oblike potrošnje i proizvodnje.
COR13-Zaštita klime - Poduzeti hitne akcije u borbi protiv klimatskih promjena i njihovih posljedica
COR17- Partnerstvom do ciljeva- Uvrstiti globalno partnerstvo za održivi razvoj</td></tr>
<tr><td>Metode izvođenja nastave:</td><td>Usmeno iznošenje sa prezentacijom i prikazom različitih analiza, studija, modela i metoda u oblasti optimizacije i upravljanje voznim parkom uz korištenje video i audio zapisa, softvera, mjerne opreme, te samostalno izlaganje pojedinih konkretnih istraživanja. Iniciranje rasprava i diskusija o problemima iz prakse, pojedinačnih zapažanja iz različitih okruženja, izrada samostalnih analiza, istraživanja, mjerenja i modeliranja u oblasti optimizacije i upravljanje voznim parkom.</td></tr>
<tr><td>Metode provjere znanja sa strukturom ocjene:</td><td>Ocjena kreativnosti na nastavi i vježbama uz izradu samostalnih radova, ocjena parcijalnog testa u toku nastave kao i ocjena završnog ispita. Kriterijum praćenja rada i ocjenjivanja studenta u toku nastave i to prema sljedećem načinu:
– Seminar 15 bodova (%), položeno ako se osvoji preko 50 %.
– I Parcijalni ispit/test/provjera znanja/35 bodova (%), položen je ako se osvoji preko 50 %.
– Završni ispit (II Parcijalni) 50 bodova (%), položeno ako se osvoji preko 50 %.
– Završni ispit (Integralni) 85 bodova (%), položeno ako se osvoji preko 50 %.
Ukupan broj bodova (%) koji student prema navedenom praćenju u toku nastave može ostvariti iznosi maksimalno 50 bodova (%), što sa Završnim (II parcijalnim) čini 100 bodova (%). Za studente koji nisu položili I Parcijalni ispit, Završni ispit (Integralni) se organizuje iz cjelokupnog pređenog gradiva u toku nastave i vježbi, i vrednuje se sa 85 bodova (%), što sa seminarskim radom/praktičnim radom čini 100 bodova (%). Konačan uspjeh studenta nakon svih predviđenih oblika provjere znanja, vrednuje se i ocjenjuje sistemom ocjenjivanja kako slijedi: a) 10 (A) - izuzetan uspjeh bez grešaka ili sa neznatnim greškama, nosi 95-100 bodova; b) 9 (B) - iznad prosjeka, sa ponekom greškom, nosi 85-94 bodova; c) 8 (C) - prosječan, sa primjetnim greškama, nosi 75-84 bodova; d) 7 (D) - općenito dobar, ali sa značajnijim nedostacima, nosi 65-74 bodova; e) 6 (E) - zadovoljava minimalne uslove, nosi 55-64 bodova; f) 5 (F, FX) - ne zadovoljava minimalne uslove, manje od 55 bodova.
Ukupno vrednovanje svih obaveza studenta u toku semestra, odnosno ocjena na ispitu zasnovana je na ukupnom broju bodova (%) koje je student stekao ispunjavanjem predispitnih obaveza i polaganjem parcijalnog i završnog ispita, a prema kvalitetu stečenih znanja i vještina, i sadrži maksimalno 100 bodova, te se utvrđuje prema sljedećoj skali:
<table>
<tr><td>Obaveze studenta</td><td>Bodovi (%)</td></tr>
<tr><td>Prisutnost na predavanjima i vježbama. (obavezno je prisustvu svim oblicima nastave min. 80 % i ovo je uslov za ovjeru/potpis urednog pohađanja)</td><td>0 bodova</td></tr>
<tr><td>Seminar</td><td>15 bodova (%)</td></tr>
<tr><td>I Parcijalni ispit/Test/Provjera znanja/</td><td>35 bodova (%)</td></tr>
<tr><td>Završni ispit (II Parcijalni)</td><td>50 bodova (%)</td></tr>
<tr><td>Završni ispit (Integralni)</td><td>85 bodova (%)</td></tr>
</table></td></tr>
<tr><td>Literatura:</td><td>Obavezna
1. Kiso A. Fahrudin, Eksploatacioni troškovi u cestovnom saobraćaju (skripta), Sarajevo, 1994.</td></tr>
</table>

	2. Lindov O., Džaferović S., Tehnologija cestovnog transporta (skripta predavanja), Fakultet za saobraćaj i komunikacije Sarajevo, 2013. 3. Topenčarević, Lj., Organizacija i tehnologija cestovnog transporta, IRO "Građevinska knjiga", Beograd, 1987. 4. Vešović, V., Bojanić, N., Organizacija saobraćajnih preduzeća, Beograd, 2002. 5. Zelenika, R., Prometni sustavi, Ekonomski fakultet u Rijeci, 2001. 6. Županović, I., Ribarić, B., Organizacija i praćenje učinka cestovnih prijevoznih sredstava, Fakultet prometnih znanosti Zagreb, 1983. 7. Županović, I., Tehnologija cestovnog prijevoza, Fakultet prometnih znanosti Zagreb, 1994. 8. Lindov O., Džaferović S., Tehnologija cestovnog transporta (skripta zadataka, testovi za polaganje), Fakultet za saobraćaj i komunikacije Sarajevo, 2013. Dopunska: 1. Grbo, A., Komercijalna podjela GPS uređaja, časopis "Zaštita", broj 4, juli/avgust 2006. 2. Lindov, O., Tehnologija drumskog transporta (skripta zadataka), Fakultet za saobraćaj i komunikacije Sarajevo, 2007. 3. NEA Cost (Računanje troškova u Cestovnom transportu), FSK, 2000.

Šifra predmeta: **09-10-6TRTES020102**	**Naziv predmeta:** **STANDARDIZACIJA U CESTOVNOM SAOBRAĆAJU**		
Ciklus: II	**Godina: I**	**Semestar: II**	**Broj ECTS kredita: 6**
Status: Izborni predmet		**Ukupan broj sati: 45 + 45** Razraditi distribuciju sati po tipu: 3 P + 2 V + 1 L/PR Predavanja, Vježbe, Seminar, Laboratorijske vježbe, Praksa…	
Učesnici u nastavi	**Nastavnici i saradnici izabrani na oblast kojoj predmet pripada/predmet**		
Preduslov za upis:	Obavezno je prisustvo i aktivnost na predavanjima i vježbama, te izrada projektnog zadatka.		
Cilj (ciljevi) predmeta:	Upoznavanje studenata sa općim pojmovima o standardima i standardizaciji, usvojenim definicijama, vrstama i tipičnoj strukturi standarda, te rastućem značaju upotrebe standarda u svim područjima ljudskog djelovanja, sa posebnim osvrtom na željeznički saobraćaj.		
Tematske jedinice: *(po potrebi plan izvođenja po sedmicama se utvrđuje uvažavajući specifičnosti organizacionih jedinica)*	1. Osnove savremene standardizacije. Nivoi standardizacije. Međunarodne, evropske i nacionalne organizacije za standardizaciju 2. Nacionalni BAS standardi. Označavanje i datiranje BAS standarda.Metode preuzimanja međunarodnih i evropskih standarda; 3. Pregled BAS tehničkih komiteta. Korespodentni međunarodni i evropski tehnički komiteti. 4. ICS klasifikacija. Područja, grupe i podgrupe. Područja, grupe i podgrupe koje se odnose na željeznički saobraćaj 5. Područja rada BAS tehničkih komiteta koji se odnose na željeznički saobraćaj i korespodentni međunarodni/evropski TC 6. Osnovna podjela standarda sa primjerima generičkih i specifičnih standarda iz područja željezničkog saobraćaja. 7. Sistematizacija BAS standarda iz područja željezničkog saobraćaja 8. Primjeri standarda iz područja 45. ICS klasifikacije, grupa 45.020 - inžinjerstvo šinskog saobraćaja općenito, 45.040 – materijali i komponente za inžinjerstvo šinskog saobraćaja. Analiza područja primjene i strukture standarda. 9. Primjeri standarda iz grupa 45.060 ICS klasifikacije – šinska vozila,		

	uključujući materijale, komponente, električnu i elektronsku opremu za šinska vozila. Analiza područja primjene i strukture standarda. 10. Primjeri standarda iz grupe 45. 080 ICS klasifikacije - šine i komponente pruga. Analiza područja primjene i strukture standarda. 11. Primjeri standarda iz područja 45.120 ICS klasifikacije - oprema za gradnju i održavanje željeznica. Analiza područja primjene i strukture standarda. 12. Primjeri standarda iz područja ostalih područja ICS klasifikacije koja se odnose na željeznički saobraćaj. Analiza područja primjene i strukture standarda. 13. Direktive novog pristupa. Osnovni principi i ciljevi. 14. Harmonizirani evropski standardi iz područja željezničkog saobraćaja Primjeri harmoniziranih standarda koji se odnose na pojedine komponente željezničkih vozila. Analiza područja primjene i strukture standarda
Ishodi učenja:	Znanje: Predmet omogućava upoznavanje studenata sa generičkim standardima i specifičnim standardima iz područja željezničkog saobraćaja na svim nivoima, kategorisanim prema ICS klasifikaciji i područjima rada nacionalnih i korespodentnih međunarodnih i evropskih TC. Kroz nastavni proces predavanja, vježbi i izrade seminarskog rada student će biti sposoban, na osnovu usvojenog znanja da pravilno pristupi izboru standarda za određene uslove eksploatacije. Vještine:- koristi tehničku literaturu, priručnike i tabele iz ove oblasti. - Prati i usvaja znanja iz stručnih predmeta koji se odnose na standarde vezane za sigurnost šinskog saobraćaja Kompetencije:- ovladavanjem znanja o osnovnim principima primjene standarda vezanih za funkcionalnost sistema u kom učestvuju šinska vozila, a student stiče kompentecije vezane za postupke tehničkog održavanja, certificiranja i homologacije vozila
Cilj održivog razvoja (SDG):	– Cilj 9: Industrija, inovacije i infrastruktura – Cilj 11: Održivi gradovi i zajednice – Cilj 12: Odgovorna potrošnja i proizvodnja – Cilj 13: Klimatske akcije – Cilj 17: Partnerstvo za ciljeve – Cilj 8: Dostojanstven rad i ekonomski rast – Cilj 16: Mir, pravda i jake institucije
Metode izvođenja nastave:	1. Predavanja i diskusije: Klasična metoda u kojoj se prenosi teorijsko znanje studentima. 2. Multimedijalna sredstva: Korištenje video materijala, prezentacija, simulacija i interaktivnih alata za bolje razumjevanje gradiva. 3. Radionice i vježbe: Aktivno učenje kroz praktične primjere, rad na problemima, primjena teorije na stvarnim situacijama. 4. Projekti i istraživanja: Rad na projektima vezanim za željeznička vozila, npr dizajniranje sigurnosnih sistema. 5. Terenske posjete: Posjete servisima, radionama, laboratorijama za cerificiranje, radionama za homologaciju, saobraćajnim policijama. 6. Online: Korištenje online platformi, alata, resursa za učenje sa što više razmjena informacija. 7. Studije slučaja: Analiza stvarnih situacija ili problema u vezi sa šinskim vozilima.
Metode provjere znanja sa strukturom ocjene:	Kriterij vrednovanja rada i ocjenjivanja studenta u toku nastave, vrši se na sljedeći način: Prisustvo nastavi i vježbama od 0 – 10 bodova (%); Domaća zadaća/seminarski rad/praktični rad/ od 0 do 10 bodova (%);

	I parcijalni ispit/I test/ I provjera znanja/ od 0 do 15 bodova (%); II parcijalni ispit/II test/ II provjera znanja / od 0 do 20 bodova (%). Ukupan broj bodova (%) koji studenta prema navedenom praćenju u toku nastave može ostvariti iznosi maksimalno 55 bodova (%). Završni ispit iznosi najviše 45 bodova odnosno 45 (%). Završni ispit se organizuje iz cjelokupnog pređenog gradiva u toku nastave.
Literatura:	Obavezna: 1. Behmen, A.: Salihović, S.:"Materijali i robe u transportu-knjiga I – klasifikacija, standardizacija, identifikacija", Fakultet za saobraćaj i komunikacije Sarajevo i DES Sarajevo, 2007. 2. Behmen, A.: Salihović, S.:"Materijali i robe u transportu-knjiga II – kvalitet: osnove, principi, kontrola", Fakultet za saobraćaj i komunikacije Sarajevo i DES Sarajevo, 2008. 3. Jagodić Z.: Roba u prometu, Institut za privredni inženjering Zenica, Zenica 2024. 4. Međunarodni/evropski/nacionalni standardi Dopunska: 1. F. Klisura: Standardizacija u cestovnom sobraćaju, predavanja, Fakultet za saobraćaj i komunikacije, Sarajevo, 2023 i 2024. 2. F. Klisura: Standardizacija u cestovnom saobraćaju, vježbe zadaci, Fakultet za saobraćaj i komunikacije, Sarajevo, 2023 i 2024.

Šifra predmeta: **09-10-7TRTES020102**	**Naziv predmeta:** **PRIMJENA GIS-A U SAOBRAĆAJNOM INŽENJERSTVU**		
Ciklus: II	**Godina: I**	**Semestar: I**	**Broj ECTS kredita: 6**
Status: Izborni predmet		**Ukupan broj sati: 90** Predavanja: 45 Vježbe: 30 Seminari i projektni zadaci: 15	
Učesnici u nastavi	**Nastavnici i saradnici izabrani na oblast kojoj predmet pripada/predmet**		
Preduslov za upis:	NE		
Cilj (ciljevi) predmeta:	Upoznavanje studenata sa osnovnim konceptima GIS sistema, načinom rada ovih sistema, planiranjem, implementacijom i mogućim primjenama.		
Tematske jedinice: *(po potrebi plan izvođenja po sedmicama se utvrđuje uvažavajući specifičnosti organizacionih jedinica)*	1. Pojam geoinformacijskih sistema (GIS) 2. Komponente GIS-a 3. Proces prikupljanja i manipulacije GIS podacima 4. Struktura i modeli prostornih podataka 5. Upravljanje bazom podataka 6. Koordinatni sistemi, projekcije, georeferenciranje 7. Baze geografskih podataka 8. Standardizacija u GIS-u 9. Izlazni podaci i kartografija 10. Tehnike grafičkog prikaza 11. Principi slojevitog prikaza prostornih podataka 12. Oblasti primjene i osnovne GIS funkcije 13. Web i mobilni GIS 14. Primjena GIS-a u planiranju telekomunikacijske infrastrukture 15. Primjena GIS-a u planiranju saobraćajne infrastrukture		
Ishodi učenja:	Znanje: Studenti će biti upoznati sa osnovnim konceptima razvoja i standardizacijom u oblasti GIS-a, principima web i mobilnih GIS		

	sistema kao i konkretnoj primjeni sa posebnim fokusom na oblast saobraćaja i komunikacija. Studenti će se upoznati sa procesom razvoja GIS sistema, od trenutka javljanja ideje i potrebe za GIS-om, prikupljanja podataka i formiranja GIS baze podataka, georeferenciranja, grafičkog prikaza i korištenja GIS sistema. Vještine: Studenti će savladati određene softverske alate potrebne za projektovanje i razvoj GIS sistema. Kompetencije: Nakon položenog ispita student će biti u mogućnosti planirati, projektovati i razvijati GIS sisteme i izvršiti odabir odgovarajućih tehnologija za razvoj specifičnih rješenja.
Cilj održivog razvoja (SDG):	SDG9 – Industrija, inovacije i infrastruktura SDG11 – Održivi gradovi i zajednice
Metode izvođenja nastave:	Nastava se realizira kroz izvođenje predavanja, vježbi i praktičnog dijela nastave koji uključuje laboratorijske vježbe. Predavanja se realizuju kroz usmeno izlaganje sa prezentacijom i prikazom primjera iz prakse. Vježbe i laboratorijske vježbe održavaju se uz upotrebu softverskih alata za rješavanje konkretnih problemskih i praktičnih zadataka. Studenti će biti obavezni izraditi i prezentirati seminarske radove i/ili projektne zadatake. U toku nastave se koriste različite metode koje uključuju: usmeno izlaganje, razgovori diskusije, demonstracije, individualni i grupni rad, itd.
Metode provjere znanja sa strukturom ocjene:	Ukupan broj bodova koji student može ostvariti u toku nastave je 50 i na završnom ispitu 50. Bodovi u toku nastave su raspoređeni na zadaće i aktivnost i/ili seminar i/ili projektni zadatak i na parcijalni ispit. Završni/popravni ispit uključuje gradivo koje student nije položio na parcijalnom ispitu što znači da obuhvata drugi dio gradiva koji se vrednuje sa 50 bodova za studente koji su položili parcijalni ispit. Studenti koji nisu položili gradivo sa parcijalnog ispita polažu gradivo sa parcijalnog i završnog ispita. Završni / popravni ispit se organizuje kao pismeni i/ili usmeni ispit uz polaganje praktičnog dijela. Ukupno vrednovanje svih obaveza studenta u toku semestra, odnosno ocjena na ispitu, zasnovana je na ukupnom broju bodova koje je student stekao ispunjavanjem predispitnih obaveza, polaganjem parcijalnog i završnog ispita. Prema kvalitetu stečenih znanja i vještina student može osvojiti maksimalno 100 bodova, a prema sljedećoj skali: Struktura bodovanja Bodovi (%) Seminar / Aktivnost na nastavi / Projektni zadatak:..... 20 bodova (%) I test / I provjera znanja (I parcijalni ispit):..... 30 bodova (%) Završni ili popravni ispit (II parcijalni ispit):..... 50 bodova (%) Potreban uslov za polaganje ispita je 55 bodova u sumi uz ostvarenih najmanje 55% bodova na provjerama znanja (parcijalni ispit i završni/popravni ispit). Konačan uspjeh studenta, nakon svih predviđenih oblika provjere znanja, vrednuje se i ocjenjuje sistemom kako slijedi: a) 10 - izuzetan uspjeh bez grešaka ili sa neznatnim greškama (95-100 bodova); b) 9 - iznad prosjeka, sa ponekom greškom (85-94 bodova); c) 8 - prosječan, sa primjetnim greškama (75-84 bodova); d) 7 - općenito dobar, ali sa značajnijim nedostacima (65-74 bodova); e) 6 - zadovoljava minimalne uslove (55-64 bodova); f) 5 - ne zadovoljava minimalne uslove (manje od 55 bodova).
Literatura:	Obavezna: 1. Nastavni materijal dostupan na Intranet portalu Fakulteta za saobraćaj i komunikacije. Dopunska:

	1. Kang Tsung Chang, „*Introduction to Geographic Information Systems*“, McGraw-Hill Education, 2019. 2. Paul Bolstad, „*GIS Fundamentals A First Text on Geographic Information Systems*,“ Eider Press, 2016. 3. Ian Heywood, Sarah Cornelius, „*An introduction to geographical information systems*“, Pearson Education Limited, 2006. 4. Kurt Menke, Richard Smith Jr., Luigi Pirelli, John Van Hoesen, „*Mastering QGIS*“,“ Packt Publishing Ltd., 2016. 5. Gábor Farkas, „Practical GIS,“ Packt Publishing Ltd., 2017. 6. Anita Graser, „*Learning QGIS*,“ Packt Publishing Ltd., 2016. 7. Ralph M. Stair, George W. Reynolds, „*Fundamentals of Information Systems*,“ Cengage Learning, 2016. 8. Alan Dennis, Barbara Haley Wixom, Roberta M. Roth, „*Systems analysis and design*,“ Wiley, 2015. 9. Patricia Wallace, „*Introduction to Information Systems*,“ Pearson Education, 2015. 10. Arthur M. Langer, „*Analysis and Design of Information Systems, Springer-Verlag*,“ 2008. 11. John Wang, „*Innovations in Supply Chain Management for Information Systems*,“ Business Science Reference, 2010. 12. Christos Kalloniatis: “*Modern Information Systems*,“ InTech Croatia, 2012.

Šifra predmeta: **09-10-8TRTES020102**	**Naziv predmeta:** **ELEKTRIČNA I AUTONOMNA CESTOVNA VOZILA**		
Ciklus: II	**Godina: I**	**Semestar: II**	**Broj ECTS kredita: 6**
Status: Izborni predmet		**Ukupan broj kontakt sati: 90** Predavanja: 30 Vježbe: 30 Seminar: 10 Terenski rad: 10 Laboratorijske vježbe: 5 Praksa: 5	
Učesnici u nastavi	**Nastavnici i saradnici izabrani na oblast kojoj predmet pripada/predmet**		
Preduslov za upis:	Ne		
Cilj (ciljevi) predmeta:	Sticanje znanja o osnovama koncepta električnih i autonomnih cestovnih vozila, osnovnim elementima sistema sigurnosti, pripadajućoj adaptivnoj infrastrukturi, te procesima upravljanja i funkcionisanja.		
Tematske jedinice: *(po potrebi plan izvođenja po sedmicama se utvrđuje uvažavajući specifičnosti organizacionih jedinica)*	1. Osnove koncepta električnih cestovnih vozila 2. Osnovni sistemi i elementi električnih cestovnih vozila 3. Sigurnosni standardi i zahtjevi za električna cestovna vozila i infrastrukturu 4. Elementi sistema sigurnosti električnih cestovnih vozila i infrastrukture 5. Električna cestovna vozila i koncept održive urbane mobilnosti 6. EU planovi elektromobilnosti u cestovnom saobraćaju 7. Osnove koncepta autonomnih cestovnih vozila 8. Osnovni sistemi i elementi autonomnih cestovnih vozila 9. Sigurnosni standardi i zahtjevi za autonomna cestovna vozila i adaptivnu infrastrukturu 10. Elementi sistema sigurnosti autonomnih cestovnih vozila i adaptivne infrastrukture		

	11. Pametni gradovi i održiva urbana mobilnost 12. EU planovi autonomne mobilnosti u cestovnom saobraćaju 13. IoT rješenja i autonomna vozila 14. Računarske mreže i protokoli u autonomnim cestovnim vozilima 15. Vještačka inteligencija i autonomna cestovna vozila
Ishodi učenja:	Znanje: Sticanje temeljnih znanja o osnovama električnih i autonomnih cestovnih vozila, osnovnim standardima i propisima, osnovnim sistemima, elementima sigurnosti saobraćaja, eksploataciji i upravljanju. Vještine: Sposobnosti samostalnog razumijevanja i prepoznavanja problema u procesima funkcionisanja sistema električnih i autonomnih cestovnih vozila i adaptivne infrastrukture. Kompetencije: Primjena teorijskih i praktičnih znanja u funkciji unaprijeđenja sistema sigurnosti koncepta električnih i autonomnih cestovnih vozila i adaptivne infrastrukture.
Cilj održivog razvoja (SDG):	SDG3 – Zdravlje i blagostanje; SDG11 – Održivi gradovi i zajednice
Metode izvođenja nastave:	Predavanja popraćena multimedijalnim prezentacijama. Rješavanje praktičnih problema i konkretnih projektnih zadataka.
Metode provjere znanja sa strukturom ocjene:	Ocjena kreativnosti na nastavi i vježbama uz izradu samostalnih radova, ocjena parcijalnog testa u toku nastave kao i ocjena završnog ispita. Kriterijum praćenja rada i ocjenjivanja studenta u toku nastave i to prema sljedećem načinu: – Seminar/Terenski rad/Lab. vjezbe/Praksa/ 15 bodova (%), položeno ako se osvoji preko 50 %. – I Parcijalni ispit/test/provjera znanja/35 bodova (%), položen je ako se osvoji preko 50 %. – Završni ispit (II Parcijalni) 50 bodova (%), položeno ako se osvoji preko 50 %. – Završni ispit (Integralni) 85 bodova (%), položeno ako se osvoji preko 50 %. Ukupan broj bodova (%) koji student prema navedenom praćenju u toku nastave može ostvariti iznosi maksimalno 50 bodova (%), što sa Završnim (II parcijalnim) čini 100 bodova (%). Za studente koji nisu položili I Parcijalni ispit, Završni ispit (Integralni) se organizuje iz cjelokupnog pređenog gradiva u toku nastave i vježbi, i vrednuje se sa 85 bodova (%), što sa seminarskim radom/praktičnim radom čini 100 bodova (%). Konačan uspjeh studenta nakon svih predviđenih oblika provjere znanja, vrednuje se i ocjenjuje sistemom ocjenjivanja kako slijedi: a) 10 (A) - izuzetan uspjeh bez grešaka ili sa neznatnim greškama, nosi 95-100 bodova; b) 9 (B) - iznad prosjeka, sa ponekom greškom, nosi 85-94 bodova; c) 8 (C) - prosječan, sa primjetnim greškama, nosi 75-84 bodova; d) 7 (D) - općenito dobar, ali sa značajnijim nedostacima, nosi 65-74 bodova; e) 6 (E) - zadovoljava minimalne uslove, nosi 55-64 bodova; f) 5 (F, FX) - ne zadovoljava minimalne uslove, manje od 55 bodova. Ukupno vrednovanje svih obaveza studenta u toku semestra, odnosno ocjena na ispitu zasnovana je na ukupnom broju bodova (%) koje je student stekao ispunjavanjem predispitnih obaveza i polaganjem parcijalnog i završnog ispita, a prema kvalitetu stečenih znanja i vještina, i sadrži maksimalno 100 bodova, te se utvrđuje prema sljedećoj skali: Obaveze studenta Bodovi (%) Prisutnost na predavanjima i vježbama.....80 (%) Seminar/Terenski rad/Lab.vjezbe/Praksa /.....15 bodova (%)

	I Parcijalni ispit/Test/Provjera znanja/.....35 bodova (%) Završni ispit (II Parcijalni) .....50 bodova (%) Završni ispit (Integralni) .....85 bodova (%)
Literatura:	Obavezna: 1. B. Schoettl, et all, A survey of public opinion about autonomous and self-driving vehicles in the US, the UK, and Australia. 2014. 2. D. Howard, D. Dai, Public perceptions of self-driving cars: The case of Berkeley, California. In: Transportation Research Board 93rd Annual Meeting. 2014. 3. Di Natale, et all, Understanding and Using the Controller Area Network Communication Protocol – Theory and Practice Springer New York, 2014. 4. Electric Car - history and components, M. Stojkov, D. Gašparović, D. Pelin, H. Glavaš, K. Hornung, N. Mikulandra, 12th Natural Gas, Heat and Water Conference, 5th International Natural Gas, Heat and Water Conference, 2014 5. F. Gandoman, J. Van Mierlo, A. Ahmadi, S. Abdel Aleem, Chapter 15: Safety and reliability evaluation for electric vehicles in modern power system networks, Distributed Energy Resources in Microgrids, 2019, Pages 389-404 6. F. Michael Ashby, Case Study: Electric Cars, Materials and Sustainable Development, 2016 7. O. Lindov, Sigurnost u cestovnom saobraćaju, Fakultet za saobraćaj i komunikacije Univerziteta u Sarajevu, Sarajevo, 2008. 8. O. Lindov, Transport i okoliš, Fakultet za saobraćaj i komunikacije Univerziteta u Sarajevu, Sarajevo, 2011. 9. O. Lindov, A. Omerhodžić, Dijagnostika i održavanje cestovnih vozila (skripta predavanja i vježbi), Fakultet za saobraćaj i komunikacije Univerziteta u Sarajevu, Sarajevo, 2015. 10. S. Dacić, Osnovi mašinstva, Fakultet za saobraćaj i komunikacije Univerziteta u Sarajevu, Sarajevo, 2007. 11. S. Dacić, M. Trobradović, B. Pikula, Osnovi dinamike vozila – zbrika zadataka, Mašinski fakultet Univerziteta u Sarajevu, 2008. 12. S. Narla, The evolution of connected vehicle technology: From smart drivers to smart cars to selfdriving cars. Institute of Transportation Engineers. ITE Journal, 2013, 83.7: 22. 13. V. Issakov Microwave Circuits for 24 GHz Automotive Radar in Silicon-based Technologies Springer Verlag, Berlin Heidelberg, 2010. Dopunska: 1. C. Urmson, et al, Self-driving cars and the urban challenge. IEEE Intelligent Systems, 2008, 23.2. 2. O. Lindov, A. Omerhodžić, Održivi razvoj i okolišni inžinjering (skripta predavanja i vježbi), Fakultet za saobraćaj i komunikacije Univerziteta u Sarajevu, Sarajevo, 2018. 3. V. Jain, P.Heydari Automotive Radar Sensors in Silicon Technologies Springer, New York, London, 2013. 4. W. Mitchell, R. Chin, A. Sevtsuk, Chapter 11 - The Media Laboratory City Car: A New Approach to Sustainable Urban Mobility, Urban Energy Transition, 2008 pp: 267-282

Šifra predmeta: **09-10-9TRTES020102**	**Naziv predmeta:** **E-VOZILA U JAVNOM PRIJEVOZU I E-CAR SHARING**		
Ciklus: II	**Godina: I**	**Semestar: II**	**Broj ECTS kredita: 6**

<table>
<tr><td colspan="2">Status: Izbornı predmet</td><td>Ukupan broj sati: 3+2+1
Predavanja:3
Vježbe:2
Laboratorijske vježbe:1</td></tr>
<tr><td>Učesnici u nastavi</td><td colspan="2">Nastavnici i saradnici izabrani na oblast kojoj predmet pripada/predmet</td></tr>
<tr><td>Preduslov za upis:</td><td colspan="2">NE</td></tr>
<tr><td>Cilj (ciljevi) predmeta:</td><td colspan="2">Omogućiti studentima sticanje temeljnih stručnih znanja i vještina o primjeni električnih vozila u javnom prevozu, kao i sistemu E-car sharinga. Cilj predmeta je osposobiti studente za razumijevanje, analizu i primjenu koncepta elektromobilnosti u javnom prevozu u cilju razvijanja i promocije koncepta održive urbane mobilnosti.</td></tr>
<tr><td>Tematske jedinice:
(po potrebi plan izvođenja po sedmicama se utvrđuje uvažavajući specifičnosti organizacionih jedinica)</td><td colspan="2">1. Pregled zakonske regulative vezane za E vozila i sisteme E-car sharing-a.
2. Električna vozila u javnom prijevozu, upotreba i komparativna analiza.
3. Baterije za električna vozila sa fokusom na električne autobuse i teretna vozila.
4. Punionice za električna vozila, klasifikacija, performanse i rizici.
5. Sigurnosni aspekt električnih vozila.
6. Parametri transportnog učinka električnih vozila.
7. Uređaji za testiranje elektronskih sistema u vozilu.
8. Efikasnost promjene konvencionalnog voznog parka sa električnim.
9. Aaliza uređaja i aplikacija koje omogućavaju primjenu sistema e-car sharing.
10. Određivanje efikasnosti i rentabilnosti sistema e-car sharing.
11. Organizacija i determinizacija lokacija za sisteme e-car sharing-a.
12. Vlasništvo e-car sharing sistema, osiguranje i odgovornosti.
13. Upravljanje i organizacija E-car sharing sistema.
14. Regulativa i podrška integraciji E-car sharing-a u sistem javnog prevoza.
15. Uloga i značaj Smart Grid tehnologija u javnom prevozu i E-car sharing sistemu.</td></tr>
<tr><td>Ishodi učenja:</td><td colspan="2">Sticanje znanja i vještina za osposobljenost sveobuhvatnog razumijevanja koncepta elektromobilnosti i E-car sharing-a u javnom prevozu. Osposobljenost za praktičnu primjenu stečenih znanja u realnim situacijama. Razvoj inicijativa, elektromobilnosti i E-car sharing-a u javnim prevozu. Sticanje znanja za implementaciju i upravljanje konceptom elektromobilnosti i E-car sharing-a. Sticanje znanja za Smart Grid tehnologija u javnom prevozu i E-car sharing sistema.</td></tr>
<tr><td>Cilj održivog razvoja (SDG):</td><td colspan="2">SDG7 – Osigurati pristup pouzdanoj, održivoj i suvremenoj energiji po pristupačnim cijenama za sve
SDG9 – Osigurati pristup pouzdanoj, održivoj i suvremenoj energiji po pristupačnim cijenama za sve
SDG11 – Učiniti gradove i naselja inkluzivnim, sigurnim, prilagodljivim i održivim
SDG13 – Poduzeti hitne akcije u borbi protiv klimatskih promjena i njihovih posljedica</td></tr>
<tr><td>Metode izvođenja nastave:</td><td colspan="2">Predavanja popraćena multimedijalnim prezentacijama.
Auditorne vježbe sa analizom konkretnih primjera iz prakse.</td></tr>
<tr><td>Metode provjere znanja sa strukturom ocjene:</td><td colspan="2"><table><tr><td>Aktivnost u toku predavanja</td><td>-</td><td>Pismeni ispit</td><td>50</td></tr></table></td></tr>
</table>

	Praktična nastava	-	Usmeni ispit	-
	Kolokvijumi	35		
	Seminarski rad	15		
	Ukupno		Ukupno	100

Literatura:

1. A. Sbihi and R. W. Eglese, Combinatorial optimization and Green Logistics, 4OR-A Quarterly Journal of Operations Research, 2007
2. Basarić, V.: Model upravljanja raspodelom putovanja na vidove prevoza u funkciji održivog razvoja, Doktorska disertacija, Fakultet tehničkih nauka, Univerzitet u Novom Sadu, 2010.
3. Dalkmann H., Brannigan C.: Transport and climate change, Modul 5e: Sustainable transport: A sourcebook for policy-makers in developing cities, Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH, Eschborn, Germany. 2007.
4. Gwilliam, K. (ed): Cities on the Move: A World Bank Urban Transport Strategy Review, Strategy Paper, Washington, DC: World Bank, 2001.
5. Integracija vozila na električni pogon (elektromobila) u elektroenergetski sistem i njihov utjecaj na poboljšanje kvaliteta zraka u dijelu Grada Sarajeva, Institut za saobraćaj i komunikacije d.o.o. Sarajevo, 2017
6. J.-M. Timmermans, J. Matheys, J. V. Mierlo and P. Lataire, Environmental rating of vehicles with different fuels and drive trains: A univocal and applicable methodology, European Journal of Transport and Infrastructure Research, 2006
7. K. Krawiec, S. Markusik, G. Sierpiński, Electric Mobility in Public Transport—Driving Towards Cleaner Air, Intelligent Transportation and Infrastructure, 2021
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9. Lah, O.: Sustainable Urban Mobility Pathways, Wuppertal Institute for Climate, Environment and Energy & Climate Action Implementation Facility, Berlin, Germany, 2019.
10. Legal regulation of national and lower levels
11. Lindov O., Pikula B.: Electromobility models and sustainable urban development – Sarajevo case study, International Conference Towars a Human City, 2019.
12. M. Mustafa, Planiranje u saobraćaju, prevozu i komunikacijama, Univerzitet u Sarajevu, Fakultet za saobraćaj i komunikacije, 2017
13. Međunarodni i europski standardi u oblasti električnih vozila
14. P. Eng., N. Enge, S. Zoepf, Electric Vehicle Engineering, 1st Edition, McGraw Hill, 2021
15. Zietsman J., Rilett L. R.: Sustainable Transportation: Conceptualization and Performance Measures, Report No. SWUTC/02/167403-1, Texas Transportation Institute, The Texas A&M University System College Station, Texas. 2002.

Šifra predmeta: **09-10-10TRTES020102**	**Naziv predmeta:** **PROPISI I KLASIFIKACIJA U TRANSPORTU OPASNIH MATERIJA**		
Ciklus: II	**Godina: I**	**Semestar: II**	**Broj ECTS kredita: 6**

Status: Izbornı predmet	**Ukupan broj sati: 3+2+1** Predavanja:3 Vježbe:2 Laboratorijske vježbe:1
Učesnici u nastavi	**Nastavnici i saradnici izabrani na oblast kojoj predmet pripada/predmet**
Preduslov za upis:	NE
Cilj (ciljevi) predmeta:	Ciljevi kursa su da studentima pruži sveobuhvatno razumijevanje TDG propisa, klasifikacija i zahtjeva usklađenosti kako bi se osigurao siguran i usklađen transport opasnih materija.
Tematske jedinice: *(po potrebi plan izvođenja po sedmicama se utvrđuje uvažavajući specifičnosti organizacionih jedinica)*	Teorijska nastava: 1. Uvod u propise i ciljeve TDG 2. Zainteresovane strane u TDG: Uloge i odgovornosti 3. Sistemi klasifikacije opasnih materija 4. Zahtjevi za pakovanje, označavanje i označavanje 5. Dokumentacija i obaveze izvještavanja u TDG 6. Sigurnosna razmatranja i upravljanje rizikom u TDG 7. Uloge i odgovornosti otpremnika, prevoznika i primaoca 8. Procedure hitnog odgovora u TDG 9. Globalni napori harmonizacije u TDG propisima 10. Uticaj na životnu sredinu i održivost u TDG 11. Izuzeci i posebne odredbe u TDG 12. Pravne posljedice i kazne u TDG 13. Programi i strategije obuke za podizanje svijesti o TDG 14. Studije slučaja: Primjena propisa TDG u praktičnim situacijama 15. Pregled i završetak kursa: ključni koncepti i buduća razmatranja Praktična nastava: Kurs će sadržavati praktične komponente kao što su laboratorijske sesije i terenske posjete, gdje će studenti imati praktično iskustvo korištenja mjerne opreme i softverskih paketa za primjenu stečenog teorijskog znanja. Ove praktične aktivnosti će ojačati razumijevanje i omogućiti studentima da implementiraju TDG propise i sisteme klasifikacije u stvarnim scenarijima.
Ishodi učenja:	– Razumijevanje propisa TOG, – Razumijevanje principe propisa TOG, – Razumijevanje ciljeve i zakonske okvire propisa TOM, – Primenjena sistema i kriterijuma klasifikacije za tačnu identifikaciju Opasnih materija – Primenjena sistema i kriterijuma klasifikacije za tačnu identifikaciju za klasifikaciju za bezbjedan transport, – Primenjena sistema i kriterijuma klasifikacije za tačnu identifikaciju za klasifikaciju u skladu sa zahtjevima za pakovanje, obilježavanje. – Primenjena sistema i kriterijuma klasifikacije za tačnu identifikaciju za klasifikaciju za pravilno rukovanje i komunikaciju opasnim materijama. – Educiranost i stručnost u dokumentovanju, izvještavanju i procedurama reagovanja u hitnim slučajevima za incidente TOM – Analizirati i procijeniti sigurnosna razmatranja, rizike i uticaje na životnu sredinu TOM – Implementiranje održive prakse i globalne napore za harmonizaciju TOM.
Cilj održivog razvoja (SDG):	SDG3 – Osigurati zdrav život i promovirati blagostanje svih ljudi, svih životnih dobi

<table>
<tr><td></td><td>SDG9 – Izgraditi izdržljivu infrastrukturu, promovirati uključivu i održivu industrijalizaciju i poticati inovativnost
SDG11 – Učiniti gradove i naselja inkluzivnim, sigurnim, prilagodljivim i održivim
SDG13 – Poduzeti hitne akcije u borbi protiv klimatskih promjena i njihovih posljedica</td></tr>
<tr><td>Metode izvođenja nastave:</td><td>– Predavanje sa multimedijalnom prezentacijom
– Auditorijum i laboratorijske vježbe</td></tr>
<tr><td>Metode provjere znanja sa strukturom ocjene:</td><td>
<table>
<tr><th colspan="4">Ocjena znanja (maksimalni broj poena: 100)</th></tr>
<tr><td>Predispitni zahtjevi</td><td>krediti</td><td>Završni ispit</td><td>krediti</td></tr>
<tr><td>Aktivnost tokom predavanja</td><td></td><td>Pismeni ispit</td><td>50</td></tr>
<tr><td>Praktična nastava</td><td></td><td>Usmeni ispit</td><td></td></tr>
<tr><td>Kolokvijumi</td><td>35</td><td></td><td></td></tr>
<tr><td>Seminarski rad/projekat</td><td>15</td><td></td><td></td></tr>
<tr><td>Ukupno kredita</td><td></td><td>Ukupno kredita</td><td>100</td></tr>
</table>
</td></tr>
<tr><td>Literatura:</td><td>

Prevoz opasnih materija: Vodič kroz model propisa UN, Ujedinjene nacije
IMDG kod: Međunarodni kodeks o opasnim pomorskim teretima, Međunarodna pomorska organizacija (IMO), 2022.
IATA propisi o opasnim teretima, Međunarodno udruženje zračnog transporta (IATA), 2023
ADR: Evropski sporazum o međunarodnom drumskom prevozu opasnih materija, Ekonomska komisija Ujedinjenih nacija za Evropu (UNECE), 2023.
Uredba o međunarodnom željezničkom prijevozu opasnih materija (RID), Međuvladina organizacija za međunarodni željeznički prijevoz, 2023.
ADN: Evropski sporazum o međunarodnom prevozu opasnih materija unutrašnjim plovnim putevima, Ujedinjene nacije, 2021.
JJ Keller & Associates, Pocketbook o usklađenosti sa opasnim materijalima, 2022
Vodič za hitne slučajeve (ERG), Ministarstvo saobraćaja SAD (DOT), 2020
Alija Behmen, Sabira Salihović, Materijali i robe u transportu – Knjiga I, Univerzitet u Sarajevu, Fakultet saobraćaja i komunikacija, 2007.
Alija Behmen, Sabira Salihović, Materijali i robe u transportu – Knjiga I, Univerzitet u Sarajevu, Fakultet saobraćaja i komunikacija, 2008.
Pravna regulativa na nacionalnom i nižim nivoima
Interna obrazovna dokumenta Fakulteta za saobraćaj i komunikacije

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<table>
<tr><td>Šifra predmeta:
13-14-15-1TRTES020203</td><td colspan="3">Naziv predmeta:
ELEMENTI EKSPERTIZA SAOBRAĆAJNIH NEZGODA</td></tr>
<tr><td>Ciklus: II</td><td>Godina: II</td><td>Semestar: III</td><td>Broj ECTS kredita: 6</td></tr>
<tr><td colspan="2">Status: Izborni predmet</td><td colspan="2">Ukupan broj sati: 90
Razraditi distribuciju sati po tipu:
Predavanja: 30, Vježbe: 30, Seminar: 10, Terenski rad: 10, Laboratorijske vježbe: 5, Praksa: 5.</td></tr>
<tr><td>Učesnici u nastavi</td><td colspan="3">Nastavnici i saradnici izabrani na oblast kojoj predmet pripada/predmet</td></tr>
</table>

Preduslov za upis:	NE
Cilj (ciljevi) predmeta:	Sticanje edukacijskih oblika u realizaciji programa iz oblasti ekspertiza saobraćajnih nezgoda, te analiza konkretnih saobraćajnih nezgoda.
Tematske jedinice: *(po potrebi plan izvođenja po sedmicama se utvrđuje uvažavajući specifičnosti organizacionih jedinica)*	1. Uvod – osnove elemenata ekspertiza saobraćajnih nezgoda, uputstvo za izradu ekspertize saobraćajne nezgode 2. Zapisnik o saobraćajnoj nezgodi 3. Skica saobraćajne nezgode 4. Foto-dokumentacija uviđaja saobraćajne nezgode 5. Tragovi saobraćajne nezgode na kolovozu 6. Tragovi saobraćajne nezgode na vozilu 7. Ostali tragovi saobraćajnih nezgoda 8. Nalet motornih vozila na pješaka 9. Sudari motornih vozila 10. Izlijetanje motornih vozila 11. Saobraćajne nezgode sa biciklistima 12. Karakteristični primjeri saobraćajnih nezgoda 13. Izrada ekspertize saobraćajne nezgode – primjeri određivanja mjesta kontakta i brzina 14. Izrada ekspertize saobraćajne nezgode – primjeri vremensko-prostorne analize saobraćajne nezgode 15. Izrada ekspertize saobraćajne nezgode – primjeri dinamike nastanka saobraćajne nezgode
Ishodi učenja:	Znanje: Teorijska i praktična znanja iz oblasti ekspertiza saobraćajnih nezgoda. Osnovna pravila, metode i postupci u oblasti izrade analiza i ekspertiza konkretnih saobraćajnih nezgoda. Vještine: Sposobnost primjene teorijskih i praktičnih znanja u oblasti analiza i ekspertiza saobraćajnih nezgoda. Kompetencije: Sposobnosti samostalnog razumijevanja i korištenja stručne literature, primjene metoda i postupaka, korištenje softverskih alata u izradi analiza i ekspertiza konkretnih saobraćajnih nezgoda.
Cilj održivog razvoja (SDG):	"SDG3 – Zdravlje i blagostanje"; "SDG9 – Industrija, inovacije i infrstruktura"; "SDG11 – Održivi gradovi i zajednice"; "SDG16 – Mir, pravda i snažne institucije".
Metode izvođenja nastave:	Usmeno iznošenje sa prezentacijom i prikazom različitih vrsta saobraćajnih nezgoda uz korištenje video i audio zapisa, softvera, simulatora, te samostalno izlaganje pojedinih konkretnih saobraćajnih nezgoda. Iniciranje rasprava i diskusija o problemima iz prakse, pojedinačnih zapažanja iz različitih okruženja, izrada samostalnih analiza i ekspertiza saobraćajnih nezgoda.
Metode provjere znanja sa strukturom ocjene:	Ocjena aktivnosti na nastavi i vježbama uz izradu samostalnih radova, ocjena parcijalnog testa u toku nastave kao i ocjena završnog ispita. Kriterijum praćenja rada i ocjenjivanja studenta u toku nastave i to prema sljedećem načinu: – Seminarski rad/Terenski rad/Lab.vježbe/Praksa/ (pismena i usmena provjera) 15 bodova (%), položeno ako se osvoji preko 50 %. – I Parcijalni ispit/test/provjera znanja/ (pismena provjera) 35 bodova (%), položen je ako se osvoji preko 50 %. – Završni ispit (II Parcijalni) (pismena provjera) 50 bodova (%), položeno ako se osvoji preko 50 %. – Završni ispit (Integralni) (pismena provjera) 85 bodova (%), položeno ako se osvoji preko 50 %. Ukupan broj bodova (%) koji student prema navedenom praćenju u toku nastave može ostvariti iznosi maksimalno 50 bodova (%), što sa

	Završnim (II parcijalnim) čini 100 bodova (%). Za studente koji nisu položili I Parcijalni ispit, Završni ispit (Integralni) se organizuje iz cjelokupnog pređenog gradiva u toku nastave i vježbi, i vrednuje se sa 85 bodova (%), što sa seminarskim radom/praktičnim radom čini 100 bodova (%). Studenti da bi položili ispit, trebaju položiti svaki od navedenih dijelova i to: seminarski rad, prvi parcijalni ispit (test) i završni ispit (drugi parcijalni ili integralni). Evaluacija seminarskog rada i prvog parcijalnog ispita (testa) se realizira u toku trajanja nastave. Studenti ponovci koji u prethodnoj akademskoj godini nisu položili ispit, a koji su ispunili određene obaveze i ostvarili određene bodove, iste mogu prenijeti u tekuću akademsku godinu. Studenti ponovci koji žele izvršiti prenos bodova, trebaju informisati predmetnog nastavnika na početku semestra, do kraja prve sedmice nastave. Prenos bodova se može izvršiti samo jednom. Konačan uspjeh studenta nakon svih predviđenih oblika provjere znanja, vrednuje se i ocjenjuje sistemom ocjenjivanja kako slijedi: a) 10 (A) - izuzetan uspjeh bez grešaka ili sa neznatnim greškama, nosi 95-100 bodova; b) 9 (B) - iznad prosjeka, sa ponekom greškom, nosi 85-94 bodova; c) 8 (C) - prosječan, sa primjetnim greškama, nosi 75-84 bodova; d) 7 (D) - općenito dobar, ali sa značajnijim nedostacima, nosi 65-74 bodova; e) 6 (E) - zadovoljava minimalne uslove, nosi 55-64 bodova; f) 5 (F, FX) - ne zadovoljava minimalne uslove, manje od 55 bodova. Ukupno vrednovanje svih obaveza studenta u toku semestra, odnosno ocjena na ispitu zasnovana je na ukupnom broju bodova (%) koje je student stekao ispunjavanjem predispitnih obaveza i polaganjem parcijalnog i završnog ispita, a prema kvalitetu stečenih znanja i vještina, i sadrži maksimalno 100 bodova, te se utvrđuje prema sljedećoj skali: <u>Obaveze studenta Bodovi (%)</u> Prisutnost na predavanjima i vježbama ..... 0 bodova Obavezno je prisustvo svim oblicima nastave min. 80 % i ovo je uslov za ovjeru/potpis urednog pohađanja nastave. Seminarski rad/Terenski rad/Lab.vježbe/Praksa (pism. i usm.)...15 bodova (%) I Parcijalni ispit/Test/Provjera znanja (pismeno).....35 bodova (%) Završni ispit (II Parcijalni) (pismeno) .....50 bodova (%) Završni ispit (Integralni) (pismeno).....85 bodova (%)
Literatura:	Obavezna: 1. Lindov, O.: Sigurnost u cestovnom saobraćaju, Univerzitetski udžbenik, Fakultet za saobraćaj i komunikacije, Sarajevo, 2008. 2. Lindov, O., Omerhodžić, A., Elementi ekspertiza saobraćajnih nezgoda, skripta predavanja, Fakultet za saobraćaj i komunikacije, Sarajevo, 2013. 3. Lindov, O., Omerhodžić, A., Elementi ekspertiza saobraćajnih nezgoda, skripta vježbi i testova, Fakultet za saobraćaj i komunikacije, Sarajevo, 2013. 4. Lindov, O.: Simulacioni modeli pri naletu motornog vozila na pješaka, Magistarski rad, Fakultet za saobraćaj i komunikacije, 1998. 5. Lindov, O.: Ekspertize saobraćajnih nezgoda, Fakultet za saobraćaj i komunikacije, Sarajevo, 1998-2006. 6. Lindov, O.: Prilog izučavanju naleta motornog vozila na pješaka, Doktorska disertacija, Fakultet za saobraćaj i komunikacije, maj 2002.

	7. Lindov, O., Priručnik za jačanje kapaciteta profesije bezbjednosti saobraćaja, Fakultet za saobraćaj i komunikacije Univeziteta u Sarajevu, Erasmus+ projekat Trafsaf, Sarajevo, 2020. 8. Rotim F.: Elementi sigurnosti cestovnog prometa- Svezak 1 – Ekspertize prometnih nezgoda, Suvremeni promet, Zagreb, 1990. Dopunska: 1. Rotim F.: Elementi sigurnosti cestovnog prometa- Svezak 2 – Kinetika vozila, Suvremeni promet, Zagreb, 1991. 2. Rotim F.: Elementi sigurnosti cestovnog prometa- Svezak 3 – Sudari vozila, Suvremeni promet, Zagreb, 1992. 3. Dragač R.: Bezbednost drumskog saobraćaja – Knjiga III, Saobraćajni Fakultet, Beograd 1994. 4. Čović M., Zečević D.: Vještačenja u cestovnom prometu, Informator, Zagreb, 1987. 5. Golubić J.: Osnove tehnike i sigurnosti prometa, Fakultet prometnih znanosti, Zagreb, 1992. 6. PC CRASH, Simulation Program for Vehicle Accidents, Linz Austrija. 7. Accident Reconstruction Newsletter, San Diego, Canada.

Šifra predmeta: 13-14-15-2TRTES020203	**Naziv predmeta: UPRAVLJANJE I ORGANIZACIJA LOGISTIČKIH CENTARA U SAOBRAĆAJU I TRANSPORTU**		
Ciklus: II	**Godina: II**	**Semestar: III**	**Broj ECTS kredita: 6**
Status: Izborni predmet		**Ukupan broj kontakt sati: 90** Opciono razraditi distribuciju sati po tipu: Predavanja: 45 Vježbe: 30 Seminarski/projektni zadatak: 15	
Učesnici u nastavi	**Nastavnici i saradnici izabrani na oblast kojoj predmet pripada/predmet**		
Preduslov za upis:	NE		
Cilj (ciljevi) predmeta:	Sticanje osnovnih znanja o upravljanju i organizaciji logističkih centara, tehnološkim promjenama u logističkim centrima, zahtjevima u organizaciji i razvoju modernih logističkih centara.		
Tematske jedinice: *(po potrebi plan izvođenja po sedmicama se utvrđuje uvažavajući specifičnosti organizacionih jedinica)*	1. Historijske osnove razvoja nauke o organizaciji i principi upravljanja. 2. Pojam definicija predmet i metod nauke o organizaciji. 3. Moderne teorije organizacije i upravljanja. 4. Koncepti i tipovi logističke organizacije. 5. Logistički provajderi. 6. Upravljanje transportom. 7. Nova logistička strategija snadbjevanja, distribucije i očekivanja kupca korisnika usluga. 8. Faktori koji utječu na organizacionu strukturu zadataka logistike. 9. Logistički centri. Mogući oblici logističkih centara. 10. Kriterijumi za izbor lokacije logističkih centara. 11. Efekti razvoja logističkih centara. 12. Logistički centri kao strateški značajan faktor povećanja kvaliteta usluga. 13. Savremeni koncept razvoja logističkih centara. 14. Upravljanje ljudskim resursima kao funkcija menadžmenta. 15. Pravci razvoja transporta i logističkih usluga u Bosni i Hercegovini		

Ishodi učenja:	Znanje: Studenti kroz nastavni proces predavanja, vježbe, seminarski rad trebaju steći odgovarajuća znanja i iskustva u oblasti upravljanja i organizacije logističkim centrima i terminalima. Predmet proučavanja treba da osigura kritičan nivo kompetencija i znanja potrebnih za rješavanje konkretnih problema u oblasti upravljanja, organizacije i planiranja logističkih centara. Vještine: Nakon završetka kursa studenti će biti sposobni da razumije procese upravljanja logističkim centrima, procijene odgovarajuće metode u procesu upravljanja, procijeni odgovarajuće metode u procesu organizacije rada logističko distributivnih centara. Kompetencije**:** Aplikaciju stečenih znanja u konkretnim modelima
Cilj održivog razvoja (SDG):	SDG 8 - Dostojanstven rad i ekonomski rast: Promovisati održivi, uključivi i održivi ekonomski rast, zapošljavanje i dostojanstven rad za sve; SDG 9 - Industrija, inovacije i infrastruktura: Izgraditi otpornu infrastrukturu, promovirati uključivu i održivu industrializaciju i poticati inovacije; SDG 12 - Odgovorna potrošnja i proizvodnja: Osigurati održive obrasce potrošnje i proizvodnje.
Metode izvođenja nastave:	Nastava se realizira kroz izvođenje predavanja i vježbi. Predavanja se realizuju kroz usmeno izlaganje sa prezentacijom i prikazom primjera. Inicira diskusija o problemima upravljanja i organizacije logističkim sistemima. Studenti će biti obavezni izraditi i prezentirati seminarske radove. U realizaciji nastave se koriste različite metode koje uključuju: usmeno izlaganje i diskusije, demonstracije primjera, metoda video prikaza i potenciranje samostalnog rada primjenom odgovarajućih metodoloških pristupa.
Metode provjere znanja sa strukturom ocjene:	Kriterijum vrednovanja rada i ocjenjivanja studenta u toku nastave, vrši se na sljedeći način: – Prisustvo na nastavi - obavezno se vodi evidencija; – Prisustvo nastavi i vježbama se ne boduje; – Seminarski rad od 0 do 15 bodova; – I parcijalni ispit/I test/ I provjera znanja/ od 0 do 35 bodova; – Ukupan broj bodova koji student prema navedenom u toku nastave može ostvariti iznosi maksimalno 50 bodova – Završni / popravni ispit iznosi maximalno 50 bodova – Završni ispit se organizuje na način da studenti koji su položili prvu provjeru znanja polažu samo završni dio ispita (II dio gradiva), dok studenti koji nisu položili prvu provjeru znanja zajedno sa završnim polažu i prvi parcijalni ispit (I dio gradiva). Prema kvalitetu stečenih znanja i vještina student može osvojiti maksimalno 100 bodova, a prema sljedećoj skali: Seminarski rad i odbrana_____15 bodova (%) I test / I provjera znanja (I parcijalni ispit)__ 35 bodova (%) Završni test (II parcijalni ispit)_____50 bodova (%) Popravni test _____50 bodova (%) Ispit se polaže pismeno i usmeno. Napomena: Uslov da student položi prvu provjeru znanja, seminarski rad i završni ispit jeste da osvoji 50% i više od maximalno mogućeg broja bodova. Navedena skala se može korigovati prema Pravilima studiranja na Univerzitetu u Sarajevu (Član 45). Napomena: Studenti su obavezni prisustvovati svim oblicima nastave

	minimalno 80 % od ukupnog fonda sati. Student može, u opravdanim slučajevima (bolest) odsustvovati sa nastave, za što je obavezan dostaviti zdravstveno opravdanje. Seminarski rad i domaća zadaća će biti bodovane samo ako budu predane prema definisanim terminima. Naknadne predaje istih neće se bodovati.
Literatura:	Obavezna: 1. Bilješke i slajdovi s predavanja (moći će se preuzeti na WEB site-u Fakulteta). 2. Skripta predavanja, „Upravljanje i organizacija logističkih centara u saobraćaju i transportu“, Fakultet za saobraćaj i komunikacije, 2024. godine Dopunska: 1. ČEKIĆ, Š., BOŠNJAK, I.: Menadžment u transportu i komunikacijama, Univerzitet u Sarajevu - Sveučilište u Zagrebu, Sarajevo - Zagreb, 2000. 2. IVAKOVIĆ, Č.: TERMINALI, Fakultet prometnih znanosti, Zagreb, 2006. 3. AČIMOVIĆ, S.: Marketing logistika, Ekonomski fakultet, Beograd, 2004. 4. ZELENIKA, R.: Logistički sustavi, Ekonomski fakultet u Rijeci, 2005. 5. PERIŠIĆ, R.,A.: Sistem kvaliteta usluga logistika i informatika, Beograd, 2002. 6. BAHTJAREVIĆ-ŠIBER, F.: Managment ljudskih potencijala, Golden Marketing, Zagreb, 1999. 7. BOŽIĆ, V., RAKIĆ, S.: Poslovna logistika, Ekonomski fakultet, Beograd, 1997. 8. The Handbook of Logistics and Distribution Management: Understanding the Supply Chain Fifth Edition, 2006.

Šifra predmeta: **13-14-15-3TRTES020203**	**Naziv predmeta:** **TRANSPORTNE MREŽE U CESTOVNOM SAOBRAĆAJU**		
Ciklus: II	**Godina: II**	**Semestar: III**	**Broj ECTS kredita: 6**
Status: Izborni predmet		**Ukupan broj sati: 150** Opciono razraditi distribuciju sati po tipu: Predavanja 45 Vježbe 30 Laboratorijske vježbe 15 Seminar 30 Samostalni rad 30	
Učesnici u nastavi	**Nastavnici i saradnici izabrani na oblast kojoj predmet pripada/predmet**		
Preduslov za upis:	Ne		
Cilj (ciljevi) predmeta:	Sticanje edukacijskih oblika u realizaciji programa iz transportnih mreža u cestovnom saobraćaju. Sticanje znanja i vještina iz transportnih mreža u cestovnom saobraćaju.		

Tematske jedinice:

(po potrebi plan izvođenja po sedmicama se utvrđuje uvažavajući specifičnosti organizacionih jedinica)

R.b.	Nastavne cjeline	Broj sati (P+V+L+S+Sr)
1.	Osnove planiranja u mrežama i mrežnog planiranja	2 x (3+2+1+2+2)
2.	Zahtjevi i kapaciteti u prevoznim,	(3+2+1+2+2)

		saobraćajnim i komunikacijskim mrežama	
	3.	Ponuda usluga u saobraćajnim, prevoznim i komunikacijskim mrežama	2 x (3+2+1+2+2)
	4.	Metode optimizacije na mreži saobraćajnica	4 x (3+2+1+2+2)
	5.	Metode optimizacije prevoza na mreži saobraćajnica	4 x (3+2+1+2+2)
	6.	Realni sistem i mreže saobraćajnica	(3+2+1+2+2)
	7.	Osnove metoda simulacije u analizi mreža	(3+2+1+2+2)

Ishodi učenja:	Studenti kroz nastavni proces predavanja, vježbi i praktičan rad trebaju steći odgovarajuća znanja vezano za mreže u saobraćaju i komunikacijama. Izučavanje i praktična primjena, treba da osigura potreban nivo znanja studentima da mogu uspješno optimalno planirati, organizovati i upravljati procesima u prevozu, saobraćaju i komunikacijama na mrežama određenih vidova saobraćaja i prevoza.
Cilj održivog razvoja (SDG):	Cilj 4: Osigurati inkluzivno i kvalitetno obrazovanje, te promovirati mogućnosti cjeloživotnog učenja za sve ljude, svih životnih dobi Cilj 9: Industrija, inovacije i infrastruktura Cilj 11: Održivi gradovi i zajednice Cilj 12: Održiva potrošnja i proizvodnja Cilj 13: Klimatska akcija
Metode izvođenja nastave:	Predavanja, vježbe i izrada seminarskog rada sa praktičnim osvrtom. Analitički i demonstracioni pristup.
Metode provjere znanja sa strukturom ocjene:	Praćenje rada studenta se vrši dodjeljivanjem bodova za svaki oblik aktivnosti i provjere znanja u toku semestra, kao i na završnom ispitu nakon završetka semestra prema sljedećim elementima praćenja: – Domaća zadaća/seminarski rad/praktični rad/ 15 bodova (%), vrednuje se ako je položeno preko 50 % – I Parcijalni ispit/I test/I provjera znanja/35 bodova (%), vrednuje se ako je položeno preko 50 % – Završni ispit (II Parcijalni) 50 bodova (%), vrednuje se ako je položeno preko 50%. – Završni ispit (Integralni) 85 bodova (%), vrednuje se ako je položeno preko 50%. Ukupan broj bodova (%) koji student prema navedenom praćenju u toku nastave može ostvariti iznosi maksimalno 50 bodova (%), što sa Završnim (II parcijalnim) čini 100 bodova (%). Za studente koji nisu položili I Parcijalni ispit, Završni ispit (Integralni) se organizuje iz cjelokupnog pređenog gradiva u toku nastave i vježbi vrednuje se sa 85 bodova (%), što sa seminarskim radom/praktičnim radom čini 100 bodova (%). Konačan uspjeh studenata nakon svih predviđenih oblika provjere znanja, vrednuje se i ocjenjuje sistemom ocjenjivanja kako slijedi: a) 10 (A) - izuzetan uspjeh bez grešaka ili sa neznatnim greškama, nosi 95-100 bodova; b) 9 (B) - iznad prosjeka, sa ponekom greškom, nosi 85-94.99 boda; c) 8 (C) - prosječan, sa primjetnim greškama, nosi 75-84,99 boda; d) 7 (D) - općenito dobar, ali sa značajnim nedostacima, nosi 65-74,99 boda; e) 6 (E) - zadovoljava minimalne uslove, nosi 55-64,99 boda; f) 5 (F, FX) - ne zadovoljava minimalne uslove, manje od 55 bodova.
Literatura:	Obavezna:

	1. Mehanović, M., 2015. „Mreže u saobraćaju, prevozu i komunikacijama“. Fakultet za saobraćaj i komunikacije u Sarajevu, Sarajevo. 2. Sinković, V.: Informacijske mreže, Školska knjiga Zagreb, Zagreb, 1994. Dopunska: 1. Teodorović, D.: Transportne mreže, Savez inženjera i tehničara saobraćaja i veza Jugoslavije, Beograd, 1983. 2. Suruliz, K., Hadžialić, M., Statistička teorija telekomunikacija, Univerzitetski udžbenik, Elektrotehnički fakultet Sarajevo, 2009. 3. HCM2000; Capacity Manual, Special Report 209, Transportation Research Board, Washington D.C., 1994.

Šifra predmeta: **13-14-15-4TRTES020203**	**Naziv predmeta:** **METODOLOGIJA ISTRAŽIVAČKOG I NAUČNOG RADA**		
Ciklus: II	**Godina: II**	**Semestar: III**	**Broj ECTS kredita: 6**
Status: Izborni predmet		**Ukupan broj kontakt sati: 90** Predavanja: 45 Vježbe: 30 Seminari i projektni zadaci: 15	
Učesnici u nastavi	**Nastavnici i saradnici izabrani na oblast kojoj predmet pripada/predmet**		
Preduslov za upis:	NE		
Cilj (ciljevi) predmeta:	Studenti kroz nastavni proces predavanja, vježbe, seminarski rad i praktičan rad trebaju steći odgovarajuća osnovna i dodatna znanja iz oblasti metodologije naučnog i stručnog rada. Predmet „Metodologija istraživačkog i naučnog rada“ treba da osigura nivo znanja o svim načelima, metodama, ciljevima, instrumentima istraživačkog i naučnog rada kao i način definisanja i implementacije izrade naučnih i stručnih radova.		
Tematske jedinice: *(po potrebi plan izvođenja po sedmicama se utvrđuje uvažavajući specifičnosti organizacionih jedinica)*	1. Uvod u metodologiju istraživačkog rada. Funkcija istraživačkog rada. 2. Znanost o naukama. Definicija znanosti. 3. Osnovna obilježja znanosti. 4. Funkcije znanosti – istraživački rad: Funamentalna istraživanja 5. Primjenjena istraživanja. Razvojna istraživanja. Individualna i timska istraživanja. 6. Osnovne metode istraživanja. 7. Klasifikacija i selekcija metoda. 8. Tehnologija istraživačkog rada, uočavanje istraživačkog problema i njegova funkcija. 9. Izbor i analiza teme. 10. Sastavljanje radne biografije: priručnici, enciklopedije, rječnici, monografije. 11. Kako se definira predmet i cilj istraživanja? 12. Šta je istraživački rezultat i kako se verificira? 13. Pisanje i prezentacija izvještaja istraživačkog rada. 14. Koncept, uvod, izlaganje problema, argumentacija i diskusija rezultata. 15. Pisanje izbora metode istraživanja. 16. Pisanje magistarskih radova		
Ishodi učenja:	Znanje: Teorijska i praktična znanja iz oblasti naučne i istraživačke		

	djelatnosti. Predmet proučavanja treba da osigura nivo kompetencija i znanja potrebnih za rješavanje svakodnevnih problema u navedenoj oblasti. Vještine: Sposobnost primjene teorijskih i praktičnih znanja iz oblasti naučne i istraživačke djelatnosti. Kompetencije: Sposobnosti samostalnog razumijevanja i korištenja znanja potrebnih za rješavanje specifičnih problema u oblasti naučne i istraživačke djelatnosti.
Cilj održivog razvoja (SDG):	SDG4 – Osigurati uključivo i kvalitetno obrazovanje te promovirati mogućnosti cjeloživotnog učenja; SDG5 – Postići rodnu ravnopravnost i osnažiti sve žene i djevojke; SDG9 – Izgraditi prilagodljivu infrastrukturu, promovirati uključivu i održivu industrijalizaciju i poticati inovativnost
Metode izvođenja nastave:	Nastava se realizira kroz izvođenje predavanja, vježbi, laboratorijskih vježbi/terenskog rada/prakse. Zastupljene su sljedeće metode: metoda usmenog izlaganja, metoda razgovora, metoda demonstracije, metoda grafičkih radova, metoda crtanja i metoda rada u skupini. Na predavanima se obrađuju teorijski koncepti i principi uz prikaz opisnih primjera i rješavanje određenih zadataka. Dodatni primjeri se razmatraju i rješavaju kroz vježbe, laboratorijske vježbe/terenski rad/praksu, što omogućava kontinuiran rad i pripremu za samostalno rješavanje problema. Na laboratorijskim vježbama/terenskom radu/praksi razvijat će se vještine potrebne za individualni i timski rad u cilju izvršavanja zadataka iz zadane oblasti.
Metode provjere znanja sa strukturom ocjene:	Ocjena kreativnosti na nastavi i vježbama uz izradu samostalnih radova, ocjena parcijalnog testa u toku nastave kao i ocjena završnog ispita. Kriterijum praćenja rada i ocjenjivanja studenta u toku nastave i to prema sljedećem načinu: – Domaća zadaća/seminarski rad/praktični rad/ 15 bodova (%), položeno ako se osvoji preko 50 %. – I Parcijalni ispit/test/I provjera znanja/35 bodova (%), položen je ako se osvoji preko 50 %. – Završni ispit (II Parcijalni) 50 bodova (%), položeno ako se osvoji preko 50 %. – Završni ispit (Integralni) 85 bodova (%), položeno ako se osvoji preko 50 %. Ukupan broj bodova (%) koji student prema navedenom praćenju u toku nastave može ostvariti iznosi maksimalno 50 bodova (%), što sa Završnim (II parcijalnim) čini 100 bodova (%). Za studente koji nisu položili I Parcijalni ispit, Završni ispit (Integralni) se organizuje iz cjelokupnog pređenog gradiva u toku nastave i vježbi, i vrednuje se sa 85 bodova (%), što sa seminarskim radom/praktičnim radom čini 100 bodova (%). Konačan uspjeh studenta nakon svih predviđenih oblika provjere znanja, vrednuje se i ocjenjuje sistemom ocjenjivanja kako slijedi: a) 10 (A) - izuzetan uspjeh bez grešaka ili sa neznatnim greškama, nosi 95-100 bodova; b) 9 (B) - iznad prosjeka, sa ponekom greškom, nosi 85-94 bodova; c) 8 (C) - prosječan, sa primjetnim greškama, nosi 75-84 bodova; d) 7 (D) - općenito dobar, ali sa značajnijim nedostacima, nosi 65-74 bodova; e) 6 (E) - zadovoljava minimalne uslove, nosi 55-64 bodova; f) 5 (F, FX) - ne zadovoljava minimalne uslove, manje od 55 bodova.

	Ukupno vrednovanje svih obaveza studenta u toku semestra, odnosno ocjena na ispitu zasnovana je na ukupnom broju bodova (%) koje je student stekao ispunjavanjem predispitnih obaveza i polaganjem parcijalnog i završnog ispita, a prema kvalitetu stečenih znanja i vještina, i sadrži maksimalno 100 bodova, te se utvrđuje prema sljedećoj skali: Obaveze studenta Bodovi (%) Prisutnost na predavanjima i vježbama. - Zadaća/Seminarski/Praksa/.....15 bodova (%) I Parcijalni ispit/Test/Provjera znanja/.....35 bodova (%) Završni ispit (II Parcijalni) .....50 bodova (%) Završni ispit (Integralni) .....85 bodova (%)
Literatura:	Obavezna: 1. Š. Čekić: Osnovi metodologije i tehnologije izrade znanstvenog istručnog djela, Fakultet za saobraćaj i komunikacije, Sarajevo,1999 2. S. Dubić: Uvođenje u naučni rad, Zavod za izdavanje udžbenika,Sarajevo 1970. 3. M.Šamić: Kako nastaje naučno djelo, Svjetlost, Sarajevo,1980. 4. M.Vujović: Uvođenje u znanstveni rad, Informator, Zagreb, 1983 5. M. Filipović: Metodologija znanosti i znanstvenog rada,Svjetlost,Sarajevo 2004. 6. V. Silubrčić: Kako sastaviti, obajaviti i ocjeniti znanstveno djelo,Zagreb, 2003. 7. L. Kuba – Dž. Koking: Metodologija izrade naučnog teksta, CID;Podgorica,2004. 8. S. Kukić: Metodologija znanstveno istraživačkog rada,Ekonomski Fakultet, Mostar 2005.

Šifra predmeta: **13-14-15-5TRTES020203**	**Naziv predmeta:** **SAOBRAĆAJNA POLITIKA**		
Ciklus: II	**Godina: II**	**Semestar: III**	**Broj ECTS kredita: 6**
Status: Izborni predmet		**Ukupan broj kontakt sati: 90** Opciono razraditi distribuciju sati po tipu: Predavanja: 45 Vježbe: 30 Seminari i projektni zadaci: 15	
Učesnici u nastavi	**Nastavnici i saradnici izabrani na oblast kojoj predmet pripada/predmet**		
Preduslov za upis:	NE		
Cilj (ciljevi) predmeta:	Studenti stiču osnovna teorijska znanja potrebna za izučavanje prometne politike: nacionalni značaj transportnog sistema i integracija u europske prometne tokove, alokacija pozitivnih i negativnih učinaka integracije saobraćajne politike. Piramidalna struktura i ingerencija prilikom definisanja i realizacije saobraćajnih prioriteta na nacionalnom i međunardonom nivou.		
Tematske jedinice: *(po potrebi plan izvođenja po sedmicama se utvrđuje uvažavajući specifičnosti organizacionih jedinica)*	1. Pristupne osnove nacionlanoj prometnoj politici: pojam politike, vrste politike, funkcija politike kao pristupna osnova nacionalne prometne politike, 2. Komponente nacionalne prometne politike: Nositelji prometne politike, ciljevi prometne politike, instrumenti prometne politike, odnos ciljeva i instrumenata prometne politike,		

	3. Načela nacionalne prometne politike – I dio: povezanosti prometa i ekonomije, usklađivanja djelovanja prometnog sustava i društvene rentabilnosti. 4. Načela nacionalne prometne politike – II dio: Načela jedinstvenog prometnog sustava, alokacije resursa, vlasništva i jednakih mogućnosti rada, izbora prometne politike i ostvarivosti prometne politike 5. Formuliranje prometne politike: Formuliranje, vrednovanje, efikasnost nacionalne prometne politike. Pojam i značenje determinanata prometne politike. 6. Usklađenost prometne politike – I dio: Ciljevi zajedničke prometne politike. Opće političke smjernice zajedničke prometne politike. 7. Usklađenost prometne politike – II dio: Primjena i rasprave o budućnosti prometa u okviru zajedničke prometne politike. 8. Transeuropska prometne mreža – I dio: Smjernice iz 1996. i revizija smjernica za transeuropsku prometnu mrežu iz 2004. godine. 9. Transeuropska prometne mreža – II dio: Revizija smjernica iz 2013. godine: integrirana mreža, dvoslojna struktura i koridori transeuropske prometne mreže. 10. Transeuropska prometne mreža – III dio: Dodatne mogućnosti financiranja projekata transeuropskih mreža. Utvrđivanje općih uvjeta za financiranje projekata transeuropskih mreža. 11. Transeuropska prometne mreža – IV dio: Instrument i opći ciljevi za povezivanje europe transeuropskom mrežom. Proračun Instrumenta za povezivanje Europe transeuropskom mrežom 12. Sektorske politike EU – I dio: Cilj i područje primjene Direktive 97/67/EZ europskog Parlamenta i Vijeća. Univerzalne poštanske usluge. 13. Sektorske politike EU – II dio: Usklađenje poštanskih usluga koje se mogu rezervirati. Uvjeti pružanja nerezerviranih poštanskih usluga i pristupa u mrežu. 14. Sektorske politike EU – III dio: Kvaliteta poštanskih usluga. Usklađenje tehničkih normi prema interesima korisnika. Odbor i nacionalno regulatorno tijelo 15. Sektorske politike EU – IV dio: Tržišna pravila poštanskog prometa i europska postignuća u oblasti poštanskog prometa.
Ishodi učenja:	Znanje: Sposobnost za kreiranje i primjenu saobraćajne politike uvažavajući postavljene predmetne ciljeve. Vještine: Identifikacija saobraćajnih I transportnih prioriteta potrebnih za strategijsko planirnje i kreiranje saobraćajne politike u mikro i makro okruženju. Defisnisati ciljeve saobraćajne politike i prihvatljive modele realizacije. Identifikuje prioritete u oblasti planiranja, izgradnje, revitalizacije prometnih tokova, izvrši procjenu potrebe za integracijom i liberalizacijom unutrašnjih prometnih tokova prateći europsku I međunarodnu prometnu politiku, direktive i smjernice kao i prometne tokove, ali i prometne tokove i politike zemalja u okruženju. Kompetencije: Krairanje unutrašnjeg efikasnog I efektivnog transportnoog sistema I integracija u međunarodne I EU transportne sisteme
Cilj održivog razvoja (SDG):	Ciljevi održivog razvoja i uticaj na saobraćajnu politiku: SDG 1 - Svijet bez siromaštva SDG 2 - Svijet bez gladi SDG 5 – Rodna ravnopravnost SDG 6 – Čista voda i sanitarni uvjeti

	SDG 7 – Pristupačna energija iz čistih izvora SDG 8 - Dostojanstven rad i ekonomski rast SDG 9 – Industrija, inovacije i infrastruktura SDG 10 – Smanjenje nejednakosti SDG 11 – Održivi gradovi i zajednice SDG 12 - Održiva ppotrošnja i proizvodnja SDG 13 – Zaštita klime SDG 14 – Očuvanje vodenog svijeta SDG 15 – Očuvanje života na zemlji SDG 16 – Mir, pravda i snažne institucije SDG 17 – Partnerstvom do cilja
Metode izvođenja nastave:	Nastava se realizira kroz izvođenje predavanja, vježbi i praktičnog dijela nastave koja uključuje izradu projektnih zadataka. Predavanja se realizuju kroz usmeno izlaganje sa prezentacijom i prikazom primjera iz prakse. Inicira diskusija o problemima planiranja, modeliranja i analize informacijskih sistema. Studenti će biti obavezni izraditi i prezentirati seminarske radove i/ili projektne zadatke. U realizaciji nastave se koriste različite metode koje uključuju: usmeno izlaganje i diskusije, demonstracije primjera, metoda grafičkih i video prikaza i potenciranje rada u grupama primjenom odgovarajućih metodoloških pristupa.
Metode provjere znanja sa strukturom ocjene:	Kriterijum vrednovanja rada i ocjenjivanja studenta u toku nastave, vrši se na sljedeći način: Aktivnost (seminarski rad / projektni zadatak): od 0 do 15 bodova; I test / I provjera znanja / I parcijalni ispit: od 0 do 35 bodova. Ukupan broj bodova koji studenta može ostvariti u toku nastave može iznosi maksimalno 50 bodova. Završni / popravni ispit uključuje gradivo koje student nije položio na parcijalnom ispitu što znači da obuhvata drugi dio gradiva (II parcijalni) koji se vrednuje sa 50 bodova ili se sastoji od kompletnog gradiva, tj. I i II parcijalnog ispita. Ukupno vrednovanje svih obaveza studenta u toku semestra, odnosno ocjena na ispitu zasnovana je na ukupnom broju bodova (%) koje je student stekao ispunjavanjem predispitnih obaveza, polaganjem parcijalnog i završnog ispita. Prema kvalitetu stečenih znanja i vještina student može osvojiti maksimalno 100 bodova, a prema sljedećoj skali: Struktura bodovanja Bodovi (%) Seminarski / Projektni zadatak:..... 15 bodova (%) I test / I provjera znanja (I parcijalni ispit):..... 35 bodova (%) Završni ili popravni ispit (II parcijalni ispit):..... 50 bodova (%) Potreban uslov za uspješno okončan ispit je postignut rezultat od 55 bodova pri čemu na svakom dijelu ispita treba ostvariti minimalno 55% (aktivnost, parcijalni ispit, završni ispit), tj. da bi student položio ispit mora ostvariti sljedeće uslove: - Aktivnost (seminarski rad / projektni zadatak): 9 bodova - I test / I provjera znanja / parcijalni ispit: 19 bodova - Završni ili popravni ispit (II parcijalni ispit): 27 bodova Studenti koji su položili parcijalni ispit, na završnom / popravnom ispitu polažu samo drugi dio gradiva (dio koji nije obuhvaćen parcijalnim ispitom). Studenti koji nisu položili parcijalni ispit, u okviru završnog / popravnog ispita polažu kompletno gradivo, pri čemu kriteriji za polaganje ispita ostaje identični. Završni / popravni ispit se organizuje kao pismeni i/ili usmeni. Aktivnost se može pratiti kroz izradu zadaće, seminarskih radova, projektnih zadataka ili polaganje kvizova. Konačan uspjeh studenta nakon svih predviđenih oblika provjere znanja, vrednuje se i ocjenjuje sistemom ocjenjivanja kako slijedi: a) 10 -

	izuzetan uspjeh bez grešaka ili sa neznatnim greškama, nosi 95-100 bodova; b) 9 - iznad prosjeka, sa ponekom greškom, nosi 85-94 bodova; c) 8 - prosječan, sa primjetnim greškama, nosi 75-84 bodova; d) 7 - općenito dobar, ali sa značajnijim nedostacima, nosi 65-74 bodova; e) 6 - zadovoljava minimalne uslove, nosi 55-64 bodova; f) 5 - ne zadovoljava minimalne uslove, manje od 55 bodova. Navedena skala se može korigovati prema Pravilima studiranja na Univerzitetu u Sarajevu (Član 45).
Literatura:	Obavezna: 1. Juraj Padjen, Prometne politikaHrvatske, Masmedia, Zagreb 2003. godina. 2. Piero Soave, „Kratak vodić o Europskoj uniji“, Eurospki parlament, oktobar 2016. godine. 3. Marc Thomas, „Kratak vodić o Europskoj uniji“, Eurospki parlament, septembar 2016. godina. 4. Beata Tuszynska i Frederic Gouarderes, „Kratak vodić o Europskoj uniji“, Eurospki parlament, oktobar 2016. Godine. Dopunska: 1. Direktiva 97/67/EZ EUROPSKOG PARLAMENTA I VIJEĆA OD 15.12.1997. godine, „Službeni list Europskih zajednica“ br. 6/Sv. 9 od 21.01.1998. godine. 2. Direktiva 2002/39/EZ EUROPSKOG PARLAMENTA I VIJEĆA OD 10.06.2002. godine, „Službeni list Europskih zajednica“ br. 6/Sv. 1 od 05.07.2002. godine. 3. Direktiva 2008/6/EZ EUROPSKOG PARLAMENTA I VIJEĆA od 20.02.2008. godine o izmjeni i Direktiva 97/67/EZ u pogledu potpunog postizanja unutarnjeg tržišta poštanskih usluga u Zajednici, „Službeni list Europskih zajednica“ br. 06/Sv. 9 od 27.02.2008. godine. 4. Direktiva 2008-68-EZ EUROPSKOG PARLAMENTA I VIJEĆA od 24.09.2008. godine “Službeni list EU 7/Sv.7” Kopneni prijevoz opsanih tvari. 5. Direktiva 2010/40EU EUROPSKOG PARLAMENTA I VIJEĆA od 07.07.2010. “Službeni list EU 7/Sv.8” Okvir za uvođenje inteligentnih prometnih sustava u cestovnom prometu I za veze sa ostalim vrstama prevoza. 6. DIREKTIVA 2004/54/EZ EUROPSKOG PARLAMENTA I VIJEĆA 7. od 29. travnja 2004. o minimalnim sigurnosnim zahtjevima za tunele u transeuropskoj cestovnoj mreži 8. „DIREKTIVA 2008/96/EZ EUROPSKOG PARLAMENTA I VIJEĆA od 19. studenoga 2008. o upravljanju sigurnošću cestovne infrastrukture 9. DIREKTIVA 2009/33/EZ EUROPSKOG PARLAMENTA I VIJEĆA od 23. travnja 2009. o promicanju čistih i energetski učinkovitih vozila u cestovnom prijevozu 10. DIREKTIVA 1999/62/EZ EUROPSKOG PARLAMENTA I VIJEĆA od 17. lipnja 1999. o naknadama koje se naplaćuju za korištenje određenih infrastruktura za teška teretna vozila 11. DIREKTIVA 2004/52/EZ EUROPSKOG PARLAMENTA I VIJEĆA od 29. travnja 2004. o interoperabilnosti elektroničkih sustava za naplatu cestarine u Zajednici 12. DIREKTIVA (EU) 2019/520 EUROPSKOG PARLAMENTA I VIJEĆA od 19. ožujka 2019. o interoperabilnosti elektroničkih

	sustava za naplatu cestarine i olakőavanju prekogranične razmjene informacija o neplaćanju cestarina u Uniji 13. UREDBA (EZ) br. 1072/2009 EUROPSKOG PARLAMENTA I VIJEĆA od 21. listopada 2009. o zajedničkim pravilima za pristup tržištu međunarodnog cestovnog prijevoza teret 14. UREDBA (EZ) br. 561/2006 EUROPSKOG PARLAMENTA I VIJEĆA od 15. ožujka 2006. o usklađivanju određenog socijalnog zakonodavstva koje se odnosi na cestovni promet i o izmjeni uredbi Vijeća (EEZ) br. 3821/85 i (EZ) br. 2135/98 te o stavljanju izvan snage Uredbe Vijeća (EEZ) br. 3820/85 15. DIREKTIVA 2002/39/EZ EUROPSKOG PARLAMENTA I VIJEĆA od 10. lipnja 2002. o izmjeni Direktive 97/67/EZ u vezi s daljnjim otvaranjem tržišta poštanskih usluga u Zajednice 16. DIREKTIVA 2008/6/EZ EUROPSKOG PARLAMENTA I VIJEĆA od 20. veljače 2008. o izmjeni Direktive 97/67/EZ u pogledu potpunog postizanja unutarnjeg tržišta poštanskih usluga u Zajednici. 17. UREDBA (EU) br. 952/2013 EUROPSKOG PARLAMENTA I VIJEĆA od 9. listopada 2013. o Carinskom zakoniku Unije. 18. UREDBA (EU) 2018/644 EUROPSKOG PARLAMENTA I VIJEĆA od 18. travnja 2018. o uslugama prekogranične dostave paketa 19. DIREKTIVA (EU) 2019/789 EUROPSKOG PARLAMENTA I VIJEĆA od 17. travnja 2019. o utvrđivanju pravila o ostvarivanju autorskog prava i srodnih prava koja se primjenjuju na određene internetske prijenose organizacija za radiodifuziju i reemitiranja televizijskih i radijskih programa te o izmjeni Direktive Vijeća 93/83/EEZ 20. UREDBA (EU) 2015/2120 EUROPSKOG PARLAMENTA I VIJEĆA od 25. studenoga 2015. o utvrđivanju mjera u vezi s pristupom otvorenom internetu te o izmjeni Direktive 2002/22/EZ o univerzalnoj usluzi i pravima korisnika u vezi s elektroničkim komunikacijskim mrežama i uslugama i Uredbe (EU) br. 531/2012 o roamingu u javnim pokretnim komunikacijskim mrežama u Uniji. 21. UREDBA (EU) 2018/1971 EUROPSKOG PARLAMENTA I VIJEĆA od 11. prosinca 2018. o osnivanju Tijela europskih regulatora za elektroničke komunikacije (BEREC) i Agencije za potporu BEREC-u (Ured BEREC-a), izmjeni Uredbe (EU) 2015/2120 i stavljanju izvan snage Uredbe (EZ) br. 1211/2009 22. UREDBA (EU) 2019/1150 EUROPSKOG PARLAMENTA I VIJEĆA od 20. lipnja 2019. o promicanju pravednosti i transparentnosti za poslovne korisnike usluga internetskog posredovanja 23. UREDBA (EZ) br. 549/2004 EUROPSKOG PARLAMENTA I VIJEĆA od 10. ožujka 2004. o utvrđivanju okvira za stvaranje jedinstvenog europskog neba 24. UREDBA (EZ) br. 550/2004 EUROPSKOG PARLAMENTA I VIJEĆA od 10. ožujka 2004. o pružanju usluga u zračnoj plovidbi u jedinstvenom europskom nebu 25. UREDBA (EZ) br. 552/2004 EUROPSKOG PARLAMENTA I VIJEĆA od 10. ožujka 2004. o interoperabilnosti Europske mreže za upravljanje zračnim prometom 26. UREDBA (EU) 2019/712 EUROPSKOG PARLAMENTA I VIJEĆA od 17. travnja 2019. o zaštiti tržišnog natjecanja u zračnom prijevozu i stavljanju izvan snage Uredbe (EZ) br. 868/2004

	27. DIREKTIVA 2012/34/EU EUROPSKOG PARLAMENTA I VIJEĆA od 21. studenoga 2012. o uspostavi jedinstvenog Europskog željezničkog proctora 28. DIREKTIVA (EU) 2016/797 EUROPSKOG PARLAMENTA I VIJEĆA od 11. svibnja 2016. o interoperabilnosti željezničkog sustava u Europskoj uniji 29. DIREKTIVA (EU) 2016/798 EUROPSKOG PARLAMENTA I VIJEĆA od 11. svibnja 2016. o sigurnosti željeznica, 30. UREDBA (EU) 2016/796 EUROPSKOG PARLAMENTA I VIJEĆA od 11. svibnja 2016. o Agenciji Europske unije za željeznice I stavljanju izvan snage Uredbe (EZ) br. 881/2004 31. UREDBA (EZ) br. 1371/2007 EUROPSKOG PARLAMENTA I VIJEĆA 32. od 23. listopada 2007. o pravima i obvezama putnika u željezničkom prometu 33. Bilješke i slajdovi s predavanja (mogu se preuzeti sa službene internet stranice Fakulteta za saobraćaj i komunikacije i elektronska distribucija svakom pojedinačnom studentu)

Šifra predmeta: **13-14-15-6TRTES020203**	**Naziv predmeta:** **GEOINFORMACIJSKI SISTEMI**		
Ciklus: II	**Godina: I**	**Semestar: I**	**Broj ECTS kredita: 6**
Status: Izborni predmet		**Ukupan broj sati: 90** Predavanja: 45 Vježbe: 30 Seminari i projektni zadaci: 15	
Učesnici u nastavi	**Nastavnici i saradnici izabrani na oblast kojoj predmet pripada/predmet**		
Preduslov za upis:	NE		
Cilj (ciljevi) predmeta:	Upoznavanje studenata sa osnovnim konceptima GIS sistema, načinom rada ovih sistema, planiranjem, implementacijom i mogućim primjenama.		
Tematske jedinice: *(po potrebi plan izvođenja po sedmicama se utvrđuje uvažavajući specifičnosti organizacionih jedinica)*	1. Pojam geoinformacijskih sistema (GIS) 2. Komponente GIS-a 3. Proces prikupljanja i manipulacije GIS podacima 4. Struktura i modeli prostornih podataka 5. Upravljanje bazom podataka 6. Koordinatni sistemi, projekcije, georeferenciranje 7. Baze geografskih podataka 8. Standardizacija u GIS-u 9. Izlazni podaci i kartografija 10. Tehnike grafičkog prikaza 11. Principi slojevitog prikaza prostornih podataka 12. Oblasti primjene i osnovne GIS funkcije 13. Web i mobilni GIS 14. Primjena GIS-a u planiranju telekomunikacijske infrastrukture 15. Primjena GIS-a u planiranju saobraćajne infrastrukture		
Ishodi učenja:	Znanje: Studenti će biti upoznati sa osnovnim konceptima razvoja i standardizacijom u oblasti GIS-a, principima web i mobilnih GIS sistema kao i konkretnoj primjeni sa posebnim fokusom na oblast saobraćaja i komunikacija. Studenti će se upoznati sa procesom razvoja GIS sistema, od trenutka javljanja ideje i potrebe za GIS-om,		

	prikupljanja podataka i formiranja GIS baze podataka, georeferenciranja, grafičkog prikaza i korištenja GIS sistema. Vještine: Studenti će savladati određene softverske alate potrebne za projektovanje i razvoj GIS sistema. Kompetencije: Nakon položenog ispita student će biti u mogućnosti planirati, projektovati i razvijati GIS sisteme i izvršiti odabir odgovarajućih tehnologija za razvoj specifičnih rješenja.
Cilj održivog razvoja (SDG):	SDG9 – Industrija, inovacije i infrastruktura SDG11 – Održivi gradovi i zajednice
Metode izvođenja nastave:	Nastava se realizira kroz izvođenje predavanja, vježbi i praktičnog dijela nastave koji uključuje laboratorijske vježbe. Predavanja se realizuju kroz usmeno izlaganje sa prezentacijom i prikazom primjera iz prakse. Vježbe i laboratorijske vježbe održavaju se uz upotrebu softverskih alata za rješavanje konkretnih problemskih i praktičnih zadataka. Studenti će biti obavezni izraditi i prezentirati seminarske radove i/ili projektne zadatake. U toku nastave se koriste različite metode koje uključuju: usmeno izlaganje, razgovori diskusije, demonstracije, individualni i grupni rad, itd.
Metode provjere znanja sa strukturom ocjene:	Ukupan broj bodova koji student može ostvariti u toku nastave je 50 i na završnom ispitu 50. Bodovi u toku nastave su raspoređeni na zadaće i aktivnost i/ili seminar i/ili projektni zadatak i na parcijalni ispit. Završni/popravni ispit uključuje gradivo koje student nije položio na parcijalnom ispitu što znači da obuhvata drugi dio gradiva koji se vrednuje sa 50 bodova za studente koji su položili parcijalni ispit. Studenti koji nisu položili gradivo sa parcijalnog ispita polažu gradivo sa parcijalnog i završnog ispita. Završni / popravni ispit se organizuje kao pismeni i/ili usmeni ispit uz polaganje praktičnog dijela. Ukupno vrednovanje svih obaveza studenta u toku semestra, odnosno ocjena na ispitu, zasnovana je na ukupnom broju bodova koje je student stekao ispunjavanjem predispitnih obaveza, polaganjem parcijalnog i završnog ispita. Prema kvalitetu stečenih znanja i vještina student može osvojiti maksimalno 100 bodova, a prema sljedećoj skali: Struktura bodovanja Bodovi (%) Seminar / Aktivnost na nastavi / Projektni zadatak:..... 20 bodova (%) I test / I provjera znanja (I parcijalni ispit):..... 30 bodova (%) Završni ili popravni ispit (II parcijalni ispit):..... 50 bodova (%) Potreban uslov za polaganje ispita je 55 bodova u sumi uz ostvarenih najmanje 55% bodova na provjerama znanja (parcijalni ispit i završni/popravni ispit). Konačan uspjeh studenta, nakon svih predviđenih oblika provjere znanja, vrednuje se i ocjenjuje sistemom kako slijedi: a) 10 - izuzetan uspjeh bez grešaka ili sa neznatnim greškama (95-100 bodova); b) 9 - iznad prosjeka, sa ponekom greškom (85-94 bodova); c) 8 - prosječan, sa primjetnim greškama (75-84 bodova); d) 7 - općenito dobar, ali sa značajnijim nedostacima (65-74 bodova); e) 6 - zadovoljava minimalne uslove (55-64 bodova); f) 5 - ne zadovoljava minimalne uslove (manje od 55 bodova).
Literatura:	Obavezna: 1. Nastavni materijal dostupan na Intranet portalu Fakulteta za saobraćaj i komunikacije. Dopunska: 1. Kang Tsung Chang, „*Introduction to Geographic Information Systems*“, McGraw-Hill Education, 2019.

	2. Paul Bolstad, „*GIS Fundamentals A First Text on Geographic Information Systems,*“ Eider Press, 2016. 3. Ian Heywood, Sarah Cornelius, „*An introduction to geographical information systems*“, Pearson Education Limited, 2006. 4. Kurt Menke, Richard Smith Jr., Luigi Pirelli, John Van Hoesen, „*Mastering QGIS*“,“ Packt Publishing Ltd., 2016. 5. Gábor Farkas, „Practical GIS,“ Packt Publishing Ltd., 2017. 6. Anita Graser, „*Learning QGIS*,“ Packt Publishing Ltd., 2016. 7. Ralph M. Stair, George W. Reynolds, „*Fundamentals of Information Systems*,“ Cengage Learning, 2016. 8. Alan Dennis, Barbara Haley Wixom, Roberta M. Roth, „*Systems analysis and design*,“ Wiley, 2015. 9. Patricia Wallace, „*Introduction to Information Systems*,“ Pearson Education, 2015. 10. Arthur M. Langer, „*Analysis and Design of Information Systems, Springer-Verlag*,“ 2008. 11. John Wang, „*Innovations in Supply Chain Management for Information Systems*,“ Business Science Reference, 2010. 12. Christos Kalloniatis: “*Modern Information Systems*,“ InTech Croatia, 2012.

Šifra predmeta: **13-14-15-7TRTES020203**	**Naziv predmeta:** **SOFTVERSKI ALATI ZA SIMULACIJU I ANALIZU CESTOVNOG SAOBRAĆAJA**		
Ciklus: II	**Godina: II**	**Semestar: III**	**Broj ECTS kredita:** 6
Status: Izborni predmet		**Ukupan broj sati: 90** Razraditi distribuciju sati po tipu: Predavanja: 30, Vježbe: 20, Seminar: 10, Laboratorijske vježbe: 10, Praksa: 10, Terenski rad: 10.	
Učesnici u nastavi	Nastavnici i saradnici izabrani na oblast kojoj predmet pripada/predmet		
Preduslov za upis:	NE		
Cilj (ciljevi) predmeta:	Sticanje znanja i razvijanje vještina kroz praktičnu upotrebu softverskih alata dizajniranih za istraživanje, analizu, simulaciju, izradu projektnih rješenja i upravljanje procesima u cestovnom saobraćaju.		
Tematske jedinice: *(po potrebi plan izvođenja po sedmicama se utvrđuje uvažavajući specifičnosti organizacionih jedinica)*	1. Proces istraživanja i analiza u cestovnom saobraćaju u funkciji izrade adekvatnih projektnih zadataka i rješenja; 2. Značaj i mogućnosti primjene softverskih alata u cestovnom saobraćaju 3. Projektna dokumentacija, planovi, projekti i projektna rješenja; 4. Primjena softverskih alata u procesu planiranja u cestovnom saobraćaju; 5. Primjena softverskih alata u procesu projektovanja u cestovnom saobraćaju; 6. Primjena softverskih alata u procesu organizacije u cestovnom saobraćaju; 7. Primjena softverskih alata u procesu upravljanja u cestovnom saobraćaju; 8. Primjena softverskih alata u oblasti sigurnosti cestovnog saobraćaja; 9. Primjena softverskih alata u oblasti uticaja cestovnog saobraćaja na okoliš;		

	10. Primjena softverskih alata u oblasti projektovanja saobraćajne signalizacije; 11. Primjena softverskih alata u oblasti edukacije u cestovnom saobraćaju; 12. Primjena softverskih alata u oblasti analize saobraćajnih nezgoda; 13. Primjena softverskih alata u istraživanju performansi vozila; 14. Primjena softverskih alata u istraživanju karakteristika vozača; 15. Primjena softverskih alata u istraživanju karakteristika ceste.
Ishodi učenja:	Znanje: Praktična primjena softverskih alata dizajniranih za istraživanje, analizu, simulaciju, izradu projektnih rješenja i upravljanje procesima u cestovnom saobraćaju. Vještine: Sposobnost primjene praktičnih znanja neophodnih za adekvatnu softverskih alata dizajniranih za istraživanje, analizu, simulaciju, izradu projektnih rješenja i upravljanje procesima u cestovnom saobraćaju. Kompetencije: Sposobnosti samostalnog razumijevanja i korištenja propisa, korištenja stručne literature, primjene metoda i postupaka, mjerenja i istraživanja, izrada analiza, procjena i praktičnih rješenja, preventivnog djelovanja, te postupaka neophodnih za primjenu softverskih alata dizajniranih za istraživanje, analizu, simulaciju, izradu projektnih rješenja i upravljanje procesima u cestovnom saobraćaju
Cilj održivog razvoja (SDG):	COR4 – Kvalitetno obrazovanje - Osigurati uključivo i kvalitetno obrazovanje, te promovirati mogućnosti cjeloživotnog učenja svih ljudi, svih životnih dobi COR5-Rodna ravnopravnost - Postići rodnu ravnopravnost i osnažiti sve žene i djevojčice. COR8-Dostojanstven rad i ekonomski rast - Promovirati uključiv i održiv ekonomski rast, zaposlenost i dostojanstven rad za sve. COR9- Industrija, Inovacije i Infrastruktura-Izgraditi izdržljivu infrastrukturu, promovirati uključivu i održivu industrijalizaciju i poticati inovativnost. COR11 – Održivi gradovi i lokalne zajednice - Učiniti gradove i naselja uključivim, sigurnim, prilagodljivim i održivim. COR12-Održiva potrošnja i proizvodnja-Osigurati održive oblike potrošnje i proizvodnje. COR13-Zaštita klime - Poduzeti hitne akcije u borbi protiv klimatskih promjena i njihovih posljedica COR17- Partnerstvom do ciljeva-Uvrstiti globalno partnerstvo za održivi razvoj
Metode izvođenja nastave:	Usmeno iznošenje sa prezentacijom i prikazom različitih softverskih alata dizajniranih za istraživanje, analizu, simulaciju, izradu projektnih rješenja i upravljanje procesima u cestovnom saobraćaju uz korištenje, softvera, mjerne opreme, te samostalni rad i izlaganje pojedinih konkretnih istraživanja. Iniciranje rasprava i diskusija o problemima iz prakse, pojedinačnih zapažanja iz različitih okruženja, izrada samostalnih analiza dizajniranih za istraživanje, analizu, simulaciju, izradu projektnih rješenja i upravljanje procesima u cestovnom saobraćaju
Metode provjere znanja sa strukturom ocjene:	Ocjena kreativnosti na nastavi i vježbama uz izradu samostalnih radova, ocjena parcijalnog testa u toku nastave kao i ocjena završnog ispita. Kriterijum praćenja rada i ocjenjivanja studenta u toku nastave i to prema sljedećem načinu: – Seminar 15 bodova (%), položeno ako se osvoji preko 50 %. – I Parcijalni ispit/test/provjera znanja/35 bodova (%), položen je ako se osvoji preko 50 %. – Završni ispit (II Parcijalni) 50 bodova (%), položeno ako se osvoji preko 50 %.

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– Završni ispit (Integralni) 85 bodova (%), položeno ako se osvoji preko 50 %.
Ukupan broj bodova (%) koji student prema navedenom praćenju u toku nastave može ostvariti iznosi maksimalno 50 bodova (%), što sa Završnim (II parcijalnim) čini 100 bodova (%). Za studente koji nisu položili I Parcijalni ispit, Završni ispit (Integralni) se organizuje iz cjelokupnog pređenog gradiva u toku nastave i vježbi, i vrednuje se sa 85 bodova (%), što sa seminarskim radom/praktičnim radom čini 100 bodova (%). Konačan uspjeh studenta nakon svih predviđenih oblika provjere znanja, vrednuje se i ocjenjuje sistemom ocjenjivanja kako slijedi: a) 10 (A) - izuzetan uspjeh bez grešaka ili sa neznatnim greškama, nosi 95-100 bodova; b) 9 (B) - iznad prosjeka, sa ponekom greškom, nosi 85-94 bodova; c) 8 (C) - prosječan, sa primjetnim greškama, nosi 75-84 bodova; d) 7 (D) - općenito dobar, ali sa značajnijim nedostacima, nosi 65-74 bodova; e) 6 (E) - zadovoljava minimalne uslove, nosi 55-64 bodova; f) 5 (F, FX) - ne zadovoljava minimalne uslove, manje od 55 bodova.
Ukupno vrednovanje svih obaveza studenta u toku semestra, odnosno ocjena na ispitu zasnovana je na ukupnom broju bodova (%) koje je student stekao ispunjavanjem predispitnih obaveza i polaganjem parcijalnog i završnog ispita, a prema kvalitetu stečenih znanja i vještina, i sadrži maksimalno 100 bodova, te se utvrđuje prema sljedećoj skali:
<table>
<tr><td>Obaveze studenta</td><td>Bodovi (%</td></tr>
<tr><td>Prisutnost na predavanjima i vježbama. (obavezno je prisustvu svim oblicima nastave min. 80 % i ovo je uslov za ovjeru/potpis urednog pohađanja)</td><td>0 bodova</td></tr>
<tr><td>Seminar</td><td>15 bodova</td></tr>
<tr><td>I Parcijalni ispit/Test/Provjera znanja/</td><td>35 bodova</td></tr>
<tr><td>Završni ispit (II Parcijalni)</td><td>50 bodova</td></tr>
<tr><td>Završni ispit (Integralni)</td><td>85 bodova</td></tr>
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</tr>
<tr>
<td>Literatura:</td>
<td>
Obavezna

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Šifra predmeta: **13-14-15-8TRTES020203**	**Naziv predmeta:** **ICT U CESTOVNOM SAOBRAĆAJU**		
Ciklus: II	**Godina: II**	**Semestar: I**	**Broj ECTS kredita: 6**
Status: Obavezan predmet		**Ukupan broj kontakt sati: 90** Opciono razraditi distribuciju sati po tipu: Predavanja 45 Vježbe 30 Seminar 15	
Učesnici u nastavi	**Nastavnici i saradnici izabrani na oblast kojoj predmet pripada/predmet**		
Preduslov za upis:	nema		
Cilj (ciljevi) predmeta:	Cilj ovog predmeta je dati pregled primjene informacijskih i komunikacijskih tehnologija (ICT) u cestovnom saobraćaju.		
Tematske jedinice: *(po potrebi plan izvođenja po sedmicama se utvrđuje uvažavajući specifičnosti organizacionih jedinica)*	1. Pojam i značaj prometnog i komunikacijskog sustava 2. Osnovne karakteristike transportnog supstrata 3. Transportni uređaji 4. Manipulacijska sredstva i transportna oprema 5. Čovjek kao komponenta prometnog i transportnog sustava 6. Osnovni koncept i funkcije modova transporta 7. Kapacitet i razina usluge transportnog sustava 8. Osnovne karakteristike i izazovi mobilnosti		

	9. Mod cestovnog transporta 10. Mod željezničkog transporta 11. Mod zrakoplovnog transporta 12. Mod vodnog transporta 13. Mod cjevovodnog transporta 14. Poštanske i komunikacijske tehnologije 15. Informacijsko komunikacijske tehnologije u transportu
Ishodi učenja:	Znanje: Predmet Informacijsko komunikacijske tehnologije u cestovnom saobraćaju treba osigurati potreban nivo znanja upotrebe informacijskih i komunikacijskih tehnologija u procesu upravljanja podacima, učenje o načinima primjene baza podataka i modernih komunikacijskih tehnologija za podršku transportnih procesa. Vještine: Predmet Informacijsko komunikacijske tehnologije u cestovnom saobraćaju omogućava stjecanje vještina neophodnih za planiranje, dizajniranje i upravljanje informacijsko komunikacijskim tehnologijama u cestovnom prometu. Kompetencije: Studenti kroz nastavni proces predavanja, vježbe, i seminarski rad trebaju steći odgovarajuće kompetencije za analizu funkcija informacijsko komunikacijskog sustava u cestovnom saobraćaju i način kreiranja usluga informiranja putnika i vozača u cestovnom saobraćaju.
Cilj održivog razvoja (SDG):	"SDG3 – Zdravlje i blagostanje"; "SDG 9 Industrija, inovacije i infrastruktura ", „SDG11- Održivi gradovi i zajednce", SDG 13-Zaštita klime"
Metode izvođenja nastave:	Predavanja, vježbe i seminarski rad.
Metode provjere znanja sa strukturom ocjene:	1. Prisustvo na na nastavi i semiraski rad 15 bodova 2. Prva provjera znanja 35 bodova 3. Završna provjera znanja 50 bodova
Literatura:	Obavezna: 1. Nastavni materijal dostupan na online platformi za učenje Fakulteta za saobraćaj i komunikacije Dopunska: 1. Ruimin Li and Zhengbing He: Traffic Information and Control, IET TRANSPORTATION, London, 2021. 2. Marco Picone ; Stefano Busanelli: Advanced Technologies for Intelligent Transportation Systems, Springer, London, 2015.

Šifra predmeta: 13-14-15-9TRTES020203	**Naziv predmeta: INSPEKCIJA CESTA (RSI) I REVIZIJA CESTA (RSA)**		
Ciklus: II	**Godina: II**	**Semestar: III**	**Broj ECTS kredita:** 6
Status: Izborni predmet		**Ukupan broj sati: 90** Razraditi distribuciju sati po tipu: Predavanja: 30, Vježbe: 20, Seminar: 10, Laboratorijske vježbe: 10, Praksa: 10, Terenski rad: 10.	
Učesnici u nastavi	**Nastavnici i saradnici izabrani na oblast kojoj predmet pripada/predmet**		
Preduslov za upis:	NE		

Cilj (ciljevi) predmeta:	Sticanje znanja o osnovama procesa, procedurama i tehnikama za implementaciju inspekcije sigurnosti cesta (RSI) i revizije sigurnosti cesta (RSA).
Tematske jedinice: *(po potrebi plan izvođenja po sedmicama se utvrđuje uvažavajući specifičnosti organizacionih jedinica)*	1. Osnove procesa inspekcije cesta (RSA) i revizije cesta (RSI) 2. Pravni aspekti i institucionalno-upravljački aspekti u procesu inspekcije cesta (RSA) i revizije cesta (RSI) 3. Baze podataka i istraživanje saobraćajnih nezgoda 4. Osnovni parametri sigurnosti cesta 5. Osnovni principi projektovanja cesta (funkcija ceste, poprečni profil, trasa) 6. Osnovni principi projektovanja cesta (raskrsnice, javni i privatni sadržaji uz cestu) 7. Osnovni principi projektovanja cesta (ranjivi korisnici ceste, saobraćajna signalizacija, rasvjeta) 8. Osnovni principi projektovanja cesta (karakteristike pojasa uz cestu, elementi pasivne zaštite korisnika ceste) 9. Kontrolne liste za inspekciju cesta (RSI) i 10. Kontrolne liste za reviziju cesta (RSI) 11. Priprema i implementacija terenskih obilazaka ceste 12. Izrada izvještaja o inspekciji cesta (RSI) 13. Izrada izvještaja o reviziji cesta (RSA) 14. Prezentacija i odbrana izvještaja 15. Analiza primjera iz prakse
Ishodi učenja:	Znanje: Teorijska odgovarajuća znanja i iskustva za praktičnu primjenu u oblasti procesa inspekcije sigurnosti cesta (RSI) i revizije sigurnosti cesta (RSA), pravnim aspektima, ključnim fazama i načinima implementacije, ulogama i odgovornostima ključnih subjekata u procesu, te procedurama i tehnikama za implementaciju procesa inspekcije sigurnosti cesta (RSA) i revizije sigurnosti cesta (RSI). Vještine: Sposobnost primjene teorijskih i praktičnih znanja neophodnih za adekvatnu analizu procesa inspekcije sigurnosti cesta (RSI) i revizije sigurnosti cesta (RSA), pravnim aspektima, ključnim fazama i načinima implementacije, ulogama i odgovornostima ključnih subjekata u procesu, te procedurama i tehnikama za implementaciju procesa inspekcije sigurnosti cesta (RSA) i revizije sigurnosti cesta (RSI). Kompetencije: Sposobnosti samostalnog razumijevanja i korištenja propisa, korištenja stručne literature, primjene metoda i postupaka, mjerenja i istraživanja, izrada analiza, procjena i praktičnih rješenja, preventivnog djelovanja, te postupaka neophodnih za adekvatnu analizu procesa inspekcije sigurnosti cesta (RSI) i revizije sigurnosti cesta (RSA).
Cilj održivog razvoja (SDG):	COR4 – Kvalitetno obrazovanje - Osigurati uključivo i kvalitetno obrazovanje, te promovirati mogućnosti cjeloživotnog učenja svih ljudi, svih životnih dobi COR5-Rodna ravnopravnost - Postići rodnu ravnopravnost i osnažiti sve žene i djevojčice. COR8-Dostojanstven rad i ekonomski rast - Promovirati uključiv i održiv ekonomski rast, zaposlenost i dostojanstven rad za sve. COR9- Industrija, Inovacije i Infrastruktura-Izgraditi izdržljivu infrastrukturu, promovirati uključivu i održivu industrijalizaciju i poticati inovativnost. COR11 – Održivi gradovi i lokalne zajednice - Učiniti gradove i naselja uključivim, sigurnim, prilagodljivim i održivim. COR12-Održiva potrošnja i proizvodnja-Osigurati održive oblike potrošnje i proizvodnje.

<table>
<tr><td></td><td>COR13-Zaštita klime - Poduzeti hitne akcije u borbi protiv klimatskih promjena i njihovih posljedica
COR17- Partnerstvom do ciljeva-Uvrstiti globalno partnerstvo za održivi razvoj</td></tr>
<tr><td>Metode izvođenja nastave:</td><td>Usmeno iznošenje sa prezentacijom i prikazom različitih analiza, studija, modela i metoda u oblasti procesa inspekcije sigurnosti cesta (RSI) i revizije sigurnosti cesta (RSA), uz korištenje video i audio zapisa, softvera, mjerne opreme, te samostalno izlaganje pojedinih konkretnih istraživanja. Iniciranje rasprava i diskusija o problemima iz prakse, pojedinačnih zapažanja iz različitih okruženja, izrada samostalnih analiza, istraživanja, mjerenja i modeliranja u oblasti procesa inspekcije sigurnosti cesta (RSI) i revizije sigurnosti cesta (RSA).</td></tr>
<tr><td>Metode provjere znanja sa strukturom ocjene:</td><td>Ocjena kreativnosti na nastavi i vježbama uz izradu samostalnih radova, ocjena parcijalnog testa u toku nastave kao i ocjena završnog ispita. Kriterijum praćenja rada i ocjenjivanja studenta u toku nastave i to prema sljedećem načinu:
– Seminar 15 bodova (%), položeno ako se osvoji preko 50 %.
– I Parcijalni ispit/test/provjera znanja/35 bodova (%), položen je ako se osvoji preko 50 %.
– Završni ispit (II Parcijalni) 50 bodova (%), položeno ako se osvoji preko 50 %.
– Završni ispit (Integralni) 85 bodova (%), položeno ako se osvoji preko 50 %.
Ukupan broj bodova (%) koji student prema navedenom praćenju u toku nastave može ostvariti iznosi maksimalno 50 bodova (%), što sa Završnim (II parcijalnim) čini 100 bodova (%). Za studente koji nisu položili I Parcijalni ispit, Završni ispit (Integralni) se organizuje iz cjelokupnog pređenog gradiva u toku nastave i vježbi, i vrednuje se sa 85 bodova (%), što sa seminarskim radom/praktičnim radom čini 100 bodova (%). Konačan uspjeh studenta nakon svih predviđenih oblika provjere znanja, vrednuje se i ocjenjuje sistemom ocjenjivanja kako slijedi: a) 10 (A) - izuzetan uspjeh bez grešaka ili sa neznatnim greškama, nosi 95-100 bodova; b) 9 (B) - iznad prosjeka, sa ponekom greškom, nosi 85-94 bodova; c) 8 (C) - prosječan, sa primjetnim greškama, nosi 75-84 bodova; d) 7 (D) - općenito dobar, ali sa značajnijim nedostacima, nosi 65-74 bodova; e) 6 (E) - zadovoljava minimalne uslove, nosi 55-64 bodova; f) 5 (F, FX) - ne zadovoljava minimalne uslove, manje od 55 bodova.
Ukupno vrednovanje svih obaveza studenta u toku semestra, odnosno ocjena na ispitu zasnovana je na ukupnom broju bodova (%) koje je student stekao ispunjavanjem predispitnih obaveza i polaganjem parcijalnog i završnog ispita, a prema kvalitetu stečenih znanja i vještina, i sadrži maksimalno 100 bodova, te se utvrđuje prema sljedećoj skali:
<table>
<tr><td>Obaveze studenta</td><td>Bodovi (%)</td></tr>
<tr><td>Prisutnost na predavanjima i vježbama. (obavezno je prisustvu svim oblicima nastave min. 80 % i ovo je uslov za ovjeru/potpis urednog pohađanja)</td><td>0 bodova</td></tr>
<tr><td>Seminar</td><td>15 bodova (%)</td></tr>
<tr><td>I Parcijalni ispit/Test/Provjera znanja/</td><td>35 bodova (%)</td></tr>
<tr><td>Završni ispit (II Parcijalni)</td><td>50 bodova (%)</td></tr>
<tr><td>Završni ispit (Integralni)</td><td>85 bodova (%)</td></tr>
</table></td></tr>
<tr><td>Literatura:</td><td>Obavezna
1. O. Lindov, et al, Priručnik za cestovnu sigurnost, Udruženje inženjera saobraćaja i komunikacija u Bosni i Hercegovini, Sarajevo, 2018
2. Proposal for a Directive of the European Parliament and of the Council</td></tr>
</table>

	amending Directive 2008/96/EC on road infrastructure safety management, The European Parliament and the Council of the European Union, 2019 3. Road Safety Inspection Manual, Common problems – Shared solutions, South East Europe Transport Observatory (SEETO) & World Bank, 2016 4. Directive 2008/96/EC of the European Parliament and of the Council on Road Infrastructure Safety Management, The European Parliament and the Council of the European Union, 2008 5. O. Lindov, et al, Stručni i pravni dio projektovanja, Udruženje inženjera saobraćaja i komunikacija u Bosni i Hercegovini, Sarajevo, 2013 6. D. Jovanov, et al, Practical Guide for Road Safety Auditors and Inspectors, Automobile and Motorcycle Association of Serbia - Center for Motor Vehicles, Belgrade, 2018. 7. Road Safety Manual, PIARC - World Road Association, https://www.piarc.org/en/ 8. Lindov, O., Sigurnost u cestovnom saobraćaju, Fakultet za saobraćaj i komunikacije Sarajevo, 2007. Dopunska: 1. Road safety engineering -the essentials, An outline of the road safety engineering profession and what it can achieve for CAREC roads, Phillip Jordan, ADB CAREC Road Safety Engineer 2. ISO 9000:2005, Quality management systems — Fundamentals and vocabulary 3. ISO 9001:2008, Quality management systems — Requirements 4. ISO 14001:2004, Environmental management systems — Requirements with guidance for use 5. ISO 14004:2004, Environmental management systems — General guidelines on principles, systems and support techniques 6. ISO 19011:2011, Guidelines for auditing management systems 7. ISO/TS 16949, Quality management systems — Particular requirements for the application of ISO 9001:2008 for automotive production and relevant service part organizations 8. ISO 31000:2009, Risk Management — Principles and guidelines 9. OHSAS 18001:2007, Occupational health and safety management systems — Requirements 10. World Report on Road Traffic Injury Prevention by M. Peden, R. Scurfield, D. Sleet, D. Mohan, A.A. Hyder, E. Jarawan and C. Mathers Geneva, World Health Organization, 2004. Available at: www.who.int/violence_injury_prevention/publications/road_traffic/world_report/en/ 11. Global status report on road safety: time for action. Geneva, World Health Organization, 2009. Available at: WHO | Global status report on road safety 2009 12. Towards Zero: Ambitious Road Safety Targets and the Safe System Approach. Paris, OECD and International Traffic Forum. 2008 13. Implementing the Recommendations of the World Report on Road Traffic Injury Prevention Country Guidelines for the Conduct of Road Safety Management Capacity Reviews and the Specification of Lead Agency Reforms, Investment Strategies and Safe System Projects. Tony Bliss, Jeanne Breen World Bank Global Road Safety Facility, Washington DC. 2009.

Šifra predmeta: 13-14-15-10TRTES020203	Naziv predmeta: ODRŽIVA URBANA MOBILNOST		
Ciklus: II	**Godina: II**	**Semestar: III**	**Broj ECTS kredita: 6**
Status: Izborni predmet		**Ukupan broj sati: 3+2+1** Opciono razraditi distribuciju sati po tipu: Predavanja:3 Vježbe:2 Laboratorijske vježbe:1	

Učesnici u nastavi	**Nastavnici i saradnici izabrani na oblast kojoj predmet pripada/**
Preduslov za upis:	NE
Cilj (ciljevi) predmeta:	Sticanje znanja i vještina izrade planova održive urbane mobilnosti, uključujući sve segmente planiranja, projektovanja, implementacije i evaluacije i praćenja održivog razvoja u urbanim sredinama.
Tematske jedinice: *(po potrebi plan izvođenja po sedmicama se utvrđuje uvažavajući specifičnosti organizacionih jedinica)*	1. Pojam održive urbane mobilnosti 2. Strategijsko planiranje održive urbane mobilnosti 3. Indikatori održive urbane mobilnosti 4. Planovi održive urbane mobilnosti SUMP 5. Koraci razvoja SUMP-a 6. Dizajn infrastrukture u funkciji održive urbane mobilnosti. 7. E mobility infrastruktura 8. Koncept Carpooling-a i Ridesharing-a u funkciji održive urbane mobilnosti 9. Pametni gradovi, digitalizacija i mobilnost 10. Održiva logistika u urbanim područjima 11. Kvalitet zraka i buke i održiva urbana mobilnost 12. Smart mobility i održiva urbana mobilnost 13. Energetska efikasnost i održiva urbana mobilnost 14. Standardi i politike EU u oblasti održive urbane mobilnosti 15. Procjena i metode mjerenja učinkovitosti mjera održive urbane mobilnosti
Ishodi učenja:	– Sticanje vještina i saznanja na razvijanju sposobnosti, razumijevanja i praktične primjene inovativnih načina planiranja urbane mobilnosti – Sticanje znanja o planiranju i projektovanje prostora sa pristupačnošću i dostupnošću odredišta i usluga, – Sticanje znanja o povećanju sigurnosti i zaštite u kretanju i mobilnosti, smanjenje emisija stakleničkih plinova – Sticanje znanja o smanjenju potrošnje fosilnih goriva, atraktivnost gradskih prostora, povećanje kvalitete života, zdraviji okoliš i smanjeni štetni utjecaj na zdravlje građana. – Sticanje znanje i vještina u razvoju i planiranju prostora i mobilnosti za osobe sa umanjenom pokretljivošću.
Cilj održivog razvoja (SDG):	COR4 – Kvalitetno obrazovanje - Osigurati uključivo i kvalitetno obrazovanje, te promovirati mogućnosti cjeloživotnog učenja svih ljudi, svih životnih dobi COR5-Rodna ravnopravnost - Postići rodnu ravnopravnost i osnažiti sve žene i djevojčice. COR8-Dostojanstven rad i ekonomski rast - Promovirati uključiv i održiv ekonomski rast, zaposlenost i dostojanstven rad za sve. COR9- Industrija, Inovacije i Infrastruktura-Izgraditi izdržljivu infrastrukturu, promovirati uključivu i održivu industrijalizaciju i poticati inovativnost.

<table>
<tr><td></td><td>COR11 – Održivi gradovi i lokalne zajednice - Učiniti gradove i naselja uključivim, sigurnim, prilagodljivim i održivim.
COR12-Održiva potrošnja i proizvodnja-Osigurati održive oblike potrošnje i proizvodnje.
COR13-Zaštita klime - Poduzeti hitne akcije u borbi protiv klimatskih promjena i njihovih posljedica
COR17- Partnerstvom do ciljeva-Uvrstiti globalno partnerstvo za održivi razvoj</td></tr>
<tr><td>Metode izvođenja nastave:</td><td>Predavanja popraćena multimedijalnim prezentacijama
Auditorne vježbe sa analizom konkretnih primjera iz prakse</td></tr>
<tr><td>Metode provjere znanja sa strukturom ocjene:</td><td>
<table>
<tr><td>Aktivnost u toku predavanja</td><td>-</td><td>Pismeni ispit</td><td>50</td></tr>
<tr><td>Praktična nastava</td><td>-</td><td>Usmeni ispit</td><td>-</td></tr>
<tr><td>Kolokvijumi</td><td>35</td><td></td><td></td></tr>
<tr><td>Seminarski rad</td><td>15</td><td></td><td></td></tr>
<tr><td>Ukupno</td><td></td><td>Ukupno</td><td>100</td></tr>
</table>
</td></tr>
<tr><td>Literatura:</td><td>

1. Dalkmann H., Brannigan C.: Transport and climate change, Modul 5e: Sustainable transport: A sourcebook for policy-makers in developing cities, Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH, Eschborn, Germany. 2007.
2. Gwilliam, K. (ed): Cities on the Move: A World Bank Urban Transport Strategy Review, Strategy Paper, Washington, DC: World Bank, 2001.
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4. Lindov O., Omerhodžić A., Bušić D.: Izazovi implementacije plana održive urbane mobilnosti za područje Sarajeva 2020-2025., Konferencija o urbanom planiranju i regionalnom razvoju, UKI BH, Sarajevo, 2020.
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12. Smjernice za razvoj i provedbu plana održive urbane mobilnosti, European Platform on Sustainable Mobility Pan, 2020,

</td></tr>
</table>

	Croatian_sump_guidelines.pdf 13. Basarić, V.: Model upravljanja raspodelom putovanja na vidove prevoza u funkciji održivog razvoja, Doktorska disertacija, Fakultet tehničkih nauka, Univerzitet u Novom Sadu, 2010. 14. Basarić, V., Djoric V., Jevdjenic A., Jovic J.: Efficient Methodology for Assessment of Targets and Policy Measures for Sustainable Mobility Systems, International Journal of Sustainable Transportation, vol. 9 br. 3, str. 217-226., 2015. 15. Commission of the European Communities, Action Plan on Urban Mobility, Brussels, 30.9.2009. 16. Guidelines Developing and Implementing a Sustainable Urban Mobility Plan, Rupprecht Consult – Forschung und Beratung GmbH, 2011. 17. Kaplanović, S., Mijailović, R.: Internalizacija eksternih troškova u funkciji obezbjeđenja održivog razvoja drumskog saobraćaja, Univerzitet u Beogradu, Ekonomski fakultet, Beograd, 2012. 18. Kaplanović S., Petrović J., Ivković I.: Ekonomski instrumenti u funkciji održivog razvoja drumskog saobraćaja, Istraživanja i projektovanja za privredu, Beograd, godina VII, broj 25, 17-22., 2009. 19. Zietsman J., Rilett L. R.: Sustainable Transportation: Conceptualization and Performance Measures, Report No. SWUTC/02/167403-1, Texas Transportation Institute, The Texas A&M University System College Station, Texas. 2002

Šifra predmeta: **13-14-15-11TRTES020203**	**Naziv predmeta:** **IoT RJEŠENJA ZA INDUSTRIJU ELEKTRIČNIH VOZILA**		
Ciklus: II	**Godina: II**	**Semestar: III**	**Broj ECTS kredita: 6**
Status: Izbornı predmet		**Ukupan broj sati: 3+2+1** Opciono razraditi distribuciju sati po tipu: Predavanja:3 Vježbe:2 Laboratorijske vježbe:1	
Učesnici u nastavi	**Nastavnici i saradnici izabrani na oblast kojoj predmet pripada/predmet**		
Preduslov za upis:	NE		
Cilj (ciljevi) predmeta:	Sticanje znanja o osnovama procesa, tehnologijama, planiranju i upravljanju logističkim operacijama u gradskoj logistici (City Logistics) u cilju ekološki održivog razvoja gradske logistike.		
Tematske jedinice: *(po potrebi plan izvođenja po sedmicama se utvrđuje uvažavajući specifičnosti organizacionih jedinica)*	1. Osnove industrije električnih vozila i uloga IoT tehnologija. 2. Senzori i praćenje performansi električnih vozila putem IoT-a. 3. Daljinsko upravljanje i dijagnostika električnih vozila pomoću IoT-a. 4. Povezivanje vozila s pametnom infrastrukturom za punjenje. 5. IoT rješenja za optimizaciju trajanja baterija u električnim vozilima. 6. Sigurnosni izazovi i rješenja za zaštitu IoT mreža u električnim vozilima. 7. Analiza podataka iz IoT uređaja za unaprjeđenje dizajna električnih vozila. 8. Prednosti i izazovi implementacije autonomne vožnje u električnim vozilima putem IoT-a. 9. Uloga 5G mreža u podršci IoT aplikacijama u električnim vozilima. 10. Praćenje ekoloških učinaka električnih vozila pomoću IoT		

<table>
<tr><td></td><td>tehnologija.
11. Integracija pametnih gradova i električnih vozila putem IoT-a.
12. IoT tehnologije za optimizaciju logistike i upravljanje voznim parkom električnih vozila.
13. Upravljanje potrošnjom energije u električnim vozilima putem IoT senzora.
14. Ekonomski aspekti i poslovni modeli vezani uz IoT rješenja u industriji električnih vozila.
15. Trendovi budućnosti: napredak IoT tehnologija i njihov utjecaj na industriju električnih vozila.</td></tr>
<tr><td>Ishodi učenja:</td><td>– Razumijevanje principa industrije električnih vozila i ključne izazove u njoj.
– Prepoznavanje različite IoT tehnologije i razumjevanje uloge u električnim vozilima.
– Sticanje saznanja o senzorskim tehnogijama za praćenje performansi električnih vozila putem IoT tehnologija.
– Sticanje znanja o analizi podataka dobivenih od senzora za dijagnosticiranje nedostataka i optimizirale performanse električnihvozila.
– Sticanje znanja o načinima povezivanja električnih vozila s pametnom infrastrukturom za punjenje pomoću IoT rješenja.
– Sticanje znanja o principima upravljanja baterijama i koristiti IoT podatke za optimizaciju trajanja baterija.
– Sticanje znanja o analizi podataka iz IoT uređaja u svrhu unaprijeđenja dizajna i performansi električnih vozila.
– Sticanje znanja o integriraciji praktičnih rješenja primjene IoT rješenja u stvarnim situacijama električnih vozila.
– Sticanje znanja o budućim trendovovima u razvoju IoT tehnologija i njihov utjecaj na industriju električnih vozila.</td></tr>
<tr><td>Cilj održivog razvoja (SDG):</td><td>SDG7 – Osigurati pristup pouzdanoj, održivoj i suvremenoj energiji po pristupačnim cijenama za sve
SDG9 – Izgraditi izdržljivu infrastrukturu, promovirati uključivu i održivu industrijalizaciju i poticati inovativnost
SDG11 – Učiniti gradove i naselja inkluzivnim, sigurnim, prilagodljivim i održivim
SDG13 – Poduzeti hitne akcije u borbi protiv klimatskih promjena i njihovih posljedica</td></tr>
<tr><td>Metode izvođenja nastave:</td><td>Predavanja popraćena multimedijalnim prezentacijama
Auditorne vježbe sa analizom konkretnih primjera iz prakse</td></tr>
<tr><td>Metode provjere znanja sa strukturom ocjene:</td><td>
<table>
<tr><td>Aktivnost u toku predavanja</td><td>-</td><td>Pismeni ispit</td><td>50</td></tr>
<tr><td>Praktična nastava</td><td>-</td><td>Usmeni ispit</td><td>-</td></tr>
<tr><td>Kolokvijumi</td><td>35</td><td></td><td></td></tr>
<tr><td>Seminarski rad</td><td>15</td><td></td><td></td></tr>
<tr><td>Ukupno</td><td></td><td>Ukupno</td><td>100</td></tr>
</table>
</td></tr>
<tr><td>Literatura:</td><td>1. Hui-Huang Hsu, Chuan-Yu Chang "Big Data Analytics for Sensor-Network Collected Intelligence" -, ScienceDirect, 2017
2. David Hanes, Gonzalo Salgueiro, Patrick Grossetete "IoT Fundamentals: Networking Technologies, Protocols, and Use Cases for the Internet of Things“, 2017</td></tr>
</table>

	3. Yang Yang, Xu Chen, Rui Tan, Yong Xiao, "Intelligent IoT for the Digital World: Incorporating 5G Communications and Fog/Edge Computing Technologies," Wiley, 2021. 4. Souvik Pal, Supriyo Roy "IoT Solutions in Smart Cities: Technologies, Platforms, and Applications" 2023 by CRC Press

Šifra predmeta: **13-14-15-12TRTES020203**	**Naziv predmeta:** **UPRAVLJANJE TRANSPORTOM OPASNIH MATERIJA**		
Ciklus: II	**Godina: I**	**Semestar: II**	**Broj ECTS kredita: 6**
Status: Izbornı predmet		**Ukupan broj sati: 3+2+1** Predavanja:3 Vježbe:2 Laboratorijske vježbe:1	
Učesnici u nastavi	**Nastavnici i saradnici izabrani na oblast kojoj predmet pripada/predmet**		
Preduslov za upis:	NE		
Cilj (ciljevi) predmeta:	Ovaj kurs pruža dubinsko razumijevanje propisa, smjernica i najboljih praksi za siguran transport opasnih materija. Studenti će naučiti o klasifikaciji, pakovanju, označavanju, dokumentaciji i procedurama za hitne slučajeve povezane sa transportom opasnih materijala.		
Tematske jedinice: *(po potrebi plan izvođenja po sedmicama se utvrđuje uvažavajući specifičnosti organizacionih jedinica)*	1. Uvod u TDG menadžment, 2. Pregled međunarodnih i nacionalnih propisa, 3. Pravne odgovornosti pošiljalaca, prevoznika i primaoca, 4. Odgovornosti pošiljaoca i primaoca, 5. Klasifikacija i identifikacija opasnosti, 6. Pakovanje, skladištenje i obilježavanje, 7. Dokumenti za otpremu: nalozi za otpremu, tovarni listovi, TDG deklaracije, izvještaji, 8. Rukovanje i utovar: sigurno rukovanje opasnom robom, 9. Kompatibilnost različitih opasnih materija, 10. Utovar i osiguranje opasnih materija za transport pomorski, vazdušni i kopneni transport, 11. Monitoring vozila opasnih materija, reagovanje u vanrednim situacijama i upravljanje incidentima, 12. Procedure za reagovanje na izlivanje, curenje i nesreće, 13. Razmatranja okoliša i sigurnosti, 14. Procjena rizika, kontrola rizika i strategije upravljanja rizicima, 15. Održivost i najbolje prakse u upravljanju TDG-om.		
Ishodi učenja:	– Objasniti ključne propise i zakonske zahtjeve koji regulišu transport opasnog tereta; – Klasificirati opasnu robu prema njihovim karakteristikama opasnosti; – Odaberite odgovarajuće materijale za pakovanje i metode za različite vrste opasnih materija; – Primijeniti odgovarajuće tehnike, obilježavanja i označavanja opasnih materijala; – Razumjeti dokumentaciju i obaveze vođenja evidencije u TOM; – Primjena alata za planiranje ruta i alata za procjenu rizika;		

<table>
<tr><td></td><td>– Razviti i implementirati planove hitnog odgovora za incidente koji uključuju opasnu robu;
– Procijeniti ekološke i sigurnosne implikacije transporta opasnih materijala</td></tr>
<tr><td>Cilj održivog razvoja (SDG):</td><td>SDG3 – Osigurati zdrav život i promovirati blagostanje svih ljudi, svih životnih dobi
SDG9 – Izgraditi izdržljivu infrastrukturu, promovirati uključivu i održivu industrijalizaciju i poticati inovativnost
SDG11 – Učiniti gradove i naselja inkluzivnim, sigurnim, prilagodljivim i održivim
SDG13 – Poduzeti hitne akcije u borbi protiv klimatskih promjena i njihovih posljedica</td></tr>
<tr><td>Metode izvođenja nastave:</td><td>Nastavne metode:
– Predavanja: tradicionalna predavanja i korištenje multimedijalnih prezentacija, studije slučaja iz stvarnog svijeta i interaktivne diskusije za uključivanje studenata;
– Grupne diskusije: Omogućiie grupne diskusije o određenim temama ili studijama slučaja u vezi sa upravljanjem TDG-om. Ohrabrite učenike da podijele svoje uvide, postavljaju pitanja i raspravljaju o različitim pristupima rukovanju opasnim teretom;
– Studije slučaja: Predstavite studije slučaja iz stvarnog života incidenata koji uključuju transport opasne robe. Analizirajte šta je pošlo po zlu, identificirajte kršenja propisa i razgovarajte o tome kako su bolje prakse upravljanja mogle spriječiti incidente;
– Gostujući govornici i webinari: Pozovite stručnjake iz industrije, regulatorne službenike ili profesionalce iz transportnih kompanija da govore o svojim iskustvima i izazovima u upravljanju TDG-om. Ovo studentima pruža praktične uvide i mogućnosti umrežavanja. Organizirajte online webinare sa stručnjacima za upravljanje TDG-om iz različitih dijelova svijeta. Ovo izlaže studente globalnim perspektivama i praksama;
– Izleti: Organizujte posjete skladištima, distributivnim centrima ili transportnim kompanijama koje se bave rukovanjem opasnom robom. Ovo studentima pruža priliku da posmatraju praksu i propise iz stvarnog svijeta u praksi.
Metode ocjenjivanja:
– Kvizovi i testovi
– Praktične vježbe o pakovanju, označavanju i dokumentaciji
– Grupni projekti za izradu planova reagovanja u vanrednim situacijama
– Završni ispit koji pokriva sve teme kursa</td></tr>
<tr><td>Metode provjere znanja sa strukturom ocjene:</td><td>
<table>
<tr><td colspan="4">Ocjena znanja (maksimalni broj poena: 100)</td></tr>
<tr><td>Predispitne obaveze</td><td>Poeni</td><td>Finalni test</td><td>Poeni</td></tr>
<tr><td>Aktivnost tokom predavanja</td><td>-</td><td>Pismeni ispit</td><td>50</td></tr>
<tr><td>Praktična nastava</td><td>-</td><td>Usmeni ispit</td><td>-</td></tr>
<tr><td>Kolokvijumi</td><td>30</td><td></td><td></td></tr>
<tr><td>Seminarski rad</td><td>20</td><td></td><td></td></tr>
<tr><td>Ukupno</td><td></td><td>Ukupno</td><td>100</td></tr>
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<tr><td>Literatura:</td><td>1. Relevant online resources and guidelines from transportation regulatory authorities
2. IATA Dangerous Goods Regulations
3. IMDG Code (International Maritime Dangerous Goods Code)</td></tr>
</table>

4. Bukljaš S., Bukljaš Z.: „Zaštita u prometu“, Fakultet prometnih znanosti, Zagreb, 2015.
5. Cassini, P., Hall, R. and Pons, P.: „Transport of Dangerous Goods through Road Tunnels“, Quantitative Risk Assessment Model (Version 3.60), Reference Manual. OECD/PIARC/EU (CDROM), February 2003.
6. Council Directive 96/82/EC of 9 December 1996 on the control of major-accident hazards involving dangerous substances, Official Journal L 010, P. 0013 – 0033, 14 January 1997.
7. D. Knežević: „Intervencije u nesrećama pri prijevozu opasnih tvari“, Hrvatska vatrogasna zajednica, Zagreb, 2014.
8. Directive 2004/54/EC of the European Parliament and of the Council of 29 April 2004 on minimum safety requirements for tunnels in the Trans-European Road Network, Official Journal of the European Union L 167 of 30 April 2004.
9. Directive 2008/68/EC of the European Parliament and of the Council of 24 September 2008 on the inland transport of dangerous goods (Text with EEA relevance), 2008
10. General Guideline for the Calculation of Risks in the Transport of Dangerous Goods by Road, 84th and 85th sessions of the Working Party on the Transport of Dangerous Goods (WP.15) in May and October 2008.
11. Andrea M., Péter P.: „Management of risks associated with dangerous goods transportation-review, 2019.
12. Lindov, O.: „Sigurnost cestovnog saobraćaja“, Fakultet za saobraćaj i komunikacije, Univerzitet u Sarajevu, 2008.
13. Lindov, O., Kiso, F., Kosovac, A., Čolaković, A., Memić, B., Hasković, A., Begović, M., Omerhodžić, A., & Berković, M.: „Inovativne tehnologije u sigurnosti saobraćaja i transporta“, (p. 467). Fakultet za saobraćaj i komunikacije Univerziteta u Sarajevu, 2022.
14. Priručnik za prijevoznike i vozače vozila za prijevoz opasnih materija, IPI-Institut za privredni ižinjering, Zenica, 2009.
15. Risk Management Framework (https://transport.ec.europa.eu/transport-themes/transport-dangerous-goods/risk-management-framework_en)
16. Sporazum o prevozu opasnih materija u cestovnom saobraćaju (ADR)

Opis silabusa na studijskom programu Cestovni saobraćaj na engleskom jeziku

U nastavku su navedeni silabusi predmeta na Engleskom jeziku.

Course code: **01ATCOS020101**	**Course title:** **MANAGEMENT IN TRANSPORT AND COMMUNICATIONS**		
Level: II	**Year: I**	**Semester: I**	**Number of ECTS credits: 6**
Status: Mandatory Course		**Total number of contact hours: 90** Optional breakdown of hours by type: Lectures: 45 Tutorials: 45	
Course participants:	**Academic staff and associates selected in the field to which the course belongs/course**		
Prerequisite for enrollment:	None		
Course goal (goals):	The goal of the course is to familiarize students with the functioning of transport systems in market conditions and international standards to ensure effective and efficient operations. The course aims to equip students with knowledge about standards and standardization, as well as the interconnections between various parts of production and economic processes affected by technical standardization.		
Topics covered (Units of study): *(if necessary, the weekly implementation plan is established taking into account the specificities of organizational units)*	1. Basics of Management: Concept, management process, and interdependence with the organization. The concept of management and the management process. Characteristics of a modern manager. Managerial functions. 2. General and Specific Characteristics of Management in the Transport System: Issues of organization and management in the transport system. Definitions and content of management. Management and entrepreneurship in transport and telecommunications companies. 3. General and Specific Characteristics of Management in the Transport System: Managerial tasks in administrations, institutes, and agencies. Development of logistics management. Relationships between transport policy and management. Development of the transport system and spatial-economic structuring. 4. Managerial Concepts for Improving and/or Innovating Business Processes: Process-oriented management. Innovation and/or reengineering of business processes. 5. Planning as a Function and Activity of Management: Planning in a transport company. Policies and strategies of a transport company. Process approach to strategic planning. 6. Planning as a Function and Activity of Management; Strategic analysis of competitive structure in the transport sector. Scenario methods for selecting effective business strategies. 7. Organizational Structure and Processes: Concept and broader understanding of organization. Organizational structure. 8. Organizational Structure and Processes: Organizing relationships within the organization.		

	9. Organizational Structure and Processes: Process-based and knowledge-based organization. Examples of organizational structures in some transport and telecommunications companies. 10. Business Management and Motivation: Business management and leadership. 11. Business Management and Motivation: Influences on human behavior and motivation. 12. Human Resource Management: Human resource management as a function of management. 13. Human Resource Management: Activities in the human resource management process. Personal development of managers. 14. Managerial Control and Quality Management: Basics of modern standardization. Methods of adopting and labeling standards, levels of conformity, and terminology related to standard adoption. Quality infrastructure. 15. Managerial Control and Quality Management: Management system standards (MSS). Integrated management systems (IMS).
Learning outcomes:	Knowledge: Acquired knowledge will be used to recognize key technological processes and management models specific to transport systems. Skills: Ability to apply theoretical and practical knowledge in transport management. Competencies: A systematic approach to understanding standardization, mastering modern business terminology, and practical examples from the field of transport and communications will assist students in their integration into technical and other activities upon graduation and employment.
Sustainable Development Goal (SDG):	– SDG4 – Quality Education – SDG8 – Decent Work and Economic Growth – SDG9 – Industry, Innovation, and Infrastructure – SDG11 – Sustainable Cities and Communities – SDG 12 - Responsible Consumption and Production – SDG 16 - Peace, Justice, and Strong Institutions
Teaching methods:	Oral presentation, discussion, demonstration, group work.
Assessment methods with grading structure:	Assessment includes creativity in lectures and exercises through independent work, partial tests during the course, and the final exam. The criteria for monitoring and evaluating student performance are as follows: – Homework/Seminar/Practical Work: 15 points (%), passed if at least 55% is achieved. – First Partial Exam/Test/Knowledge Check: 35 points (%), passed if at least 55% is achieved. – Final Exam (Second Partial): 50 points (%), passed if at least 55% is achieved. – Final Exam (Comprehensive): 85 points (%), passed if at least 55% is achieved. The final exam is organized as written/oral. The student may take the material that was not covered and/or successfully completed during the semester. The required condition for a successful exam is achieving at least 55% of the total points on the partial and final exam parts. A sufficient condition is that the sum of points earned (through homework, attendance, partial, and final exams) is 55. Homework is organized

	through writing assignments and projects, with no option for resubmission. For students who did not successfully complete the partial exam, the final exam consists of the entire material covered during the course. The make-up exam is organized similarly to the final exam. Student performance after all forms of assessment is graded as follows: a) 10 (A) – Outstanding success with no or minor errors, 95-100 points; b) 9 (B) – Above average, with some errors, 85-94 points; c) 8 (C) – Average, with noticeable errors, 75-84 points; d) 7 (D) – Generally good, but with significant deficiencies, 65-74 points; e) 6 (E) – Meets minimal conditions, 55-64 points; f) 5 (F, FX) – Does not meet minimal conditions, less than 55 points. The overall evaluation of all student obligations during the semester, or the exam grade, is based on the total number of points (%) earned through fulfilling pre-exam obligations and taking partial and final exams, with a maximum of 100 points, determined by the following scale: Student Obligations – Attendance in lectures and exercises: - – Homework/Seminar/Practical Work: 15 points (%) – First Partial Exam/Test/Knowledge Check: 35 points (%) – Final Exam (Second Partial): 50 points (%) – Final Exam (Comprehensive): 85 points (%)
Literature:	Mandatory: 1. Vujadin B. Vešović, „MENADŽMENT U SAOBRAĆAJU“, Univerzitet u Beogradu, Saobraćajni fakultet, 1997. 2. Šefkija Čekić, Ivan Bošnjak, „MENADŽMENT U TRANSPORTU I KOMUNIKACIJAMA“, Fakultet za saobraćaj i komunikacije UNSA, Fakultet prometnih znanosti UNIZG, Sarajevo, Zagreb, 2000. Supplementary: 1. Alija Behmen, Sabira Salihović: MATERIJALI I ROBE U TRANSPORTU - Knjiga I, klasifikacija, standardizacija, identifikacija, Fakultet za saobraćaj i komunikacije Sarajevo i DES-Sarajevo, Sarajevo, 2007. 2. Alija Behmen, Sabira Salihović: MATERIJALI I ROBE U TRANSPORTU - Knjiga II, kvalitet: osnove, principi, kontrola, Fakultet za saobraćaj i komunikacije Sarajevo i DES-Sarajevo, Sarajevo, 2008. 3. International/Regional/National Standards

Course code: 02TRTOS020101	**Course title: SUSTAINABLE DEVELOPMENT AND ENVIRONMENTAL ENGINEERING**		
Level: II	**Year: I**	**Semester: I**	**Number of ECTS credits: 6**
Status: Mandatory Course		**Total number of contact hours: 90** Optional breakdown of hours by type: Lectures 30 Tutorials 20 Seminars 10 Fieldwork 10 Laboratory Tutorials 10 Practice 10	

Course participants:	**Academic staff and associates selected in the field to which the course belongs/course**
Prerequisite for enrollment:	None
Course goal (goals):	Acquisition of educational forms in the implementation of programs in the elements of sustainable development and environmental engineering, as well as practical analyses, studies and projects in the field of sustainable development and environmental engineering.
Topics covered **(Units of study):** *(if necessary, the weekly implementation plan is established taking into account the specificities of organizational units)*	1. Introduction – basics of sustainable development and environmental engineering 2. Legal Framework in the Field of Sustainable Development and Environmental Engineering 3. Air Pollution from Traffic - Air Quality Monitoring 4. Contaminant Detection Methods 5. CORINAIR/ COPERT 6. Elements and Method of Making Noise Maps 7. Elements of Preparing an Environmental Impact Study 8. Public urban passenger transport, mobility and sustainable development 9. Energy efficiency, eco test and eco driving 10. NEAP, KEAP, LEAP, traffic and transportation 11. SEAP, Traffic & Transportation 12. SUMP_ Traffic & Transportation 13. SECAP_ Traffic & Transportation 14. Low-carbon and zero-emission transport 15. Examples of field research in the field of sustainable development and environmental engineering
Learning outcomes:	Knowledge: Theoretical and practical knowledge in the field of the impact of sustainable development and environmental engineering. Basic regulations, rules, methods and procedures in the field of assessment and analysis of the state of sustainable development. Skills: Ability to apply theoretical and practical knowledge in the field of sustainable development and environmental engineering in the function of preserving and protecting the economic and other development of society on the one hand and improving and developing sustainable transport on the other. Competencies: Ability to independently understand and use regulations, use professional literature, apply methods and procedures, measure and research, prepare analyses, assessments and practical solutions, preventive action, and procedures necessary for the analysis, assessment and management of the field of sustainable development and environmental engineering.
Sustainable Development Goal (SDG):	– SDG4 – Quality Education – SDG5 - Gender Equality – SDG8 - Decent Work and Economic Growth – SDG9- Industry, Innovation and Infrastructure – SDG11 - Sustainable Cities and Local Communities – SDG12-Sustainable consumption and production – SDG13-Climate Action – SDG17- Partnerships for the Goals
Teaching methods:	Oral presentation with presentation and presentation of various analyses, studies, models and methods in the field of environmental engineering with the use of video and audio recordings, software, measuring equipment, and independent presentation of individual specific research, Initiating discussions and discussions on practical problems, individual observations from different environments, making independent analyses, research, measurements and modelling in the field

<table>
<tr><td></td><td>of environmental engineering and sustainable development.</td></tr>
<tr><td>Assessment methods with grading structure:</td><td>Assessment of creativity in classes and exercises with the preparation of independent papers, evaluation of the partial test during the class as well as the evaluation of the final exam. The criterion for monitoring the work and evaluation of the student during the course is as follows:
– Seminar 15 points (%), passed if won over 50%.
– I Partial exam/test/knowledge test/35 points (%), is passed if more than 50% is scored.
– Final exam (II Partial) 50 points (%), passed if won over 50%.
– Final exam (Integral) 85 points (%), passed if won over 50%.
The total number of points (%) that a student can achieve during the course is a maximum of 50 points (%), which together with the Final (II partial) makes 100 points (%). For students who have not passed the I Partial Exam, the Final Exam (Integral) is organized from the entire material covered during classes and exercises, and is evaluated with 85 points (%), which with the seminar paper/practical work makes 100 points (%).
The final success of the student after all the foreseen forms of examination is evaluated and evaluated by the grading system as follows: a) 10 (A) - exceptional success without errors or with minor errors, carries 95-100 points; b) 9 (B) - above average, with some error, carries 85-94 points; c) 8 (C) - average, with noticeable errors, carries 75-84 points; d) 7 (D) - generally good, but with more significant drawbacks, carries 65-74 points; e) 6 (E) - meets the minimum requirements, carries 55-64 points; f) 5 (F, FX) - does not meet the minimum requirements, less than 55 points.
The total evaluation of all student obligations during the semester, i.e. the grade on the exam, is based on the total number of points (%) that the student has acquired by fulfilling the pre-exam obligations and passing the partial and final exam, according to the quality of the acquired knowledge and skills, and contains a maximum of 100 points, and is determined according to the following scale:

<table>
<tr><td>The Student's Responsibilities</td><td>Score (%)</td></tr>
<tr><td>Attendance at lectures and exercises
(attendance at all forms of teaching is mandatory at least 80% and this is a condition for the certification/signature of regular attendance)</td><td>0 points</td></tr>
<tr><td>Seminar</td><td>15 points (%)</td></tr>
<tr><td>I Partial Exam / Test / Knowledge Assessment /</td><td>35 points (%)</td></tr>
<tr><td>Final exam (II partial)</td><td>50 points (%)</td></tr>
<tr><td>Final exam (Integral)</td><td>85 points (%)</td></tr>
</table>
</td></tr>
<tr><td>Literature:</td><td>Mandatory:
1. Lindov, O.: Transport i okoliš, univerzitetski udžbenik Fakultet za saobraćaj i komunikacije Sarajevo, 2011.
2. Lindov, O.: Uticaj cestovnih vozila i cestovne infrastrukture na ekološke parametre. Međunarodni naučni skup “Ekološki problemi savremenog saobraćaja”, Sarajevo, 2003.
3. Lindov, O., Omerhodžić A.: Održivi razvoj i okolišni inžinjering. Skripta vježbi i testova, Fakultet za saobraćaj i komunikacije, Sarajevo, 2020.
Supplementary:
1. EC (EvropeanCommission), Directorate General Transport, 1996, Transport Research APAS Road Transport: Assessment of road transport models and systems architectures, VII-31,. ECSCEEC- EAEC, Brussels – Luxembourg.
2. EC (Evropean Commission), Directorate General Transport, 1996, Transport</td></tr>
</table>

	RTD Programme, Summary of Projects resulting from the First Call for Proposals, p.29. 3. Prascevic M.R., Cvetkovic D.S., Stojanovic V.O., (1997), "Mathematical models for describing road traffic noise », Proceedings Inter-Noise 97, Budapest. 4. Pronello C., Iannelli F., 2002. Modelli di previsione del rumore da trafficoincontesti operativi e territorialidifferenti, inCollanaTrasporti, Editore Franco Angeli 5. Pronello C., André M., Pollutant emissions estimation in road transport models, Report INRETSLTE n° 2007, March 2000, BRON Cedex – France, 113 pp. 6. Pronello C., André M., Estimation tool of traffic pollutant emissions in function of macroscopic driving Promjenljive, Report INRETS-LTE, n° 2006, March 2000, BRON Cedex – France, 91 pp.

Course code: **03TRTOS020101**	**Course title:** **LOGISTICS AND INTELLIGENT TRANSPORT SYSTEMS**		
Level: II	**Year: I**	**Semester: I**	**Number of ECTS credits: 6**
Status: Mandatory Course		**Total number of contact hours: 90** Optional breakdown of hours by type: Lectures 45 Tutorials 30 Seminars 15	
Course participants:	**Academic staff and associates selected in the field to which the course belongs/course**		
Prerequisite for enrollment:	None		
Course goal (goals):	The goal of the course is to acquire knowledge from the field of application of intelligent transport systems in logistics systems, which enables the digitization of logistics processes.		
Topics covered (Units of study): *(if necessary, the weekly implementation plan is established taking into account the specificities of organizational units)*	1. Basic assumptions for the development and concept of smart logistics 2. Technological stages of logistics development 3. Digital transformation of logistics 4. Organization, planning and management in intelligent 5. logistics systems 6. Intelligent cargo and transport equipment 7. Redesigning transport and logistics processes with ITS 8. systems 9. Smart warehouses in logistics 10. Advanced ethnology in logistics 11. Augmented reality technology in logistics 12. Blockchain technology in logistics 13. Logistics software systems 14. Logistics platforms 15. City logistics and ITS 16. Artificial intelligence and automatic technologies 17. identification in intelligent logistics 18. Future challenges of the digital transformation of logistics		
Learning outcomes:	Knowledge: The subject Intelligent transport systems and logistics should provide the necessary level of knowledge about technologies, functions and students of ITS in logistics systems, which will enable		

	planning, development and implementation of intelligent logistics systems and the implementation of digitization processes in logistics systems. Skills: The subject intelligent transport systems and logistics enables the acquisition of skills necessary for measuring, analyzing and evaluating efficiency, safety, environmental impact and economic benefits from the implementation of ITS in logistics systems. Competences: Through the teaching process of lectures, exercises, and seminar work, students should acquire appropriate competencies for designing, developing and managing logistics processes using intelligent transport systems.
Sustainable Development Goal (SDG):	„SDG3 – Good Health and Well-being“; „SDG4 – Quality Education“
Teaching methods:	Lectures, exercises and seminar work.
Assessment methods with grading structure:	1. Attendance at classes and semester work 15 points 2. First knowledge test 35 points 3. Final knowledge test 50 points
Literature:	Mandatory: 1. Teaching material available on the online platform for study of the Faculty of Traffic and Communications Supplementary: 1. Mac Sullivan, Johannes Kern: The Digital Transformation of Logistics, IEEE Press, New Jersey, 2021 2. Rosanna Fornasiero: Next Generation Supply Chains, Springer, Cham, 2021. 3. Albert Tan, Sameer Shukkla : Title: Digital transformation of the supply chain : a practical guide for executives, World Scientific Publishing, London, 2021. 4. John M. Longshore and Angela L.: Managing Logistics Systems, Routledge, New York, 2022. 5. - Anthony M. Pagano, Matthew Liotine: Technology in Supply Chain Management and Logistics, elsevier, Amsterdam, 2020,

Course code: **04TRTOS020101**	**Course title:** **PLANNING TRAFFIC AND TRANSPORT SYSTEMS IN ROAD TRAFFIC**		
Level: II	**Year: I**	**Semester: I**	**Number of ECTS credites: 6**
Status: Mandatory Course		**Total number of contact hours: 150** Optional breakdown of hours by type: Lectures 30 Tutorials 30 Seminars 15 Independent work 30	
Course participants:	**Academic staff and associates selected in the field to which the course belongs/course**		
Prerequisite for enrollment:	None		
Course goal (goals):	Acquisition of educational forms in the implementation of programs related to traffic and transport system planning. Gaining knowledge and skills in traffic and transport system planning.		
Topics covered (Units of study):	1. Introduction to Planning and Designing Traffic and Transport Systems 2. Traffic and Transport Systems		

(if necessary, the weekly implementation plan is established taking into account the specificities of organizational units)	3. Elements and Characteristics as the Basis for Planning and Designing Traffic and Transport Systems 4. Passenger and Freight Flows in the Network of Roads and Terminals 5. Demand and Supply Research in Traffic and Transport 6. Analysis of Traffic and Transport Conditions 7. Methods for Planning Demand and Supply of Services in Traffic and Transport 8. New Technologies in Planning Demand and Supply in Traffic and Transport 9. Planning and Designing Systems in Urban Traffic and Transport 10. Project Planning in Traffic and Transport 11. New Technologies in Project Planning
Learning outcomes:	Through lectures, tutorials and practical work, students should acquire the necessary knowledge related to planning systems in traffic and transport of goods and passengers.nStudy and practical application should ensure that students achieve the required level of knowledge to successfully plan and design traffic and transport systems.
Sustainable Development Goal (SDG):	– SDG4: Ensure inclusive and quality education, and promote lifelong learning opportunities for all people, of all ages – SDG9: Industry, Innovation, and Infrastructure – SDG11: Sustainable Cities and Communities – SDG12: Responsible Consumption and Production – SDG13: Climate Action
Teaching methods:	Lectures, tutorials and preparation of seminars with a practical focus. Analytical and demonstrative approach.
Assessment methods with grading structure:	Student performance is monitored by assigning points for each form of activity and knowledge assessment during the semester, as well as on the final exam after the end of the semester according to the following monitoring elements: – Homework/Seminar Paper/Practical Work: 15 points (%), evaluated if more than 50% is achieved – First Partial Exam/First Test/First Knowledge Check: 35 points (%), evaluated if more than 50% is achieved – Final Exam (Second Partial): 50 points (%), evaluated if more than 50% is achieved – Final Exam (Comprehensive): 85 points (%), evaluated if more than 50% is achieved The total number of points (%) that a student can achieve through the aforementioned monitoring during classes is a maximum of 50 points (%), which, combined with the Final (Second Partial) Exam, totals 100 points (%). For students who did not pass the First Partial Exam, the Final Exam (Comprehensive) covers all the material covered during classes and exercises and is worth 85 points (%), which, combined with the seminar paper/practical work, totals 100 points (%). The final success of students after all the prescribed forms of knowledge assessment is evaluated and graded according to the following grading system: a) 10 (A) - Outstanding performance with no errors or only minor errors, earns 95-100 points b) 9 (B) - Above average, with some errors, earns 85-94.99 points c) 8 (C) - Average, with noticeable errors, earns 75-84.99 points d) 7 (D) - Generally good, but with significant shortcomings, earns 65-

	74.99 points e) 6 (E) - Meets the minimum requirements, earns 55-64.99 points f) 5 (F, FX) - Does not meet the minimum requirements, less than 55 points.
Literature:	Mandatory: 1. Mehanović, M., 2017. „Planiranje u saobraćaju, prevozu i komunikacijama ". Fakultet za saobraćaj i komunikacije u Sarajevu, Sarajevo. 2. Padjen J.: Osnove prometnog planiranja, Zagreb, 1986. 3. Mehanović, M., 2015. „Mreže u saobraćaju, prevozu i komunikacijama". Fakultet za saobraćaj i komunikacije u Sarajevu, Sarajevo. Supplementary: 4. Padjen J.: Metode prostorno-prometnog planiranja Ekonomski institut, Zagreb, 1978. 5. Mehanović, M., 2011. „Planiranje ponude usluga u gradskom prometu putnika". Fakultet za saobraćaj i komunikacije u Sarajevu, Sarajevo. 6. Mehanović, M.: "Zadaci i primjeri iz teorije i prakse u javnom gradskom prevozu putnika", Fakultet za saobraćaj i komunikacije, Sarajevo, 2005. 7. Meyer, M.D. Miller, E.J.: Urban Transportation Planning, McGraw-Hill, 1984. 8. Kuzović, Lj.; Topolnik, D.: Kapacitet drumskih saobraćajnica, Građevinska knjiga Beograd, 1989. 9. Jovanović N.: Planiranje saobraćaja, Saobraćajni fakultet, Beograd, 1990. 10. Jović J.: Planiranje saobraćaja u gradovima-praktikum, Saobraćajni fakultet, Beograd, 1996. 11. Steierwald, G.; Kűnne, H.D.: *Stadtverkehrs-planung*, Stuttgart, 1993.g. 12. HCM2000*; Capacity Manual,* Special Report 209, Transportation Research Board, Washington D.C., 1994. 13. HZDP Zagreb, Časopisi

Course code: 05TRTOS020101	**Course title: ORGANIZATION AND MANAGEMENT OF PASSENGER TRANSPORT IN CITIES**		
Level: II	**Year: I**	**Semester: I**	**Number of ECTS credites: 6**
Status: Mandatory Course		**Total number of contact hours: 105** Optional breakdown of hours by type: Lectures 45 Tutorials 30 Laboratory tutorials 15 Seminars 15 Independent work 30	
Course participants:	**Academic staff and associates selected in the field to which the course belongs/course**		
Prerequisite for enrollment:	None		
Course goal (goals):	Acquistion of educational forms in the implementation of programs related to the organization and management of passenger transport in cities. Gaining knowledge and skills in the		

	organization and management of passenger transport in cities.
Topics covered (Units of study): *(if necessary, the weekly implementation plan is established taking into account the specificities of organizational units)*	1. Passenger Transport in Cities and Urban Development 2. Urban Public Transport System as a Management Object 3. Planning in Passenger Transport in Cities 4. Organization in Passenger Transport in Cities 5. Economic Aspects of Passenger Transport in Cities 6. Management of Passenger Transport in Cities 7. New Technologies in Passenger Transport in Cities
Learning outcomes:	Through lectures, tutorials and practical work, students should acquire the necessary knowledge related to the organization and management of passenger transport in cities. Study and practical application should ensure that students achieve the required level of knowledge to successfully and optimally organize and manage passenger transport processes in cities.
Sustainable Development Goal (SDG):	– SDG4: Ensure inclusive and quality education, and promote lifelong learning opportunities for all people, of all ages – SDG9: Industry, Innovation, and Infrastructure – SDG11: Sustainable Cities and Communities – SDG12: Responsible Consumption and Production – SDG13: Climate Action
Teaching methods:	Lectures, tutorials and preparation of seminars with a practical focus. Analytical and demonstrative approach.
Assessment methods with grading structure:	Student performance is monitored by assigning points for each form of activity and knowledge assessment during the semester, as well as on the final exam after the end of the semester according to the following monitoring elements: – Homework/Seminar Paper/Practical Work: 15 points (%), evaluated if more than 50% is achieved – First Partial Exam/First Test/First Knowledge Check: 35 points (%), evaluated if more than 50% is achieved – Final Exam (Second Partial): 50 points (%), evaluated if more than 50% is achieved – Final Exam (Comprehensive): 85 points (%), evaluated if more than 50% is achieved The total number of points (%) that a student can achieve through the aforementioned monitoring during classes is a maximum of 50 points (%), which, combined with the Final (Second Partial) Exam, totals 100 points (%). For students who did not pass the First Partial Exam, the Final Exam (Comprehensive) covers all the material covered during classes and exercises and is worth 85 points (%), which, combined with the seminar paper/practical work, totals 100 points (%). The final success of students after all the prescribed forms of knowledge assessment is evaluated and graded according to the following grading system: a) 10 (A) - Outstanding performance with no errors or only minor errors, earns 95-100 points b) 9 (B) - Above average, with some errors, earns 85-94.99 points c) 8 (C) - Average, with noticeable errors, earns 75-84.99 points d) 7 (D) - Generally good, but with significant shortcomings, earns 65-74.99 points e) 6 (E) - Meets the minimum requirements, earns 55-64.99 points

	f) 5 (F, FX) - Does not meet the minimum requirements, less than 55 points.
Literature:	Mandatory: 1. Mehanović, M., 2011. „Planiranje ponude usluga u gradskom prometu putnika“. Fakultet za saobraćaj i komunikacije u Sarajevu, Sarajevo. 2. Mehanović, M.: “Zadaci i primjeri iz teorije i prakse u javnom gradskom prevozu putnika”, Fakultet za saobraćaj i komunikacije, Sarajevo, 2005. 3. Banković, R.: Planiranje javnog gradskog putničkog prevoza, IRO Građevinska knjiga, Beograd, 1984. Supplementary: 1. Mehanović, M., 2017. „Planiranje u saobraćaju, prevozu i komunikacijama “. Fakultet za saobraćaj i komunikacije u Sarajevu, Sarajevo. 2. Jović J.: Planiranje saobraćaja u gradovima- praktikum Saobraćajni fakultet, Beograd, 1996. 3. Vučić, V.: Urban Public Transportation, Sistems and Technology, Prentice Hall International England, 1981. 4. HZDP Zagreb, Časopisi

Course code: 06TRTOS020102	**Course title: INTERMODAL TRANSPORT**		
Level: II	**Year: II**	**Semester: II**	**Number of ECTS credits: 6**
Status: Mandatory Course		**Total number of contact hours: 90** Optional breakdown of hours by type: Lectures: 45 Tutorials: 30 Seminars: 15	
Course participants:	**Academic staff and associates selected in the field to which the course belongs/course**		
Prerequisite for enrollment:	None		
Course goal (goals):	The curriculum covered by the content should enable students to become familiar with modern transport chains, the basics of technological design and optimization of transport processes, as well as contemporary technological solutions offered within various technologies of intermodal transport. This includes the application of logistics principles and the opportunities provided by new information and telecommunications technologies.		
Topics covered (Units of study): *(if necessary, the weekly implementation plan is established taking into account the specificities of organizational units)*	1. Technological Changes; Classical Transport Chain; Rationalization; Modern Transport Chain 2. Systematic Approach to Analyzing the Transport Process as a Complex Technological System 3. Goods Flows; Industrial Transport; Load Units 4. Pallet Transport System, Pallet Chain 5. Container Transport System, Typical Technologies for Implementing Container Transport Chains 6. Vehicle-to-Vehicle System 7. RO-RO Transport System, Barge Transport System for River Traffic 8. Storage, Inventory, Warehouse Capacity, Warehouse System Design 9. Logistics and Logistical Principles		

	10. EU Transport Policy, European Concept of Intermodality 11. Land Terminals, Evaluation of Terminal Performance, Queueing Theory 12. Port Container Terminals – Storage Yards in Terminals 13. Components of Logistical Services – RTC 14. Elements of Modern Intermodal Transport 15. ITS and the Application of Telematics in Modern Intermodal Transport
Learning outcomes:	Knowledge: Students will gain a fundamental understanding of the basics of intermodal transport, including technological changes, organization of transport chains, and integration of different transport modes. They will understand key principles of storage, logistics, container and pallet systems, as well as European transport policy with a focus on intermodality. Skills: Students will develop practical skills in analyzing and optimizing transport processes, with an emphasis on using modern technologies such as ITS and telematics. They will acquire knowledge on how to efficiently organize goods flows, manage terminals, and utilize various transport systems. Competencies: Students will be capable of applying the acquired knowledge and skills to manage complex transport chains, optimize logistical operations, and integrate different transport modes in modern industrial and commercial environments.
Sustainable Development Goal (SDG):	SDG7 – Affordable and Clean Energy; SDG9 – Industry, Innovation, and Infrastructure; SDG12 – Responsible Consumption and Production; SDG17 – Partnership for the Goals.
Teaching methods:	During the implementation of the program, the instructor presents individual thematic units (ex cathedra), provides students with access to educational video recordings (video presentations) related to the subject area, and organizes discussions on assigned topics (interactive teaching). In the exercises, the instructor reviews and solves examples and tasks in accordance with the theoretical material, assists students in independently solving tasks, and in preparing programs and seminar papers.
Assessment methods with grading structure:	Evaluation of activities in lectures and exercises, along with the preparation of independent work, assessment of the mid-term test during the course, and the final exam. The criteria for monitoring and assessing student performance during the course are as follows: – Seminar/Fieldwork/Lab Exercises/Practice (written and oral assessment) – 15 points (%), passed if over 50% is achieved. – Mid-term exam/test/knowledge check (written assessment) – 35 points (%), passed if over 50% is achieved. – Final exam (Second Mid-term) (written assessment) – 50 points (%), passed if over 50% is achieved. – Final exam (Comprehensive) (written assessment) – 85 points (%), passed if over 50% is achieved. The total number of points (%) a student can achieve through this monitoring system during the course is a maximum of 50 points (%), which combined with the Final (Second Mid-term) totals 100 points (%). For students who did not pass the First Mid-term exam, the Final (Comprehensive) exam is organized covering all the material taught during lectures and exercises and is worth 85 points (%), combined with the seminar/practical work to make a total of 100 points (%).

	To pass the course, students must pass each of the following parts: the seminar paper, the first mid-term exam (test), and the final exam (second mid-term or comprehensive). The evaluation of the seminar paper and the first mid-term exam (test) is conducted during the course. Students who pass the first mid-term exam only take the second mid-term exam in the final exam, while those who do not pass the first mid-term exam will take the comprehensive final exam, which consists of both the first and second mid-term exams. Students who did not pass the exam in the previous academic year but fulfilled certain obligations and earned points can carry them over to the current academic year. Students who wish to carry over points must inform the course instructor at the start of the semester, by the end of the first week of lectures. Points may be carried over only once. The final student grade after all forms of knowledge assessment will be evaluated and graded according to the following system: a) 10 (A) – exceptional performance with no or minimal errors, 95-100 points; b) 9 (B) – above average, with some errors, 85-94 points; c) 8 (C) – average, with noticeable errors, 75-84 points; d) 7 (D) – generally good, but with significant deficiencies, 65-74 points; e) 6 (E) – meets minimum requirements, 55-64 points; f) 5 (F, FX) – does not meet minimum requirements, less than 55 points. The total assessment of all student obligations during the semester, i.e., the exam grade, is based on the total number of points (%) the student has achieved by fulfilling pre-exam obligations and passing the mid-term and final exams. This totals a maximum of 100 points, and is determined according to the following scale: <u>Student Obligations Points (%)</u> Attendance in lectures and exercises ……..... 0 points Minimum 80% attendance at all forms of classes is mandatory, and this is a condition for course certification/signing off on proper attendance. Seminar Paper/Fieldwork/Lab Exercises/Practice (written and oral assessment).....15 points (%) First Mid-term Exam (written).....35 points (%) Final Exam (Second Mid-term) (written).....50 points (%) Final Exam (Comprehensive) (written).....85 points (%)
Literature:	Mandatory: 1. Dalla Chiara B., Ercolani F., Gačanin E., Kiso F.: Intermodal Transport, Education and Culture TEMPUS, Sarajevo 2004. 2. Perišić R.: Modern Strategies and Technologies for Transport Development, SANU, Belgrade, 2002. 3. Perišić R.: Quality Service Systems, Logistics, and Informatics, SANU, Belgrade, 2002. 4. Terminology in Combined Transport: UN/ECE, Translation by Kiso F., Education and Culture TEMPUS, Sarajevo, 2004. 5. Kiso, F., Karičić, S., Omerhodžić, A.: Multimodal Transport, Faculty of Traffic and Communications, Sarajevo, 2023. Supplementary: 1. Marković I.: New Transport Technologies, Faculty of Transport Sciences Zagreb, 1985. 2. Kiso, F.: "Logistics - Fundamental Concepts," Lecture Notes, FSK Sarajevo, 2019. 3. Kiso, F.: "Storage and Inventory Theory," Lecture Notes, FSK Sarajevo, 2016.

Course code: 07TRTOS020102	Course title: INFORMATION TECHNOLOGIES AND FREIGHT FORWARDING		
Level: II	**Year: I**	**Semester: II**	**Number of ECTS credits: 6**
Status: Mandatory and Elective Course		**Total number of contact hours: 90** Optionally elaborate the distribution of hours by type: Lectures 45 Exercises 30 Seminar and project task: 15	

Course participants:	**Academic staff and associates selected in the field to which the course belongs/course**
Prerequisite for enrollment:	None
Course goal (goals):	Familiarization with modern information and communication technologies applied in the field of logistics and freight forwarding, specific software tools, and the methods and effects of their application.
Topics covered (Units of study): *(if necessary, the weekly implementation plan is established taking into account the specificities of organizational units)*	1. Introduction 2. Identification of technological processes in logistics and freight forwarding 3. Identification of key stakeholders in the logistics and freight forwarding chain 4. Theoretical foundations of current information technology solutions applied in freight forwarding 5. Importance and application of software applications in managing logistics and freight forwarding systems and implementation of best practices 6. Methodological approaches in designing information technology solutions in logistics and freight forwarding 7. CRM (Customer Relationship Management) in Freight Forwarding and Logistics Companies Planning and optimizing forwarding services - maximizing utility and reducing costs of ordering, booking, and shipping processes 8. Management of import, export, and global foreign trade exchange (harmonized tariffs, foreign trade agreements, INCOTERMS) 9. Software applications for business-to-business SCM (Supply Chain Management) 10. Software applications for managing customs procedures based on EU legislation 11. Software applications for managing warehousing operations 12. Software applications for managing the transport chain 13. Web applications and online services for foreign trade compliance, tariff classification, import-export documentation, electronic reporting, verification 14. Integrating segmented software applications into a holistic logistics-freight forwarding information system (end-to-end management)
Learning outcomes:	Knowledge: Through lectures, exercises, laboratory work, and practical activities, students should acquire the necessary knowledge and skills for practical application through: the development of IT and evaluation of its effects in logistics forwarding, as well as the independent formulation of research objectives and the application of appropriate methods and models for their realization. Skills: A systemic approach to designing IT business processes in logistics forwarding and understanding algorithms as the basis for forwarding software solutions; identifying and using relevant IT

	solutions in the field of logistics forwarding, critical analysis, evaluation, and synthesis of available knowledge; developing and applying forwarding software management models, and presenting acquired knowledge to professional and scientific audiences. Competencies: Application of acquired knowledge in specific models.
Sustainable Development Goal (SDG):	SDG 4: Quality Education - Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. SDG 8: Decent Work and Economic Growth - Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all. SDG 9: Industry, Innovation, and Infrastructure - Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation. SDG 12: Responsible Consumption and Production - Ensure sustainable consumption and production patterns. SDG 16: Peace, Justice, and Strong Institutions - Promote peaceful and inclusive societies for sustainable development, provide access to justice for all, and build effective, accountable, and inclusive institutions at all levels.
Teaching methods:	During the course delivery, the instructor presents individual thematic units (ex cathedra), allows students to follow educational video content (DVDs, video presentations) related to the subject area, and organizes discussions on a given topic (interactive teaching). In practical classes, the discussion and resolution of examples and tasks related to theoretical topics are conducted, and assistance is provided to students in independently solving tasks, and in the preparation of programs, projects, and seminar papers.
Assessment methods with grading structure:	Criteria for assessing and grading students' work during the course are as follows: Seminar Paper / Project Task: 0 to 15 points, passed if over 50% is achieved First Test / First Knowledge Check / First Partial Exam: 0 to 35 points, passed if over 50% is achieved Final Exam – Written exam: 20 points Final Exam – Oral exam: 30 points Final Exam (Integral) – Written exam: 40 points Final Exam (Integral) – Oral exam: 45 points To pass the exam, the student must pass the oral part of exam. The total number of points a student can achieve during the course is a maximum of 50 points. The final exam includes the material that the student did not pass in the partial exam, which means it covers the second part of the material (second partial exam) which is valued at 50 points or consists of the entire material, i.e., both the first and second partial exams. The total evaluation of all student obligations during the semester, i.e., the exam grade, is based on the total number of points (%) that the student has earned by fulfilling pre-exam obligations, passing the partial and final exams. Based on the quality of the acquired knowledge and skills, the student can achieve a maximum of 100 points, according to the following scale: Grading Structure: Points (%) Seminar Paper / Project Task: 15 points (%) First Test / First Knowledge Check (First Partial Exam): 35 points (%) Final Exam (Second Partial Exam): 50 points (%) The necessary condition for successfully completing the exam is a result

	of 55 points, with a minimum of 50% required on each part of the exam (activity, partial exam, final written exam). This means that to pass the exam, the student must meet the following conditions: Activity (Seminar Paper / Project Task): 7,5 points First Test / First Knowledge Check / Partial Exam: 17.5 points Final Exam (Second Partial Exam) – Written Part: 10 points Students who pass the partial exam only need to take the second part of the material (the part not covered in the partial exam) during the final exam. Students who do not pass the partial exam will take the entire material during the final exam, with the criteria for passing the exam remaining identical. The final exam is organized as a written and/or oral exam. Activity can be tracked through homework, seminar papers, project tasks, or quizzes. Note: Students are required to attend at least 80% of the total class hours, and attendance is a condition for verifying proper class participation. In justified cases (illness), a student may be excused from classes, for which they must provide a medical excuse. Seminar papers and homework will be graded only if submitted by the defined deadlines. Late submissions will not be graded. Final student performance after all forms of knowledge assessment is evaluated and graded according to the following system: a) 10 - Exceptional performance with no errors or only minor errors, 95-100 points; b) 9 - Above average, with some errors, 85-94 points; c) 8 - Average, with noticeable errors, 75-84 points; d) 7 - Generally good, but with significant shortcomings, 65-74 points; e) 6 - Meets minimum requirements, 55-64 points; f) 5 - Does not meet minimum requirements, less than 55 points.
Literature:	Mandatory: 1. R. Zelenika: Logistics Forwarding, Faculty of Economics, Zagreb, 2000. 2. Zelenika, R.: Logistics Systems, Faculty of Economics in Rijeka, 2005. 3. Gordana M. Radivojević, Information Management in Logistics. Belgrade 2023. 4. Ivanković, Č.: Forwarding and Logistics, Faculty of Transport Sciences, Zagreb, 2005. 5. R. Zelenika: International Forwarding, Faculty of Economics, Zagreb, 1996. 6. Deljanin: Logistics in Transport and Communications, Script, FSK, 2013. 7. Deljanin: Logistics Systems, Script, FSK, 2014. Supplementary: 1. Andrijanić I., Aržek Z., Prebežac D., Zelenika R.: Transport and Forwarding Business, Zagreb, 2001. 2. Z. Aržek, G. Badovinac: Transport and Insurance, Publishing and Instruction Bureau, Zagreb, 1986. 3. J. Mađarić: International Forwarding, Faculty of Transport Sciences, Zagreb, 1991. 4. Grabovac: Responsibility of Multimodal Transport Entrepreneurs, Traffic Faculty, Split, 1986. 5. Shipping and Logistics Management, Y H V Lun; Kee-hung Lai; T C E Cheng, Publisher: New York; London: Springer, 2010. 6. International Logistics Supply Chain Outsourcing: From Local to

	Global, Alan Rushton; Steve Walker, Publisher: London: Kogan Page, 2007. 7. Transportation Management with SAP TM, Bernd Lauterbach, Stefan Sauer, Jens Kappauf, Jens Gottlieb, Dominik Metzger, Christopher Sürie, 2nd, updated and revised edition, 2016. 8. Warehouse Management with SAP EWM, Balaji Kannapan, Hari Tripathy, Vinay Krishna, 2nd, updated and revised edition, 2016. Journals: – International Journal of Physical Distribution – Computers and Operations Research – International Journal of Information Management – European Journal of Operational Research – Journal of Business Logistics

Course code: **08TRTOS020102**	**Course title:** **ROAD NETWORK PLANNING AND CAPACITIES**		
Level: II	**Year: I**	**Semester: II**	**Number of ECTS credits: 6**
Status: Mandatory Course		**Total number of contact hours: 90** Lectures: 45 Exercises: 30 Seminar: 15	
Course participants:	**Academic staff and associates selected in the field to which the course belongs/course**		
Prerequisite for enrollment:	Attendance and active participation in lectures and exercises are mandatory, as well as the preparation of a seminar paper and independent exercise tasks.		
Course goal (goals):	The teaching material included in the content should enable students to become familiar with the characteristics of road networks from the aspects of planning, dimensioning and management. Detailed familiarization with traffic-technical calculation procedures for individual segments of the traffic network.		
Topics covered (Units of study): *(if necessary, the weekly implementation plan is established taking into account the specificities of organizational units)*	1. The task and purpose of traffic-technical calculations in different phases and conditions of traffic network planning and operation. 2. The capacity of road sections. 3. Practical capacity of highways. 4. Capacity of two-lane roads for two-way traffic, multi-lane roads, and roads with three lanes for two-way traffic. 5. Level of traffic service for road sections. 6. Capacity of ramps and ramp connections. 7. Weaving zones. 8. Surface intersections, classification, design, technical elements. 9. Capacity and service level of signalized intersections. 10. Capacity and service level of unsignalized intersections. 11. Capacity of roundabouts. 12. Urban and suburban arterials. 13. Capacity and service level for public passenger transport on street surfaces. 14. Pedestrian flows and pedestrian traffic facilities. 15. Bicycle flows, methodological approach, and methods for defining bicycle lanes.		
Learning outcomes:	Through the teaching process, exercises, and practical work, students should acquire appropriate knowledge and experience for practical application in road traffic, which is a significant and spatially demanding		

	segment of the urban traffic system. The course "Planning and Capacity of Road Traffic Networks" is designed to ensure the required level of knowledge on the rules, methods, and procedures for planning and designing free road sections, traffic intersections, and the road network within a suitable spatial scope. The course also provides the knowledge and skills necessary for proper control and management in road traffic.
Sustainable Development Goal (SDG):	– SDG 9: Industry, Innovation, and Infrastructure – SDG 11: Sustainable Cities and Communities – SDG 13: Climate Protection
Teaching methods:	Teaching is carried out through lectures, exercises, and practical sessions that include the development of project tasks. Lectures are delivered orally with presentations and practical examples. Discussions on issues related to planning and designing traffic infrastructure will be encouraged. Students will be required to prepare and present seminar papers and/or project tasks. Various teaching methods will be used, including oral presentations, discussions, demonstration of examples, graphical and video presentations, and group work with appropriate methodological approaches.
Assessment methods with grading structure:	Evaluation criteria and grading during the course are as follows: Attendance at lectures and exercises will be recorded; attendance is mandatory as a condition for taking the exam, with a maximum of 20% unexcused absences allowed. Regular attendance will not be awarded additional points. Homework/seminar paper/practical work is graded from 0 to 15 points, and only students who fulfill over 50% of these requirements will be evaluated. During the course, only one knowledge check will be organized – a partial exam in the 7th or 8th week of classes, worth 35 points, and only students who pass over 50% of this partial exam will be graded. The final exam is worth up to 50 points.
Literature:	Mandatory: 1. Kuzović, Lj.: "Capacity and Level of Service of Road Networks", University of Belgrade, 2000. 2. Kiso, F.: "Capacity of Intersections", University of Sarajevo, Faculty of Traffic and Communications, Sarajevo, 2010. 3. Kuzović, Lj.: "Determining the Need and Justification for Diverting Transit Traffic from Urban Arterials by Building Bypasses", University of Belgrade, 1997. 4. Kuzović, Lj.: "Evaluation in the Management of Road Network Development and Operation", University of Belgrade, 1994. 5. Highway Capacity Manual - HCM, 2000. 6. Tubić, V.: "Collection of Solved Tasks from Road Capacity and Level of Service", University of Belgrade, 2000. 7. Vukanović, S.: "Roundabouts", University of Belgrade, Faculty of Traffic, 1994. 8. Kiso, F., Deljanin, A.: "Methods of Evaluation in the Planning and Design of Traffic Infrastructure", University of Sarajevo, 2017.

Course code: **11TRTOS020203**	**Course title:** **EVALUATION AND DECISION METHODS IN TRAFFIC DESIGN**		
Level: II	**Year: II**	**Semester: III**	**Number of ECTS credits: 6**
Status: Mandatory + Elective Course		**Total number of contact hours: 90** Lectures: 45 Exercises: 30 Seminar: 15	

Course participants:	**Academic staff and associates selected in the field to which the course belongs/course**
Prerequisite for enrollment:	None
Course goal (goals):	The course content aims to familiarize students with the fundamentals of planning and designing traffic infrastructure and types of evaluation in the planning and design process. The course also studies the most significant and commonly applied evaluation methods in traffic planning and design. The course material includes investment, environmental, and socio-economic evaluation methods and multi-criteria analysis methods with practical examples and guidelines for understanding the decision-making process in traffic engineering.
Topics covered (Units of study): *(if necessary, the weekly implementation plan is established taking into account the specificities of organizational units)*	1. Traffic system as a factor of spatial organization and distribution 2. Methodological approach to traffic planning 3. Basics of traffic route planning 4. Basics of traffic route design 5. Theoretical assumptions of traffic infrastructure planning and design 6. Feasibility Study – CB analysis 7. Functional evaluation of project solutions 8. Functional evaluation of road sections 9. Financial and economic project analysis 10. Cost-benefit analysis in traffic projects 11. Multi-criteria evaluation and decision-making methods 12. Environmental impact assessment of infrastructure 13. Traffic infrastructure project management 14. Project management techniques 15. Preparation of projects financed by EU funds
Learning outcomes:	Through lectures, exercises, and practical work, students should acquire the necessary knowledge and experience for practical application in traffic infrastructure planning and design. The course also enables the acquisition of knowledge and skills required for evaluating planning and design solutions and making appropriate decisions based on that evaluation.
Sustainable Development Goal (SDG):	– SDG 8: Decent Work and Economic Growth – SDG 9: Industry, Innovation, and Infrastructure – SDG 11: Sustainable Cities and Communities – SDG 13: Climate Action – SDG 17: Partnerships for the Goals
Teaching methods:	Teaching is conducted through lectures, exercises, and practical parts that include project assignments. Lectures are delivered through oral presentations with examples from practice. Discussions on issues in traffic infrastructure planning and design are encouraged. Students are required to complete and present seminar papers and/or project assignments. Various methods are used, including oral presentations and discussions, demonstrations, graphical and video presentations, and group work using appropriate methodological approaches.
Assessment methods with grading structure:	Evaluation criteria for student performance are as follows: Attendance in lectures and exercises will be recorded, with attendance being mandatory as a condition for taking the exam, with a maximum of 10% unexcused absences allowed. Regular attendance will not be additionally rewarded. The signature is not conditional on attendance. Homework/seminar paper/practical work: 0 to 15 points, with grading only for students who meet over 50% of the specified requirements. One

	knowledge check will be organized during the course - a partial exam in the 7th or 8th week with a value of 35 points, with grading only for students who pass over 50% of the partial exam. The final exam is worth a maximum of 50 points.
Literature:	Mandatory: 1. Jovanović, N.: "Traffic Planning", Faculty of Transport Engineering, University of Belgrade, 1990. 2. Kuzović, Lj.: "Evaluation in Management and Development and Exploitation of Road Networks", Faculty of Transport Engineering, University of Belgrade, 1994. 3. Milosavljević, N.: "Elements for Technological Design of Road Traffic and Transport Facilities", University of Belgrade, 1998. 4. Kuzović, Lj.: "Determining the Needs and Justification for Removing Transit Traffic from Urban Arteries by Building Bypasses", University of Belgrade, 1997. 5. Highway Capacity Manual – HCM 1994 / HCM 2000 6. Kiso, F., Deljanin, A.: "Evaluation Methods in Traffic Infrastructure Planning and Design", Faculty of Transport and Communications, University of Sarajevo, 2017.

Course code: 12TRTOS020203	**Course title: ELEMENTS OF ROAD SAFETY**		
Level: II	**Year: II**	**Semester: III**	**Number of ECTS credits: 6**
Status: Mandatory Course		**Total number of contact hours: 90** Optional breakdown of hours by type: Lectures: 30 Tutorials: 30 Seminars: 10 Fieldwork: 10 Laboratory Tutorials: 10	
Course participants:	**Academic staff and associates selected in the field to which the course belongs/course**		
Prerequisite for enrollment:	No		
Course goal (goals):	Acquisition of educational forms in the implementation of programs in the field of road safety elements, as well as practical analyses, reports, and projects in the area of road safety and road infrastructure.		
Topics covered (Units of study): *(if necessary, the weekly implementation plan is established taking into account the specificities of organizational units)*	1. Introduction – Basics of Road Safety Elements 2. Law on Basic Road Traffic Safety in BiH and Regulations 3. Law on Roads and Regulations 4. Road Parameters and Traffic Signage and Road Equipment 5. Types and Content of Projects for Road Construction and Reconstruction 6. Regulations on Basic Conditions that Public Roads, Their Elements, and Structures Must Meet from the Aspect of Traffic Safety; Guidelines; Motorway Instructions Set 7. EU and BiH Standards – Traffic Signage and Equipment 8. Review of Traffic Signage and Road Equipment Projects 9. Technical Acceptance of Roads 10. RSA and RSI – Road Safety Audits and Road Safety Inspections 11. EuroRAP 12. Importance and Capabilities of protective fences on the road in Reducing Vehicle Run-off-road Accidents		

	13. Black Spot Management on the Road Network 14. Black Spot Analysis (Field Research) 15. Traffic Regulation in Construction Zones
Learning outcomes:	Knowledge: Theoretical and practical knowledge in the field of road safety. Basic regulations, rules, methods, and procedures in the field of road safety and road infrastructure. Skills: The ability to apply theoretical and practical knowledge in the field of road safety and road infrastructure for road network management. Competencies: The ability to independently understand and use regulations, utilize professional literature, apply methods and procedures, conduct measurements and research, use software tools, use measuring devices and equipment, and prepare analyses and practical solutions in the process of planning, designing, constructing, supervising, maintaining, and managing the road network and road infrastructure.
Sustainable Development Goal (SDG):	"SDG3 – Good Health and Well-being"; "SDG9 – Industry, Innovation, and Infrastructure"; "SDG11 – Sustainable Cities and Communities"; "SDG12 –Responsible Consumption and Production."
Teaching methods:	Presentation with the demonstration of various methods and processes in the field of road safety using video and audio recordings, and independent presentations of specific issues on roads in a specific research area. Initiating discussions and debates on practical problems, individual observations from different environments, and the development of independent projects in the field of road safety.
Assessment methods with grading structure:	Evaluation of activities in lectures and exercises, along with the preparation of independent work, assessment of the mid-term test during the course, and the final exam. The criteria for monitoring and assessing student performance during the course are as follows: – Seminar/Fieldwork/Lab Exercises/Practice (written and oral assessment) – 15 points (%), passed if over 50% is achieved. – Mid-term exam/test/knowledge check (written assessment) – 35 points (%), passed if over 50% is achieved. – Final exam (Second Mid-term) (written assessment) – 50 points (%), passed if over 50% is achieved. – Final exam (Comprehensive) (written assessment) – 85 points (%), passed if over 50% is achieved. The total number of points (%) a student can achieve through this monitoring system during the course is a maximum of 50 points (%), which combined with the Final (Second Mid-term) totals 100 points (%). For students who did not pass the First Mid-term exam, the Final (Comprehensive) exam is organized covering all the material taught during lectures and exercises and is worth 85 points (%), combined with the seminar/practical work to make a total of 100 points (%). To pass the course, students must pass each of the following parts: the seminar paper, the first mid-term exam (test), and the final exam (second mid-term or comprehensive). The evaluation of the seminar paper and the first mid-term exam (test) is conducted during the course. Students who pass the first mid-term exam only take the second mid-term exam in the final exam, while those who do not pass the first mid-term exam will take the comprehensive final exam, which consists of both the first and second mid-term exams. Students who did not pass the exam in the previous academic year but fulfilled certain obligations and earned points can carry them over to the

	current academic year. Students who wish to carry over points must inform the course instructor at the start of the semester, by the end of the first week of lectures. Points may be carried over only once. The final student grade after all forms of knowledge assessment will be evaluated and graded according to the following system: a) 10 (A) – exceptional performance with no or minimal errors, 95-100 points; b) 9 (B) – above average, with some errors, 85-94 points; c) 8 (C) – average, with noticeable errors, 75-84 points; d) 7 (D) – generally good, but with significant deficiencies, 65-74 points; e) 6 (E) – meets minimum requirements, 55-64 points; f) 5 (F, FX) – does not meet minimum requirements, less than 55 points. The total assessment of all student obligations during the semester, i.e., the exam grade, is based on the total number of points (%) the student has achieved by fulfilling pre-exam obligations and passing the mid-term and final exams. This totals a maximum of 100 points, and is determined according to the following scale: Student Obligations Points (%) Attendance in lectures and exercises ……..... 0 points Minimum 80% attendance at all forms of classes is mandatory, and this is a condition for course certification/signing off on proper attendance. Seminar Paper/Fieldwork/Lab Exercises/Practice (written and oral assessment).....15 points (%) First Mid-term Exam (written).....35 points (%) Final Exam (Second Mid-term) (written).....50 points (%) Final Exam (Comprehensive) (written).....85 points (%)
Literature:	Mandatory: 1. Lindov, O.: Road Traffic Safety, University Book, Faculty of Traffic and Communications, Sarajevo, 2008. 2. Lindov, O., Omerhodžić, A.: Elements of Road Safety. Lecture Notes, Faculty of Traffic and Communications, Sarajevo, 2015. 3. Lindov, O., Kalajdžić, E., Omerbegović, H.: Professional and Legal Aspects of Design - Traffic Area - Professional Examination - Road Traffic - Traffic and Communications Engineers Association of Bosnia and Herzegovina, Sarajevo, BiH, 2013. 4. Lindov, O.: Manual for Strengthening Capacity in the Traffic Safety Profession, Faculty of Traffic and Communications, University of Sarajevo, Erasmus+ Trafsaf Project, Sarajevo, 2020. 5. Directive 2008/96/EC of the European Parliament and Council of November 19, 2008, on Road Infrastructure Safety Management. 6. Road Safety Audit Manual for SEETO Member States. 7. Road Safety Inspection Manual for SEETO Member States. 8. Guidelines for the Design, Construction, Maintenance, and Supervision of Roads, Sarajevo, Banja Luka, 2005. 9. ZOOBS, regulations, standards, Ministry of Communications and Transport, BiH. 10. Zdravković, P., Stanić, B., Vukanović, S., Milosavljević, S.: Elements of Traffic Design: Vertical Signage, Traffic Faculty, University of Belgrade, Belgrade, 2003. 11. Zdravković, P., Stanić, B., Vukanović, S., Milosavljević, S.: Elements of Traffic Design: Horizontal Signage, Traffic Faculty, University of Belgrade, Belgrade, 2003. Supplementary: 1. Milojčić, D., Jovanov, D., Lipovac, Krsto, Branković, R.: Initial Experiences with the Application of RSA (Road Safety Audit) in

	Serbia - Case Study, Proceedings, Sarajevo, 2008. 2. Elvik, R.: Road Safety Inspections and Best Practice Guidelines, Oslo, 2006. 3. Lindov, O.: Transport and Environment, Faculty of Traffic and Communications, University book, Sarajevo, 2011. 4. Regional Road Safety Strategy (RRSS) for SEETO Member States. 5. Road Safety Audit Guidelines, NRA National Roads Authority, Dublin, 2004. 6. Safety Audit Procedures for Existing Roads, Transfund New Zealand, Wellington, 1998. 7. Morgan, R., J. Epstein, P. Jordan, G. Lee, and R. Lathlean: Road Safety Audit Guide.

Course code: **09-10-1TRTES020102**	**Course title** **MANAGEMENT AND ORGANIZATION OF STATIONARY TRAFFIC**		
Level: II	**Year: I**	**Semester: II**	**Number of ECTS credites: 6**
Status: Elective Course		**Total number of contact hours: 150** Optional breakdown of hours by type: Lectures 45 Tutorials 30 Laboratory tutorials 15	
Course participants:	**Academic staff and associates selected in the field to which the course belongs/course**		
Prerequisite for enrollment:	No		
Course goal (goals):	Acquistion of educational forms for implementing programs in stationary traffic management and organization systems, as well as practical analyses, reports, and projects in the field of stationary traffic.		
Topics covered (Units of study): *(if necessary, the weekly implementation plan is established taking into account the specificities of organizational units)*	1. Introduction – Basic Concepts in the field of Stationary Traffic 2. Spatial and Urban Planning and Stationary Traffic 3. Development of Stationary Traffic and the Emergence of Parking Needs 4. Elements of Parking. Parking Lot Elements 5. Physical Characteristics of Parking Lots and Technological Requirements of the Organization System 6. Planning and Types of Research on Parking Space Needs 7. Capacity of Stationary Traffic 8. Basic Phases and Elements of Project Documentation for Parking Lots and Parking Garages 9. Control, Management, and Organization of Stationary Traffic 10. Horizontal and Vertical Signage in Stationary Traffic 11. Traffic Policy Measures and Economic Aspects of Stationary Traffic 12. Urban Parking and Traffic Violation Policy – Legal Regulations 13. Software Solutions for Parking Management 14. Public-Private Partnership, Opportunities, and Threats in		

	Stationary Traffic 15. Impact of Parking Systems on Optimizing the Human Environment
Learning outcomes:	Through lectures, tutorials and practical work, students should acquire the necessary knowledge and experience for practical application in stationary traffic, with a focus on parking lot elements and road terminals. The course material should ensure a level of knowledge regarding the rules, methods, and standards in stationary traffic. The course enables the acquisition of the knowledge and skills necessary for adequate analysis, assessment, and management of stationary traffic from both an economic and safety perspective.
Sustainable Development Goal (SDG):	– SDG9: Build Resilient Infrastructure, Promote Inclusive and Sustainable Industrialization, and Foster Innovation – SDG11: Make Cities and Human Settlements Inclusive, Safe, Resilient, and Sustainable – SDG13: Take Urgent Action to Combat Climate Change and its impacts
Teaching methods:	Lectures, tutorials and preparation of seminars with a practical focus.
Assessment methods with grading structure:	Evaluation and grading of students during the course are carried out as follows: – Attendance at lectures and exercises: 0 – 10 points (%) – Homework/seminar papers/practical work: 0 – 10 points (%) – First partial exam/test/knowledge check: 0 – 15 points (%) – Second partial exam/test/knowledge check: 0 – 20 points (%) The total number of points (%) that a student can achieve based on the above criteria during the course is a maximum of 55 points (%). The final exam is worth up to 45 points or 45 (%). The final exam covers the entire material studied during the course.
Literature:	Mandatory: 1. Brčić, D.; Šoštarić, M.Parkiranje i garaže, Fakultet prometnih znanosti, Zagreb 2012. 2. Tomić, Milovan, 1995, Parkiranje i parkirališta – Stacionarni saobraćaj, Sao Basic assumptions for the development and concept of 3. braćajni fakultet univerziteta u Beogradu. 4. Putnik, Nikola, 2001, Autobaze i autostanice, Saobraćajni fakultet univerziteta u Beogradu 5. Mehanović, Mustafa, Planiranje ponude usluga u gradskom prometu putnika, Fakultet za saobraćaj i komunikacije, Sarajevo, 2011. Supplementary: 1. Studija saobraćaja na području Kantona Sarajevo – Mirujući saobraćaj, Fakultet za saobraćaj i komunikacije Sarajevo, 2005.

Course code: **09-10-2TRTES020102**	**Course title:** **ELEMENTS OF ROAD VEHICLE SAFETY**		
Level: II	**Year: I**	**Semester: II**	**Number of ECTS credits: 6**
Status: Elective course		**Total number of contact hours: 90** Lectures 45 Exercises 30	

	Seminar 15
Course participants:	**Academic staff and associates selected in the field to which the course belongs/course**
Prerequisite for enrollment:	No
Course goal (goals):	Acquiring basic knowledge physical concepts about behavior vehicles on pavement , construction , function and tasks classical active and passive road vehicle safety elements as well as intelligent transport systems ITS (*eng. Intelligent Transport Systems*) that are installed in vehicles, with the aim of improving the active and passive safety of vehicles. Getting to know the legal regulations related to the installation, maintenance and homologation of these systems and devices. Acquiring knowledge about procedures and methods for determining the speed of vehicles.
Topics covered (Units of study): *(if necessary, the weekly implementation plan is established taking into account the specificities of organizational units)*	1. Introduction - basics of road vehicle safety elements. Vehicle classification. Elements of active vehicle safety 2. Physical terms about vehicle behavior on the roadway – dynamic characteristics (maximum traction and braking forces) 3. Physical terms about the behavior of vehicles on the roadway - longitudinal stability of the vehicle. Elements of vehicle movement and stopping 4. Physical terms about the behavior of vehicles on the road - transverse stability of the vehicle. Tires and safety of movement 5. Ensuring the stability and controllability of the vehicle during the braking process - Anti-lock brake system on the vehicle 6. -slip system of the driving wheels (ASR). Electronic vehicle stability control (ESP) 7. Systems for vehicle detection, partial vehicle control and driver support 8. Ergonomic parameters of road vehicles (construction of the driver's workplace, noise and vibrations) 9. Vehicle speedometers 10. Body Crash test and vehicle safety 11. Seat belts and head restraints and safety 12. Air bags and vehicle safety 13. Car seat and safety of road vehicles 14. Elements of motor vehicles and damage assessment 15. Final considerations-Revision and preparation for the exam
Learning outcomes:	Knowledge: Knowledge of the basic elements of active and passive vehicle safety and new technologies and devices that are installed on the vehicle in order to improve vehicle safety. Knowledge of legal regulations (regulations, UNECE regulations , - EU Directives , BAS and ISO standards) related to the installation, maintenance and homologation of these systems and devices. Skills: Ability to evaluate and check the condition of active and passive systems and devices on the vehicle. The ability to recognize the basic characteristics of scientific research . Ability to communicate conclusions and the reasons that led to them. Competencies: Through educational process lectures , exercises and seminar student will to be able , at basis adopted knowledge that quality leads , supervises and solves problems in cells for technical reviews vehicles , to perform jobs bound for homologation vehicles , participates in the production rulebook bound for safety vehicles and others jobs

	bound for safety vehicles .
Sustainable Development Goal (SDG):	SDG3 – Good health and wellbeing; SDG11 – Sustainable cities and communities
Teaching methods:	– Independent presentation – Discussion – Analysis of examples from practice (assignments, seminar papers)
Assessment methods with grading structure:	Assessment of creativity in classes and exercises with the creation of independent works, assessment of the partial test during the class as well as the assessment of the final exam. Criterion monitoring the work and evaluating the student during classes, according to the following method: – Homework/seminar work/practical work/ 15 points (%), passed if over 55% is won. – I Partial exam/test/knowledge check/35 points (%), passed if more than 55% is won. – Final exam (II Partial) 50 points (%), passed if over 55% is won. – Final exam (Integral) 85 points (%), passed if more than 55% is won. The total number of points (%) that a student can achieve according to the mentioned monitoring during classes is a maximum of 50 points (%), which with the Final (II partial) makes 100 points (%). For students who did not pass the 1st Partial exam, the Final exam (Integral) is organized from the entire material covered during classes and exercises, and is evaluated with 85 points (%), which with the seminar work/practical work makes 100 points (%). The final success of the student, after all the foreseen forms of knowledge testing, is evaluated and graded by the grading system as follows: a) 10 (A) - exceptional success without errors or with minor errors, carries 95-100 points; b) 9 (B) - above average, with some errors, carries 85-94 points; c) 8 (C) - average, with noticeable errors, carries 75-84 points; d) 7 (D) - generally good, but with significant shortcomings, carries 65-74 points; e) 6 (E) - meets the minimum requirements, carries 55-64 points; f) 5 (F, FX) - does not meet the minimum requirements, less than 55 points. The total evaluation of all the student's obligations during the semester, i.e. the grade on the exam, is based on the total number of points (%) that the student earned by fulfilling pre-exam obligations and passing the partial and final exam, and according to the quality of acquired knowledge and skills, and contains a maximum of 100 points, and is determined according to the following scale: Student obligations _____Points (%) Attendance at lectures and exercises.....80 (%) Assignment/Seminar/Practice/.....15 points (%) I Partial exam/Test/Knowledge check/.....35 points (%) Final exam (II Partial) .....50 points (%) Final exam (Integral) .....85 points (%)
Literature:	Mandatory: 1. Lindov , O.: Safety in road traffic, University textbook, Faculty of Traffic and Communications, Sarajevo, 2008. 2. Lindov , O.: Transport and environment, University textbook, Faculty of Traffic and Communications, Sarajevo, 2011. 3. Lindov , O.: Expertise of traffic accidents, Faculty of Traffic and Communications, Sarajevo, 1998-2006,

	4. Lindov , O. Dacić S.: Elements of road vehicle safety, Lecture notes, Faculty of Traffic and Communications, Sarajevo, 2012. 5. Lindov , O.Dacić S.: Elements of road vehicle safety, Script of exercises and tests, Faculty of Traffic and Communications, Sarajevo, 2012. Supplementary: 1. Dragač R.: Road Traffic Safety - Book III, Faculty of Traffic, Belgrade 1994; 2. Čović M., Zečević D., Expertise in road traffic, Informator, Zagreb, 1987; 3. Golubić J.: Fundamentals of Traffic Safety Techniques, Faculty of Traffic Sciences, Zagreb, 1992; 4. Rajamani, R.: Vehicle Dynamics and Control , University of Minnesota , USA, 2006; 5. Kiencke , U. Nielsen L.: Automative Control System, Universität Karlsruhe (TH) Department of Electrical Engineering , 2005

Course code: **09-10-3TRTES020102**	**Course title:** **PROTECTION IN TRAFFIC AND TRANSPORT**		
Level: II	**Year: I**	**Semester: II**	**Number of ECTS credits: 6**
Status: Elective Course		**Total number of contact hours: 90** Optional breakdown of hours by type: Lectures: 30 Tutorials: 30 Seminars: 10 Fieldwork: 10 Laboratory Tutorials: 10	
Course participants:	**Academic staff and associates selected in the field to which the course belongs/course**		
Prerequisite for enrollment:	No		
Course goal (goals):	Acquisition of educational knowledge in the implementation of programs related to traffic and transport safety, as well as practical analysis, reports, expert evaluations, and preventive measures for road safety.		
Topics covered (Units of study): *(if necessary, the weekly implementation plan is established taking into account the specificities of organizational units)*	1. Introduction – Basics of Traffic and Transport Safety 2. Traffic Safety Strategy in Bosnia and Herzegovina 3. EU Projects and Increasing Road Safety 4. Road Inventory, Roadway, Traffic Signage, and Road Equipment (Road Categorization, Road Cadastre) 5. Authorities, Responsibilities, and Obligations of Road Managers Regarding Road Protection, Maintenance, and Safety Contracts 6. Protective Aspects of Regular and Emergency Road Maintenance 7. Management of Black Spots 8. Protection of Roadway (Regulating Construction and Installation of Structures, Bus Stops, Gas Stations, Junctions, Installations, Billboards, etc.) 9. Protection of Roads from Overloading and Excessive Weight and Axle Loads 10. Management and Protection in Tunnels 11. Management and Protection in Schools Zones 12. Management and Protection in Construction Zones 13. Management and Protection at Road-Railway Crossings		

	14. Oversight of Road Maintenance 15. Final Considerations
Learning outcomes:	Knowledge: Theoretical and practical knowledge in the field of traffic and transport safety. Basic regulations, rules, methods, and procedures in traffic and transport safety. Skills: Ability to apply theoretical and practical knowledge in traffic and transport safety for the development, maintenance, and management of an efficient traffic system. Competencies: Ability to independently understand and use regulations, professional literature, software tools, measurement devices and equipment, methods and procedures, conduct measurements and research, prepare analyses, assess risks, and develop practical solutions within the framework of preventive action and safety in traffic and transport.
Sustainable Development Goal (SDG):	"SDG3 – Good Health and Well-being"; "SDG9 – Industry, Innovation, and Infrastructure"; "SDG11 – Sustainable Cities and Communities".
Teaching methods:	Presenting various methods, procedures, and processes in traffic and transport safety using video and audio recordings, and independently presenting specific research and application of methods and procedures in the field of traffic and transport safety. Initiating discussions and debates on practical issues, individual observations from different environments, and the preparation of independent projects and research in the field of traffic and transport safety.
Assessment methods with grading structure:	Evaluation of activities in lectures and exercises, along with the preparation of independent work, assessment of the mid-term test during the course, and the final exam. The criteria for monitoring and assessing student performance during the course are as follows: – Seminar/Fieldwork/Lab Exercises/Practice (written and oral assessment) – 15 points (%), passed if over 50% is achieved. – Mid-term exam/test/knowledge check (written assessment) – 35 points (%), passed if over 50% is achieved. – Final exam (Second Mid-term) (written assessment) – 50 points (%), passed if over 50% is achieved. – Final exam (Comprehensive) (written assessment) – 85 points (%), passed if over 50% is achieved. The total number of points (%) a student can achieve through this monitoring system during the course is a maximum of 50 points (%), which combined with the Final (Second Mid-term) totals 100 points (%). For students who did not pass the First Mid-term exam, the Final (Comprehensive) exam is organized covering all the material taught during lectures and exercises and is worth 85 points (%), combined with the seminar/practical work to make a total of 100 points (%). To pass the course, students must pass each of the following parts: the seminar paper, the first mid-term exam (test), and the final exam (second mid-term or comprehensive). The evaluation of the seminar paper and the first mid-term exam (test) is conducted during the course. Students who pass the first mid-term exam only take the second mid-term exam in the final exam, while those who do not pass the first mid-term exam will take the comprehensive final exam, which consists of both the first and second mid-term exams. Students who did not pass the exam in the previous academic year but fulfilled certain obligations and earned points can carry them over to the current academic year. Students who wish to carry over points must inform the course instructor at the start of the semester, by the end of the

	first week of lectures. Points may be carried over only once. The final student grade after all forms of knowledge assessment will be evaluated and graded according to the following system: a) 10 (A) – exceptional performance with no or minimal errors, 95-100 points; b) 9 (B) – above average, with some errors, 85-94 points; c) 8 (C) – average, with noticeable errors, 75-84 points; d) 7 (D) – generally good, but with significant deficiencies, 65-74 points; e) 6 (E) – meets minimum requirements, 55-64 points; f) 5 (F, FX) – does not meet minimum requirements, less than 55 points. The total assessment of all student obligations during the semester, i.e., the exam grade, is based on the total number of points (%) the student has achieved by fulfilling pre-exam obligations and passing the mid-term and final exams. This totals a maximum of 100 points, and is determined according to the following scale: Student Obligations Points (%) Attendance in lectures and exercises ……..... 0 points Minimum 80% attendance at all forms of classes is mandatory, and this is a condition for course certification/signing off on proper attendance. Seminar Paper/Fieldwork/Lab Exercises/Practice (written and oral assessment).....15 points (%) First Mid-term Exam (written).....35 points (%) Final Exam (Second Mid-term) (written).....50 points (%) Final Exam (Comprehensive) (written).....85 points (%)
Literature:	Mandatory: 1. Lindov, O.: "Protection in Traffic and Transport" Lecture Notes, Faculty of Traffic and Communication, University of Sarajevo, 2017. 2. Lindov, O.: " Protection in Traffic and Transport" Exercise and Test Notes, Faculty of Traffic and Communication, University of Sarajevo, 2017. 3. Lindov, O.: Road Traffic Safety, Faculty of Traffic and Communications, Sarajevo, 2007. 4. Lindov, O., Manual for Strengthening the Capacity of the Traffic Safety Profession, Faculty of Traffic and Communications, University of Sarajevo, Erasmus+ Project Trafsaf, Sarajevo, 2020. 5. Perić, T., Ivaković, Č.: Protection in Traffic Process, Faculty of Traffic Sciences, Zagreb, 1996. 6. Rotim, F.: Elements of Road Traffic Safety - Traffic Accident Expertise, Zagreb, 1990. Supplementary: 1. Pavišić, B.: Methodology of Traffic Crime Research, Faculty of Criminalistics, Zagreb, 1993. 2. Beširević, S.: Railway Traffic Technology, Faculty of Traffic and Communications, Sarajevo, 1998. 3. Directive 2008/96/EC of the European Parliament and Council of 19 November 2008 on Road Infrastructure Safety Management. 4. ETSC RSA Handbook, Brussels, 1997. 5. Golubić, J.: Basics of Traffic Technique and Safety, Faculty of Traffic Sciences, Zagreb, 1992. 6. Kostić, S.: Traffic Safety and Control Techniques, FTN, Novi Sad, 2002. 7. Lindov, O.: Traffic Accident Expertise, Faculty of Traffic and Communications, Sarajevo, 1998-2006. 8. Regional Road Safety Strategy (RRSS) for SEETO Members.

Course code: **09-10-4TRTES020102**	**Course title:** **TECHNOLOGICAL ANALYSIS OF ROAD TRAFFIC**		
Level: II	**Year: I**	**Semester: II**	**Number of ECTS credites: 6**
Status: Elective Course		**Total number of contact hours: 105** Optional breakdown of hours by type: Lectures 30 Tutorials 30 Seminars 15 Independent work 30	

Course participants:	**Academic staff and associates selected in the field to which the course belongs/course**
Prerequisite for enrollment:	No
Course goal (goals):	Acquisition of educational forms in the implementation of programs related to technological analysis of road transport. Gaining knowledge and skills in technological analysis of road transport.
Topics covered (Units of study): *(if necessary, the weekly implementation plan is established taking into account the specificities of organizational units)*	1. Basics of Technological Process Analysis in Passenger and Freight Transport 2. Technology and Organization Structure in Road Transport 3. Characteristics of Transport Demands in Road Transport 4. Characteristics of Transport Supply in Road Transport 5. Fundamentals of Technological Processes in Passenger and Freight Transport 6. Measurement of Technological Processes in Road Transport 7. Analysis of Transport Processes in Road Transport 8. Design and Management of Processes in Road Transport 9. New Technologies in the Analysis of Technological Processes in Road Transport
Learning outcomes:	Through lectures, tutorials and practical work, students should acquire the necessary knowledge related to the analysis of processes in road transport of goods and passengers. Study and practical application should ensure that students achieve the required level of knowledge to successfully perform the analysis of technological processes and performance indicators in passenger and freight transport.
Sustainable Development Goal (SDG):	– SDG4: Ensure inclusive and quality education, and promote lifelong learning opportunities for all people, of all ages – SDG9: Industry, Innovation, and Infrastructure – SDG11: Sustainable Cities and Communities – SDG12: Responsible Consumption and Production – SDG13: Climate Action
Teaching methods:	Lectures, tutorials and preparation of seminars with a practical focus. Analytical and demonstrative approach.
Assessment methods with grading structure:	Student performance is monitored by assigning points for each form of activity and knowledge assessment during the semester, as well as on the final exam after the end of the semester according to the following monitoring elements: – Homework/Seminar Paper/Practical Work: 15 points (%), evaluated if more than 50% is achieved – First Partial Exam/First Test/First Knowledge Check: 35 points

	(%), evaluated if more than 50% is achieved – Final Exam (Second Partial): 50 points (%), evaluated if more than 50% is achieved – Final Exam (Comprehensive): 85 points (%), evaluated if more than 50% is achieved The total number of points (%) that a student can achieve through the aforementioned monitoring during classes is a maximum of 50 points (%), which, combined with the Final (Second Partial) Exam, totals 100 points (%). For students who did not pass the First Partial Exam, the Final Exam (Comprehensive) covers all the material covered during classes and exercises and is worth 85 points (%), which, combined with the seminar paper/practical work, totals 100 points (%). The final success of students after all the prescribed forms of knowledge assessment is evaluated and graded according to the following grading system: a) 10 (A) - Outstanding performance with no errors or only minor errors, earns 95-100 points b) 9 (B) - Above average, with some errors, earns 85-94.99 points c) 8 (C) - Average, with noticeable errors, earns 75-84.99 points d) 7 (D) - Generally good, but with significant shortcomings, earns 65-74.99 points e) 6 (E) - Meets the minimum requirements, earns 55-64.99 points f) 5 (F, FX) - Does not meet the minimum requirements, less than 55 points.
Literature:	Mandatory: 1. Topenčarević, Lj.: Organizacija i tehnologija drumskog transporta, Građevinska knjiga, Beograd, 1987.g. 2. Županović, I.: Tehnologija cestovnog prijevoza, Fakultet prometnih znanosti, Zagreb, 2002.g. Supplementary: 1. Mehanović, M., 2017. „Planiranje u saobraćaju, prevozu i komunikacijama “. Fakultet za saobraćaj i komunikacije u Sarajevu, Sarajevo. 2. Mehanović, M., 2011. „Planiranje ponude usluga u gradskom prometu putnika“. Fakultet za saobraćaj i komunikacije u Sarajevu, Sarajevo. 3. Mehanović, M.: “Zadaci i primjeri iz teorije i prakse u javnom gradskom prevozu putnika”, Fakultet za saobraćaj i komunikacije, Sarajevo, 2005. 4. Oblak, H. i Mulej, M.: Organiziranje poslovanja prometnih podjetij, Univerza v Mariboru, Maribor, 1998.g. 5. Uzelac, J.: Kibernetizacija poslovanja, Ekonomski fakultet Rijeka, 1994.g. 6. Zelenika, R.; Jakomin, L.: Suvremeni transportni sistemi, Ekonomski fakultet sveučilišta u Rijeci, Rijeka, 1995.g.

Course code: **09-10-5TRTES020102**	**Course title:** **OPTIMIZATION AND MANAGEMENT OF VEHICLE FLEETS**		
Level: II	**Year: I**	**Semester: II**	**Number of ECTS credits: 6**
Status: Mandatory Course		**Total number of contact hours: 90** Optional breakdown of hours by type: Lectures 30 Tutorials 20	

	Seminars 10 Fieldwork 10 Laboratory Tutorials 10 Practice 10
Course participants:	**Academic staff and associates selected in the field to which the course belongs/course**
Prerequisite for enrollment:	None
Course goal (goals):	Acquisition of educational forms necessary for transport and economic evaluation in the field of optimization, exploitation and fleet management. Also, getting to know and acquiring the necessary knowledge for the optimization, exploitation and management of the vehicle fleet in domestic and international road transport of passengers and freight. This is based on scientific, practical and realistic market principles. Work with software designed for fleet management.
Topics covered (Units of study): *(if necessary, the weekly implementation plan is established taking into account the specificities of organizational units)*	1. Introduction – Basics of Fleet Optimization and Management 2. Single European Transport Area 3. The concept and meaning of fleet optimization 4. The Concept and Meaning of Fleet Exploitation 5. Regulation of transport services in domestic and international transport 6. Characteristics and division of the vehicle fleet 7. Selection, models of financing the purchase and write-off of vehicles 8. Models of organization and management of the vehicle fleet 9. Transport processes and elements of fleet operation 10. Transport Cost Analysis 11. Measuring the performance of fleet and staff 12. Application of software for selection of transport route and formation of transport price 13. Professional development of employees in a transport company 14. Fleet Management – A New Trend in Fleet Management 15. Concluding Considerations on Fleet Optimization and Management
Learning outcomes:	Knowledge: Theoretical relevant knowledge and experience for practical application in the field of optimization, exploitation and management of vehicle fleets. Through the subject matter, students will be trained: to conduct a multi-criteria analysis for the selection of the optimal model of fleet management and exploitation; to plan the costs of transport and operation of the vehicle fleet and staff; To plan the management of the vehicle fleet in domestic and international transport; to make investments. Skills: Ability to apply theoretical and practical knowledge necessary for adequate analysis, exploitation, optimization and management of the vehicle fleet. Competencies: Ability to independently understand and use regulations, use professional literature, apply methods and procedures, measure and research, make analyses, assessments and practical solutions, take preventive action, and procedures necessary for adequate analysis, optimization and management of the vehicle fleet.
Sustainable Development Goal (SDG):	– SDG4 – Quality Education – SDG5 - Gender Equality – SDG8 - Decent Work and Economic Growth – SDG9- Industry, Innovation and Infrastructure – SDG11 - Sustainable Cities and Local Communities – SDG12-Sustainable consumption and production – SDG13-Climate Action

<table>
<tr><td></td><td>– SDG17- Partnerships for the Goals</td></tr>
<tr><td>Teaching methods:</td><td>Oral presentation with presentation and presentation of various analyses, studies, models and methods in the field of optimization and fleet management with the use of video and audio recordings, software, measuring equipment, and independent presentation of individual specific research. Initiating discussions and discussions on practical problems, individual observations from different environments, making independent analyses, research, measurements and modelling in the field of optimization and fleet management.</td></tr>
<tr><td>Assessment methods with grading structure:</td><td>Assessment of creativity in classes and exercises with the preparation of independent papers, evaluation of the partial test during the class as well as the evaluation of the final exam. The criterion for monitoring the work and evaluation of the student during the course is as follows:
– Seminar 15 points (%), passed if won over 50%.
– I Partial exam/test/knowledge test/35 points (%), is passed if more than 50% is scored.
– Final exam (II Partial) 50 points (%), passed if won over 50%.
– Final exam (Integral) 85 points (%), passed if won over 50%.
The total number of points (%) that a student can achieve during the course is a maximum of 50 points (%), which together with the Final (II partial) makes 100 points (%). For students who have not passed the I Partial Exam, the Final Exam (Integral) is organized from the entire material covered during classes and exercises, and is evaluated with 85 points (%), which with the seminar paper/practical work makes 100 points (%).
The final success of the student after all the foreseen forms of examination is evaluated and evaluated by the grading system as follows: a) 10 (A) - exceptional success without errors or with minor errors, carries 95-100 points; b) 9 (B) - above average, with some error, carries 85-94 points; c) 8 (C) - average, with noticeable errors, carries 75-84 points; d) 7 (D) - generally good, but with more significant drawbacks, carries 65-74 points; e) 6 (E) - meets the minimum requirements, carries 55-64 points; f) 5 (F, FX) - does not meet the minimum requirements, less than 55 points.
The total evaluation of all student obligations during the semester, i.e. the grade on the exam, is based on the total number of points (%) that the student has acquired by fulfilling the pre-exam obligations and passing the partial and final exam, according to the quality of the acquired knowledge and skills, and contains a maximum of 100 points, and is determined according to the following scale:

<table>
<tr><td>The Student's Responsibilities</td><td>Score (%)</td></tr>
<tr><td>Attendance at lectures and exercises
(attendance at all forms of teaching is mandatory at least 80% and this is a condition for the certification/signature of regular attendance)</td><td>0 points</td></tr>
<tr><td>Seminar</td><td>15 points (%)</td></tr>
<tr><td>I Partial Exam / Test / Knowledge Assessment /</td><td>35 points (%)</td></tr>
<tr><td>Final exam (II partial)</td><td>50 points (%)</td></tr>
<tr><td>Final exam (Integral)</td><td>85 points (%)</td></tr>
</table>
</td></tr>
<tr><td>Literature:</td><td>Mandatory:
1. Kiso A. Fahrudin, Eksploatacioni troškovi u cestovnom saobraćaju (skripta), Sarajevo, 1994.
2. Lindov O., Džaferović S., Tehnologija cestovnog transporta (skripta</td></tr>
</table>

	predavanja), Fakultet za saobraćaj i komunikacije Sarajevo, 2013. 3. Topenčarević, Lj., Organizacija i tehnologija cestovnog transporta, IRO "Građevinska knjiga", Beograd, 1987. 4. Vešović, V., Bojanić, N., Organizacija saobraćajnih preduzeća, Beograd, 2002. 5. Zelenika, R., Prometni sustavi, Ekonomski fakultet u Rijeci, 2001. 6. Županović, I., Ribarić, B., Organizacija i praćenje učinka cestovnih prijevoznih sredstava, Fakultet prometnih znanosti Zagreb, 1983. 7. Županović, I., Tehnologija cestovnog prijevoza, Fakultet prometnih znanosti Zagreb, 1994. 8. Lindov O., Džaferović S., Tehnologija cestovnog transporta (skripta zadataka, testovi za polaganje), Fakultet za saobraćaj i komunikacije Sarajevo, 2013. Supplementary: 1. Grbo, A., Komercijalna podjela GPS uređaja, časopis "Zaštita", broj 4, juli/avgust 2006. 2. Lindov, O., Tehnologija drumskog transporta (skripta zadataka), Fakultet za saobraćaj i komunikacije Sarajevo, 2007. 3. NEA Cost (Računanje troškova u Cestovnom transportu), FSK, 2000.

Course code: **09-10-6TRTES020102**	**Course title:** **STANDARDIZATION IN ROAD TRAFFIC**		
Level: II	**Year: I**	**Semester: II**	**Number of ECTS credits: 6**
Status: Mandatory Course		**Total number of contact hours: 45 + 45** Optional breakdown of hours by type: 3 L + 2 T + 1 P	
Course participants:	**Academic staff and associates selected in the field to which the course belongs/course**		
Prerequisite for enrollment:	Attendance and activity at lectures and exercises, as well as preparation of a project assignment, are mandatory.		
Course goal (goals):	Acquaintance of students with general terms about standards and standardization, adopted definitions, types and typical structure of standards, and the growing importance of the use of standards in all areas of human activity, with special reference to railway traffic.		
Topics covered (Units of study): *(if necessary, the weekly implementation plan is established taking into account the specificities of organizational units)*	1. Basics of modern standardization. Levels of standardization. International, European and national organizations for standardization 2. National BAS standards. Marking and dating of BAS standards. Methods of downloading international and European standards; 3. Overview of BAS technical committees. Corresponding international and European technical committees. 4. ICS classification. Areas, groups and subgroups. Areas, groups and subgroups related to road traffic 5. Areas of work of BAS technical committees related to road traffic and corresponding international/European TC 6. Basic division of standards with examples of generic and specific standards from the field of road traffic. 7. Systematization of BAS standards in the field of road traffic 8. Examples of standards from ICS classification groups: road vehicles in general, road vehicle systems, internal combustion engines. Analysis of the field of application and structure of the standard 9. Examples of standards from ICS classification groups: commercial vehicles, passenger vehicles, caravans and light trailers, vehicles for special purposes. Analysis of the field of application and structure		

	of the standard 10. Examples of standards from the ICS classification group: diagnostic, maintenance and testing equipment. Analysis of the field of application and structure of the standard 11. Examples of standards from the field of ICS classification: packaging and distribution of goods - freight distribution. Analysis of the scope of application and structure of standards. 12. Examples of standards from the field of ICS classification: material handling equipment in cargo distribution. Analysis of the field of application and structure of the standard 13. New Access Directives. Basic principles and goals. 14. Harmonized European standards in the field of road traffic 15. Examples of harmonized standards relating to individual components of road vehicles. Analysis of the field of application and structure of the standard
Learning outcomes:	Knowledge: The course allows students to familiarize themselves with standards in the field of road traffic at all levels and categorized according to the ICS classification within the scope of work of the BAS TC and corresponding international and European TCs. Through the teaching process of lectures, exercises and preparation of a seminar paper, the student will be able, based on the acquired knowledge, to: Correctly approach the selection of standards for certain conditions of exploitation both from the aspect of the drive engine and from the aspect of other systems installed on the vehicle... Skills:- uses technical literature, manuals and tables in the field. - Monitors and acquires knowledge from professional subjects related to standards related to road traffic safety Competencies:- by mastering knowledge of the basic principles of application of standards related to the functionality of the system in which road vehicles participate, and the student acquires competencies related to the procedures of technical maintenance, certification and homologation of vehicles
Sustainable Development Goal (SDG):	– Goal 7: Affordable and clean energy – Goal 9: Industry, innovation and infrastructure – Goal 11: Sustainable cities and communities – Goal 12: Responsible consumption and production – Goal 13: Climate action – Goal 3: Health and well-being – Goal 16: Peace, justice and strong institutions – Goal 17: Partnership for the Goals
Teaching methods:	1. Lectures and discussions: The classic method in which theoretical knowledge is transferred to students. 2. Multimedia means: Using video materials, presentations, simulations and interactive tools for a better understanding of cities. 3. Workshops and exercises: Active learning through practical examples, working on problems, applying theory to real situations. 4. Projects and research: Work on projects related to road vehicles, eg designing safety systems. 5. Field visits: Visits to service centers, auto mechanic workshops, vehicle technical inspection stations, certification laboratories, homologation workshops, traffic police. 6. Online: Using online platforms, tools, learning resources and exchanging information as much as possible.

	7. Case studies: Analysis of real situations or problems related to road vehicles.
Assessment methods with grading structure:	The criteria for evaluating student performance and assessment during the course are as follows: Attendance at lectures and exercises: 0–10 points (%); Homework/seminar paper/practical work: 0–10 points (%); First partial exam/test/knowledge assessment: 0–15 points (%); Second partial exam/test/knowledge assessment: 0–20 points (%). The total number of points (%) a student can earn through continuous assessment during the course is a maximum of 55 points (%). The final exam carries a maximum of 45 points, i.e. 45 (%). The final exam covers the entire course material taught during the semester.
Literature:	Mandatory: 1. Behmen, A.: Salihović, S.:"Materijali i robe u transportu-knjiga I – klasifikacija, standardizacija, identifikacija", Fakultet za saobraćaj i komunikacije Sarajevo i DES Sarajevo, 2007. 2. Behmen, A.: Salihović, S.:"Materijali i robe u transportu-knjiga II – kvalitet: osnove, principi, kontrola", Fakultet za saobraćaj i komunikacije Sarajevo i DES Sarajevo, 2008. 3. Jagodić Z.: Roba u prometu, Institut za privredni inženjering Zenica, Zenica 2024. 4. Međunarodni/evropski/nacionalni standardi Supplementary: 1. F. Klisura: Standardizacija u cestovnom sobraćaju, predavanja, Fakultet za saobraćaj i komunikacije, Sarajevo, 2023 i 2024. 2. F. Klisura: Standardizacija u cestovnom saobraćaju, vježbe zadaci, Fakultet za saobraćaj i komunikacije, Sarajevo, 2023 i 2024.

Course code: **09-10-7TRTES020102**	**Course title:** **APPLICATION OF GIS IN TRAFFIC ENGINEERING**		
Level: II	**Year: I**	**Semester: I**	**Number of ECTS credits:** 6
Status: Mandatory Course		**Total number of contact hours: 90** Lectures: 45; Practical Exercises: 30; Seminars and Project Tasks: 15	
Course participants:			
Prerequisite for enrollment:	No		
Course goal (goals):	Familiarizing students with the fundamental concepts of GIS systems, their operational methods, planning, implementation, and potential applications.		
Topics covered (Units of study): *(if necessary, the weekly implementation plan is established taking into account the specificities of organizational units)*	1. The concept of Geographic Information Systems (GIS) 2. Components of GIS 3. The process of collecting and manipulating GIS data 4. Structure and models of spatial data 5. Database management 6. Coordinate systems, projections, georeferencing 7. Geographic data bases 8. Standardization in GIS 9. Output data and cartography 10. Techniques for graphical representation 11. Principles of layered representation of spatial data 12. Areas of application and basic GIS functions		

	13. Web and mobile GIS 14. Application of GIS in telecommunications infrastructure planning 15. Application of GIS in transportation infrastructure planning
Learning outcomes:	Knowledge: Students will become familiar with the fundamental concepts of GIS development and standardization, the principles of web and mobile GIS systems, and their specific applications with a particular focus on transportation and communications. They will learn about the process of developing GIS systems, from the initial idea and need for GIS, through data collection and formation of GIS databases, to georeferencing, graphical representation, and the use of GIS systems. Skills: Students will acquire proficiency in specific software tools needed for designing and developing GIS systems. Competencies: After passing the exam, students will be capable of planning, designing, and developing GIS systems, and selecting appropriate technologies for developing specific solutions.
Sustainable Development Goal (SDG):	SDG 9 – Industry, Innovation, and Infrastructure SDG 11 – Sustainable Cities and Communities
Teaching methods:	The course is delivered through lectures, practical exercises, and hands-on laboratory work. Lectures are conducted through oral presentations with slides and practical examples. Exercises and laboratory work involve the use of software tools to address specific problems and practical tasks. Students will be required to prepare and present seminar papers and/or project tasks. Various methods are employed during the course, including oral presentations, discussions, demonstrations, individual and group work, etc.
Assessment methods with grading structure:	Grading and Evaluation: The total number of points a student can earn during the course is 50, with another 50 points available in the final exam. The points for the course are distributed among assignments and activities and/or seminar papers and/or project tasks, and the partial exam. The final/re-sit exam covers material not included in the partial exam, meaning it includes the second part of the material worth 50 points for students who have passed the partial exam. Students who have not passed the material covered in the partial exam will take the material from both the partial and final exams. The final/re-sit exam will be organized as a written and/or oral exam, including a practical component. The overall evaluation of all student obligations during the semester, including the exam grade, is based on the total number of points earned from fulfilling pre-exam obligations, the partial exam, and the final exam. Based on the quality of acquired knowledge and skills, a student can earn a maximum of 100 points, according to the following scale: Grading Structure: – Seminar / Class Participation / Project Task: 20 points (20%) – First Test / First Knowledge Check (Partial Exam): 30 points (30%) – Final or Re-sit Exam (Second Partial Exam): 50 points (50%) Passing Criteria: To pass, a student must earn at least 55 points in total and achieve at least 55% of the points on the knowledge checks (partial exam and final/re-sit exam). Final Grade System: After all forms of knowledge assessment, the student's performance is evaluated and graded as follows: a) 10 - Excellent performance with no errors or minimal errors (95-100 points) b) 9 - Above average, with a few errors (85-94 points) c) 8 - Average, with noticeable errors (75-84 points) d) 7 - Generally good, but with significant deficiencies (65-74 points) e) 6 - Meets minimum

	requirements (55-64 points) f) 5 - Does not meet minimum requirements (less than 55 points)
Literature:	Mandatory: 1. Alem Čolaković, "Geographic Information Systems (LECTURE NOTES)," Faculty of Traffic and Communications, Sarajevo, 2023. Supplementary: 1. Kang Tsung Chang, „*Introduction to Geographic Information Systems*“, McGraw-Hill Education, 2019. 2. Paul Bolstad, „*GIS Fundamentals A First Text on Geographic Information Systems*,“ Eider Press, 2016. 3. Ian Heywood, Sarah Cornelius, „*An introduction to geographical information systems*“, Pearson Education Limited, 2006. 4. Kurt Menke, Richard Smith Jr., Luigi Pirelli, John Van Hoesen, „*Mastering QGIS*“,“ Packt Publishing Ltd., 2016. 5. Gábor Farkas, „Practical GIS,“ Packt Publishing Ltd., 2017. 6. Anita Graser, „*Learning QGIS*,“ Packt Publishing Ltd., 2016. 7. Ralph M. Stair, George W. Reynolds, „*Fundamentals of Information Systems*,“ Cengage Learning, 2016. 8. Alan Dennis, Barbara Haley Wixom, Roberta M. Roth, „*Systems analysis and design*,“ Wiley, 2015. 9. Patricia Wallace, „*Introduction to Information Systems*,“ Pearson Education, 2015. 10. Arthur M. Langer, „*Analysis and Design of Information Systems, Springer-Verlag*,“ 2008. 11. John Wang, „*Innovations in Supply Chain Management for Information Systems*,“ Business Science Reference, 2010. 12. Christos Kalloniatis: “*Modern Information Systems*,“ InTech Croatia, 2012.

Course code: **09-10-8TRTES020102**	**Course title:** **ELECTRIC AND AUTONOMOUS ROAD VEHICLES**		
Level: II	**Year: I**	**Semester: II**	**Number of ECTS credits:** 6
Status: Elective subject		**Total number of contact hours: 90** Lectures: 30 Exercises: 30 Seminar: 10 Field work: 10 Laboratory exercises: 5 Practice: 5	
Course participants:	**Academic staff and associates selected in the field to which the course belongs/course**		
Prerequisite for enrollment:	No		
Course goal (goals):	Acquiring knowledge about the basics of the concept of electric and autonomous road vehicles, the basic elements of the safety system, the associated adaptive infrastructure, and management and functioning processes.		
Topics covered (Units of study): *(if necessary, the weekly implementation plan is*	1. Concept basics of electric road vehicles 2. Basic systems and elements of electric road vehicles 3. Safety standards and requirements for electric road vehicles and infrastructure		

established taking into account the specificities of organizational units)	4. Elements of the safety system of electric road vehicles and infrastructure 5. Electric road vehicles and the concept of sustainable urban mobility 6. EU plans for electromobility in road traffic 7. Basics of the concept of autonomous road vehicles 8. Basic systems and elements of autonomous road vehicles 9. Safety standards and requirements for autonomous road vehicles and adaptive infrastructure 10. Elements of the safety system of autonomous road vehicles and adaptive infrastructure 11. Smart cities and sustainable urban mobility 12. EU plans for autonomous mobility in road traffic 13. IoT solutions and autonomous vehicles 14. Computer networks and protocols in autonomous road vehicles 15. Artificial intelligence and autonomous road vehicles
Learning outcomes:	Knowledge: Acquisition of basic knowledge about the basics of electric and autonomous road vehicles, basic standards and regulations, basic systems, elements of traffic safety, exploitation and management. Skills: Ability to independently understand and recognize problems in the functioning processes of electric and autonomous road vehicle systems and adaptive infrastructure. Competencies: Application theoretical and practical knowledge in function promotions system security of the concept electrical and autonomous road vehicles and adaptive infrastructure.
Sustainable Development Goal (SDG):	SDG3 – Good health and wellbeing; SDG11 – Sustainable cities and communities
Teaching methods:	Lectures accompanied multimedia presentations . Solving practical problems and specific ones project tasks .
Assessment methods with grading structure:	Assessment of creativity in classes and exercises with the creation of independent works, assessment of the partial test during the class as well as the assessment of the final exam. Criterion monitoring the work and evaluating the student during classes, according to the following method: – Seminar/Field work/Lab. exercises/Practice/ 15 points (%), passed if more than 50% is won. – I Partial exam/test/knowledge check/35 points (%), passed if more than 55% is won. – Final exam (II Partial) 50 points (%), passed if over 55% is won. – Final exam (Integral) 85 points (%), passed if more than 55% is won. The total number of points (%) that a student can achieve according to the mentioned monitoring during classes is a maximum of 50 points (%), which with the Final (II partial) makes 100 points (%). For students who did not pass the 1st Partial exam, the Final exam (Integral) is organized from the entire material covered during classes and exercises, and is evaluated with 85 points (%), which with the seminar work/practical work makes 100 points (%). The final success of the student, after all the foreseen forms of knowledge testing, is evaluated and graded by the grading system as follows: a) 10 (A) - exceptional success without errors or with minor errors, carries 95-100 points; b) 9 (B) - above average, with some errors, carries 85-94 points; c) 8 (C) - average, with noticeable errors, carries 75-84 points; d) 7 (D) - generally good, but with significant shortcomings, carries 65-74 points; e) 6 (E) - meets the minimum requirements, carries 55-64 points; f) 5 (F, FX) - does not meet the

	minimum requirements, less than 55 points. The total evaluation of all the student's obligations during the semester, i.e. the grade on the exam, is based on the total number of points (%) that the student earned by fulfilling pre-exam obligations and passing the partial and final exam, and according to the quality of acquired knowledge and skills, and contains a maximum of 100 points, and is determined according to the following scale: Student obligations _____Points (%) Attendance at lectures and exercises.....80 (%) Seminar/Field work/Lab exercises/Practice /.....15 points (%) I Partial exam/Test/Knowledge check/.....35 points (%) Final exam (II Partial) .....50 points (%) Final exam (Integral) .....85 points (%)
Literature:	Mandatory: 1. B. Schoettl , et all , A survey of public opinion about autonomous and self-driving vehicles in the US, the UK, and Australia . in 2014 2. D. Howard , D. Dai , Public perceptions of self-driving Emperor : The cases of Berkeley, California . In: Transportation Research Board 93rd Annual Meeting . in 2014 3. Di Natale , et all , Understanding and Using the Controller Area Network Communication Protocol – Theory and Practice Springer New York, 2014. 4. Electric Car - history and components , M. Stojkov, D. Gašparović , D. Pelin, H. Glavaš, K. Hornung , N. Mikulandra, 12th Natural Gas, Heat and Water Conference , 5th International Natural Gas, Heat and Water Conference , 2014 5. F. Gandoman , J. Van Mierlo , A. Ahmadi, S. Abdel Aleem , Chapter 15: Safety and reliability evaluation for electric vehicles in modern power system networks , Distributed Energy Resources in Microgrids , 2019, Pages 389-404 6. F. Michael Ashby , Case Study : Electric Cars , Materials and Sustainable Development, 2016 7. O. Lindov , Safety in Road Traffic, Faculty of Traffic and Communications, University of Sarajevo, Sarajevo, 2008. 8. O. Lindov , Transport and Environment, Faculty of Traffic and Communications, University of Sarajevo, Sarajevo, 2011. 9. O. Lindov , A. Omerhodžić , Diagnostics and maintenance of road vehicles (script of lectures and exercises), Faculty of Traffic and Communications, University of Sarajevo, Sarajevo, 2015. 10. S. Dacić , Fundamentals of Mechanical Engineering, Faculty of Traffic and Communications, University of Sarajevo, Sarajevo, 2007. 11. S. Dacić , M. Trobradović , B. Pikula, Fundamentals of vehicle dynamics - puzzle of tasks, Faculty of Mechanical Engineering, University of Sarajevo, 2008. 12. S. Narla , The evolution of connected vehicle technology : From smart drivers to smart cars to self-driving emperor Institute of Transportation Engineers . ITE Journal, 2013, 83.7: 22. 13. V. Issakov Microwave Circuits for 24 GHz Automotive Radar in Silicon-based Technologies Springer Verlag , Berlin Heidelberg , 2010. Supplementary: 1. C. Urmson , et al, Self-driving Tsar and the urban challenge . IEEE Intelligent Systems, 2008, 23.2.

	2. O. Lindov , A. Omerhodžić , Sustainable development and environmental engineering (script of lectures and exercises), Faculty of Traffic and Communications, University of Sarajevo, Sarajevo, 2018. 3. V. Jain , P. Heydari Automotive Radar Sensors in Silicon Technologies Springer , New York, London, 2013. 4. W. Mitchell, R. Chin , A. Sevtsuk , Chapter 11 - The Media Laboratory City Car: A New Approach to Sustainable Urban Mobility , Urban Energy Transition , 2008 pp : 267-282

Course code: **09-10-9TRTES020102**	**Course title:** **E-VEHICLE IN PUBLIC TRANSPORT AND E-CAR SHARING**		
Level: II	**Year: I**	**Semester: II**	**Number of ECTS credits: 6**
Status: Elective Course		**Total number of contact hours: 90** Optional breakdown of hours by type: Lectures: 30 Tutorials: 30 Seminars: 10 Fieldwork: 10 Laboratory Tutorials: 10	
Course participants:	**Academic staff and associates selected in the field to which the course belongs/course**		
Prerequisite for enrollment:	None		
Course goal (goals):	To enable students to acquire basic professional knowledge and skills about the application of electric vehicles in public transport, as well as the E-car sharing system. The aim of the course is to train students to understand, analyze and apply the concept of electromobility to public transport in order to develop and promote the concept of sustainable urban mobility.		
Topics covered **(Units of study):** *(if necessary, the weekly implementation plan is established taking into account the specificities of organizational units)*	1. Overview of legal regulations related to E-vehicles and E-car sharing systems. 2. Electric vehicles in public transport, use and comparative analysis. 3. Batteries for electric vehicles with a focus on electric buses and trucks. 4. Charging stations for electric vehicles, classification, performance and risks. 5. Safety aspect of electric vehicles. 6. Transport performance parameters of electric vehicles. 7. Devices for testing electronic systems in the vehicle. 8. The efficiency of changing the conventional vehicle fleet to electric. 9. Analysis of devices and applications that enable the application of the e-car sharing system. 10. Determining the efficiency and profitability of the e-car sharing system. 11. Organization and determination of locations for e-car sharing systems. 12. Ownership of the e-car sharing system, insurance and liability. 13. Management and organization of the E-car sharing system. 14. Regulation and support for the integration of E-car sharing into the public transport system. 15. The role and importance of Smart Grid technologies in public transport and the E-car sharing system.		
Learning outcomes:	– Acquisition of knowledge and skills for the ability to comprehensively understand the concept of electromobility and E-car sharing in public transport. – Competence for practical application of acquired knowledge in real		

<table>
<tr><td></td><td>situations.
– Development of initiatives, electromobility and E-car sharing in public transport.
– Acquisition of knowledge for the implementation and management of the concept of electromobility and E-car sharing.
– Gaining knowledge for Smart Grid technology in public transport and E-car sharing system.</td></tr>
<tr><td>Sustainable Development Goal (SDG):</td><td>SDG7 –Ensure access to affordable, reliable, sustainable, and modern energy for all
SDG9 – Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation
SDG11 – Make cities and human settlements inclusive, safe, resilient, and sustainable
SDG13 – Take urgent action to combat climate change and its impacts</td></tr>
<tr><td>Teaching methods:</td><td>• Lectures accompanied by multimedia presentations
• Practical exercises with analysis of concrete examples from practice</td></tr>
<tr><td>Assessment methods with grading structure:</td><td>
<table>
<tr><td colspan="4">Knowledge assessment (maximum number of points: 100)</td></tr>
<tr><td>Pre-examination obligations</td><td>points</td><td>Final test</td><td>points</td></tr>
<tr><td>Activity during the lecture</td><td>-</td><td>Written exam</td><td>50</td></tr>
<tr><td>Practical classes</td><td>-</td><td>Oral examination</td><td>-</td></tr>
<tr><td>Colloquiums</td><td>35</td><td></td><td></td></tr>
<tr><td>Seminar work</td><td>15</td><td></td><td></td></tr>
<tr><td>In total</td><td></td><td>In total</td><td>100</td></tr>
</table>
</td></tr>
<tr><td>Literature:</td><td>1. A. Sbihi and RW Eglese, Combinatorial optimization and Green Logistics, 4OR-A Quarterly Journal of Operations Research, 2007
2. Basarić, V.: A model for managing the distribution of trips to modes of transport in the function of sustainable development, Doctoral dissertation, Faculty of Technical Sciences, University of Novi Sad, 2010.
3. Dalkmann H., Brannigan C.: Transport and climate change, Modul 5e: Sustainable transport: A sourcebook for policy-makers in developing cities, Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH, Eschborn, Germany. in 2007
4. Gwilliam, K. (ed): Cities on the Move: A World Bank Urban Transport Strategy Review, Strategy Paper, Washington, DC: World Bank, 2001.
5. Integration of electric powered vehicles (electric cars) into the power system and their impact on improving air quality in a part of the City of Sarajevo, Institute for Traffic and Communications doo Sarajevo, 2017
6. J.-M. Timmermans, J. Matheys, JV Mierlo and P. Lataire, Environmental rating of vehicles with different fuels and drive trains: A univocal and applicable methodology, European Journal of Transport and Infrastructure Research, 2006
7. K. Krawiec, S. Markusik, G. Sierpiński, Electric Mobility in Public Transport—Driving Towards Cleaner Air, Intelligent Transportation and Infrastructure, 2021
8. L. Turcksin, O. Mairesse, C. Macharis and JV Mierlo, Encouraging Environmentally Friendlier Cars via Fiscal Measures: General Methodology and Application to Belgium, Energies, 2013
9. Lah, O.: Sustainable Urban Mobility Pathways, Wuppertal Institute for Climate, Environment and Energy & Climate Action Implementation Facility, Berlin, Germany, 2019.
10. Legal regulation of national and lower levels
11. Lindov O., Pikula B.: Electromobility models and sustainable urban development – Sarajevo case study, International Conference Towards a</td></tr>
</table>

	Human City, 2019. 12. M. Mustafa, Planning in Traffic, Transport and Communications, University of Sarajevo, Faculty of Traffic and Communications, 2017 13. International and European standards in the field of electric vehicles 14. P. Eng., N. Enge, S. Zoepf, Electric Vehicle Engineering, 1st Edition, McGraw Hill, 2021 15. Zietsman J., Rilett LR: Sustainable Transportation: Conceptualization and Performance Measures, Report No. SWUTC/02/167403-1, Texas Transportation Institute, The Texas A&M University System College Station, Texas. in 2002 16. A. Sbihi and RW Eglese, Combinatorial optimization and Green Logistics, 4OR-A Quarterly Journal of Operations Research, 2007 17. Basarić, V.: A model for managing the distribution of trips to modes of transport in the function of sustainable development, Doctoral dissertation, Faculty of Technical Sciences, University of Novi Sad, 2010. 18. Dalkmann H., Brannigan C.: Transport and climate change, Modul 5e: Sustainable transport: A sourcebook for policy-makers in developing cities, Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH, Eschborn, Germany. in 2007 19. Gwilliam, K. (ed): Cities on the Move: A World Bank Urban Transport Strategy Review, Strategy Paper, Washington, DC: World Bank, 2001. 20. Integration of electric powered vehicles (electric cars) into the power system and their impact on improving air quality in a part of the City of Sarajevo, Institute for Traffic and Communications doo Sarajevo, 2017 21. J.-M. Timmermans, J. Matheys, JV Mierlo and P. Lataire, Environmental rating of vehicles with different fuels and drive trains: A univocal and applicable methodology, European Journal of Transport and Infrastructure Research, 2006 22. K. Krawiec, S. Markusik, G. Sierpiński, Electric Mobility in Public Transport—Driving Towards Cleaner Air, Intelligent Transportation and Infrastructure, 2021 23. L. Turcksin, O. Mairesse, C. Macharis and JV Mierlo, Encouraging Environmentally Friendlier Cars via Fiscal Measures: General Methodology and Application to Belgium, Energies, 2013 24. Lah, O.: Sustainable Urban Mobility Pathways, Wuppertal Institute for Climate, Environment and Energy & Climate Action Implementation Facility, Berlin, Germany, 2019. 25. Legal regulation of national and lower levels 26. Lindov O., Pikula B.: Electromobility models and sustainable urban development – Sarajevo case study, International Conference Towards a Human City, 2019. 27. M. Mustafa, Planning in Traffic, Transport and Communications, University of Sarajevo, Faculty of Traffic and Communications, 2017 28. International and European standards in the field of electric vehicles 29. P. Eng., N. Enge, S. Zoepf, Electric Vehicle Engineering, 1st Edition, McGraw Hill, 2021 30. Zietsman J., Rilett LR: Sustainable Transportation: Conceptualization and Performance Measures, Report No. SWUTC/02/167403-1, Texas Transportation Institute, The Texas A&M University System College Station, Texas. in 2002

Course code: **09-10-10TRTES020102**	**Course title:** **REGULATIONS AND CLASSIFICATION IN THE TRANSPORT OF DANGEROUS GOODS**

Level: II	**Year: I**	**Semester: II**	**Number of ECTS credits: 6**
Status: Elective Course		**Total number of contact hours: 90** Optional breakdown of hours by type: Lectures: 30 Tutorials: 30 Seminars: 10 Fieldwork: 10 Laboratory Tutorials: 10	

Course participants:	**Academic staff and associates selected in the field to which the course belongs/course**
Prerequisite for enrollment:	None
Course goal (goals):	The course goals are to provide students with a comprehensive understanding of TDG regulations, classifications, and compliance requirements in order to ensure safe and compliant transportation of dangerous goods.
Topics covered **(Units of study):** *(if necessary, the weekly implementation plan is established taking into account the specificities of organizational units)*	1. Introduction to TDG Regulations and Objectives. 2. Stakeholders in TDG: Roles and Responsibilities. 3. Classification Systems for Dangerous Goods. 4. Packaging, Labeling, and Marking Requirements. 5. Documentation and Reporting Obligations in TDG. 6. Safety Considerations and Risk Management in TDG. 7. Roles and Responsibilities of Shippers, Carriers, and Consignees. 8. Emergency Response Procedures in TDG. 9. Global Harmonization Efforts in TDG Regulations. 10. Environmental Impact and Sustainability in TDG. 11. Exemptions and Special Provisions in TDG. 12. Legal Consequences and Penalties in TDG. 13. Training Programs and Strategies for TDG Awareness. 14. Case Studies: Applying TDG Regulations in Practical Situations. 15. Course Review and Wrap-Up: Key Concepts and Future Considerations. Practical teaching: The course will incorporate practical components such as laboratory sessions and field visits, where students will have hands-on experience using measuring equipment and software packages to apply the theoretical knowledge gained. These practical activities will reinforce understanding and allow students to implement TDG regulations and classification systems in real-world scenarios.
Learning outcomes:	– Understanding the regulations of TDG. – Understanding the principles of TDG regulations – Understanding the objectives and legal framework of tom regulations. – Applied systems and classification criteria for accurate identification of Hazardous Substances. – Applied systems and classification criteria for accurate identification for classification for safe transport. – Applied systems and classification criteria for accurate identification for classification according to the requirements for packaging, marking. – Applied systems and classification criteria for accurate identification for classification for proper handling and communication of hazardous substances. – Education and expertise in documenting, reporting and emergency response procedures for TDG incidents. – Analyze and assess safety considerations, risks and environmental impacts

<table>
<tr><td></td><td>TDG.
– Implementing sustainable practices and global tom harmonization efforts.</td></tr>
<tr><td>Sustainable Development Goal (SDG):</td><td>SDG3 –Ensure healthy lives and promote well-being for all at all ages
SDG9 – Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation
SDG11 – Make cities and human settlements inclusive, safe, resilient, and sustainable
SDG13 – Take urgent action to combat climate change and its impacts</td></tr>
<tr><td>Teaching methods:</td><td>– Lecture with multimedia presentation
– Auditorium and laboratory exercise</td></tr>
<tr><td>Assessment methods with grading structure:</td><td>
<table>
<tr><td colspan="4">Knowledge assessment (maximum number of points: 100)</td></tr>
<tr><td>Pre-exam requirements</td><td>points</td><td>Final exam</td><td>points</td></tr>
<tr><td>Activity during the lecture</td><td>-</td><td>Written exam</td><td>50</td></tr>
<tr><td>Practical teaching</td><td>-</td><td>Oral exam</td><td>-</td></tr>
<tr><td>Colloquia</td><td>35</td><td></td><td></td></tr>
<tr><td>Seminar paper/project</td><td>15</td><td></td><td></td></tr>
<tr><td>Total credits</td><td></td><td>Total credits</td><td>100</td></tr>
</table>
</td></tr>
<tr><td>Literature:</td><td>1. Transportation of Dangerous Goods: A Guide to the UN Model Regulations, United Nations
2. IMDG Code: International Maritime Dangerous Goods Code, International Maritime Organization (IMO), 2022
3. IATA Dangerous Goods Regulations, International Air Transport Association (IATA), 2023
4. ADR: European Agreement Concerning the International Carriage of Dangerous Goods by Road, United Nations Economic Commission for Europe (UNECE), 2023
5. The Regulation concerning the International Carriage of Dangerous Goods by Rail (RID), Intergovernmental Organisation for International Carriage by Rail, 2023
6. ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways, United Nations, 2021
7. J.J. Keller & Associates, Hazardous Materials Compliance Pocketbook, 2022
8. Emergency Response Guidebook (ERG), U.S. Department of Transportation (DOT), 2020
9. Alija Behmen, Sabira Salihović, Materijali i robe u transportu – Knjiga I, University of Sarajevo, Faculty of Traffic and Communications, 2007
10. Alija Behmen, Sabira Salihović, Materijali i robe u transportu – Knjiga I, University of Sarajevo, Faculty of Traffic and Communications, 2008
11. Legal regulation of national and lower levels
12. Internal educational documents of the Faculty of Traffic and Communications</td></tr>
</table>

Course code: **13-14-15-1TRTES020203**	**Course title:** **ELEMENTS OF TRAFFIC ACCIDENTS EXPERTISE**		
Level: II	**Year: II**	**Semester: III**	**Number of ECTS credits: 6**
Status: Elective Course		**Total number of contact hours: 90** Optional breakdown of hours by type: Lectures: 30 Tutorials: 30 Seminars: 10 Fieldwork: 10	

	Laboratory Tutorials: 10 Practice
Course participants:	**Academic staff and associates selected in the field to which the course belongs/course**
Prerequisite for enrollment:	No
Course goal (goals):	Acquisition of educational forms in the implementation of programs in the field of traffic accident expert reports, as well as the analysis of specific traffic accidents.
Topics covered (Units of study): *(if necessary, the weekly implementation plan is established taking into account the specificities of organizational units)*	1. Introduction – Basics of Traffic Accident Expert Reports, Instructions for Preparing a Traffic Accident Expert Report 2. Traffic Accident Report 3. Traffic Accident Sketch 4. Photo Documentation of the Traffic Accident Scene 5. Traffic Accident Traces on the Roadway 6. Traffic Accident Traces on the Vehicle 7. Other Traffic Accident Traces 8. Motor Vehicle Collisions with Pedestrians 9. Motor Vehicle Collisions 10. Motor Vehicle Run-off-road Accidents 11. Traffic Accidents Involving Cyclists 12. Characteristic Examples of Traffic Accidents 13. Preparation of a Traffic Accident Expert Report – Examples of Determining the Point of Contact and Speeds 14. Preparation of a Traffic Accident Expert Report – Examples of Time-space Analysis of the Traffic Accident 15. Preparation of a Traffic Accident Expert Report – Examples of Accident Dynamics
Learning outcomes:	Knowledge: Theoretical and practical knowledge in the field of traffic accident expert reports. Basic rules, methods, and procedures for preparing analyses and expert reports on specific traffic accidents. Skills: The ability to apply theoretical and practical knowledge in the field of traffic accident analysis and expert reports. Competencies: The ability to independently understand and use professional literature, apply methods and procedures, and use software tools in the preparation of analyses and expert reports on specific traffic accidents.
Sustainable Development Goal (SDG):	"SDG3 – Good Health and Well-being"; "SDG9 – Industry, Innovation, and Infrastructure"; "SDG11 – Sustainable Cities and Communities"; "SDG16 – Peace, Justice, and Strong Institutions."
Teaching methods:	Presentation with the display of various types of traffic accidents using video and audio recordings, software, simulators, and independent presentations of specific traffic accidents. Initiating discussions and debates on practical issues, individual observations from different environments, and the preparation of independent analyses and expert reports on traffic accidents.
Assessment methods with grading structure:	Evaluation of activities in lectures and exercises, along with the preparation of independent work, assessment of the mid-term test during the course, and the final exam. The criteria for monitoring and assessing student performance during the course are as follows: – Seminar/Fieldwork/Lab Exercises/Practice (written and oral assessment) – 15 points (%), passed if over 50% is achieved. – Mid-term exam/test/knowledge check (written assessment) – 35

	points (%), passed if over 50% is achieved. – Final exam (Second Mid-term) (written assessment) – 50 points (%), passed if over 50% is achieved. – Final exam (Comprehensive) (written assessment) – 85 points (%), passed if over 50% is achieved. The total number of points (%) a student can achieve through this monitoring system during the course is a maximum of 50 points (%), which combined with the Final (Second Mid-term) totals 100 points (%). For students who did not pass the First Mid-term exam, the Final (Comprehensive) exam is organized covering all the material taught during lectures and exercises and is worth 85 points (%), combined with the seminar/practical work to make a total of 100 points (%). To pass the course, students must pass each of the following parts: the seminar paper, the first mid-term exam (test), and the final exam (second mid-term or comprehensive). The evaluation of the seminar paper and the first mid-term exam (test) is conducted during the course. Students who pass the first mid-term exam only take the second mid-term exam in the final exam, while those who do not pass the first mid-term exam will take the comprehensive final exam, which consists of both the first and second mid-term exams. Students who did not pass the exam in the previous academic year but fulfilled certain obligations and earned points can carry them over to the current academic year. Students who wish to carry over points must inform the course instructor at the start of the semester, by the end of the first week of lectures. Points may be carried over only once. The final student grade after all forms of knowledge assessment will be evaluated and graded according to the following system: a) 10 (A) – exceptional performance with no or minimal errors, 95-100 points; b) 9 (B) – above average, with some errors, 85-94 points; c) 8 (C) – average, with noticeable errors, 75-84 points; d) 7 (D) – generally good, but with significant deficiencies, 65-74 points; e) 6 (E) – meets minimum requirements, 55-64 points; f) 5 (F, FX) – does not meet minimum requirements, less than 55 points. The total assessment of all student obligations during the semester, i.e., the exam grade, is based on the total number of points (%) the student has achieved by fulfilling pre-exam obligations and passing the mid-term and final exams. This totals a maximum of 100 points, and is determined according to the following scale: Student Obligations Points (%) Attendance in lectures and exercises ……..... 0 points Minimum 80% attendance at all forms of classes is mandatory, and this is a condition for course certification/signing off on proper attendance. Seminar Paper/Fieldwork/Lab Exercises/Practice (written and oral assessment).....15 points (%) First Mid-term Exam (written).....35 points (%) Final Exam (Second Mid-term) (written).....50 points (%) Final Exam (Comprehensive) (written).....85 points (%)
Literature:	Mandatory: 1. Lindov, O.: Road Traffic Safety, University book, Faculty of Traffic and Communications, Sarajevo, 2008. 2. Lindov, O., Omerhodžić, A.: Elements of Traffic Accident Expertise, Lecture Notes, Faculty of Traffic and Communications, Sarajevo, 2013. 3. Lindov, O., Omerhodžić, A.: Elements of Traffic Accident

	Expertise, Exercise and Test Notes, Faculty of Traffic and Communications, Sarajevo, 2013. 4. Lindov, O.: Simulation Models of Vehicle-Pedestrian Collisions, Master's Thesis, Faculty of Traffic and Communications, 1998. 5. Lindov, O.: Traffic Accident Expertise, Faculty of Traffic and Communications, Sarajevo, 1998-2006. 6. Lindov, O.: Contribution to the Study of Vehicle-Pedestrian Collisions, Doctoral Dissertation, Faculty of Traffic and Communications, May 2002. 7. Lindov, O.: Manual for Strengthening the Capacity of the Road Safety Profession, Faculty of Traffic and Communications, University of Sarajevo, Erasmus+ Project Trafsaf, Sarajevo, 2020. 8. Rotim, F.: Elements of Road Traffic Safety - Volume 1 – Traffic Accident Expertise, Modern Traffic, Zagreb, 1990. Supplementary: 1. Rotim, F.: Elements of Road Traffic Safety - Volume 2 – Vehicle Kinetics, Modern Traffic, Zagreb, 1991. 2. Rotim, F.: Elements of Road Traffic Safety - Volume 3 – Vehicle Collisions, Modern Traffic, Zagreb, 1992. 3. Dragač, R.: Road Traffic Safety – Book III, Traffic Faculty, Belgrade, 1994. 4. Čović, M., Zečević, D.: Forensic Analysis in Road Traffic, Informator, Zagreb, 1987. 5. Golubić, J.: Fundamentals of Traffic Technique and Safety, Faculty of Traffic Sciences, Zagreb, 1992. 6. PC CRASH, Simulation Program for Vehicle Accidents, Linz, Austria. 7. Accident Reconstruction Newsletter, San Diego, Canada.

Course code: **13-14-15-2TRTES020203**	**Course title:** **MANAGEMENT AND ORGANIZATION OF LOGISTICS CENTERS IN TRAFFIC AND TRANSPORT**		
Level: II	**Year: II**	**Semester: III**	**Number of ECTS credits: 6**
Status: Elective Course		**Total number of contact hours: 90** Optional breakdown of hours by type: Lectures: 45 Tutorials: 30 Seminars:15	
Course participants:	**Academic staff and associates selected in the field to which the course belongs/course**		
Prerequisite for enrollment:	None		
Course goal (goals):	Acquiring basic knowledge about the management and organization of logistics centers, technological changes in logistics centers, and the requirements for the organization and development of modern logistics centers		
Topics covered (Units of study): *(if necessary, the weekly implementation plan is established taking into account the specificities of*	1. Historical Foundations of the Development of the Science of Organization and Management Principles. 2. The Concept, Definition, Subject, and Method of the Science of Organization. 3. Modern Theories of Organization and Management. 4. Concepts and Types of Logistics Organization. 5. Logistics Providers.		

organizational units)	6. Transport Management. 7. New Logistics Strategy for Supply, Distribution, and Customer Expectations. 8. Factors Influencing the Organizational Structure of Logistics Tasks. 9. Logistics Centers: Possible Forms of Logistics Centers. 10. Criteria for Selecting the Location of Logistics Centers. 11. Effects of the Development of Logistics Centers. 12. Logistics Centers as a Strategically Significant Factor for Improving Service Quality. 13. Contemporary Concept of Logistics Center Development. 14. Human Resource Management as a Function of Management. 15. Trends in the Development of Transport and Logistics Services in Bosnia and Herzegovina.
Learning outcomes:	Knowledge: Through lectures, exercises, and seminar work, students should acquire appropriate knowledge and experience in the field of management and organization of logistics centers and terminals. The subject of study should ensure a critical level of competencies and knowledge necessary for solving specific problems in the areas of management, organization, and planning of logistics centers. Skills: Upon completion of the course, students will be able to understand the processes of managing logistics centers, evaluate appropriate methods in the management process, and assess suitable methods in the organization of work in logistics distribution centers. Competencies: Application of acquired knowledge in specific models.
Sustainable Development Goal (SDG):	SDG 8 - Decent Work and Economic Growth Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all. SDG 9 - Industry, Innovation, and Infrastructure Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation. SDG 12- Responsible Consumption and Production Ensure sustainable consumption and production patterns.
Teaching methods:	Teaching is conducted through lectures and exercises. Lectures are delivered through oral presentations with examples. Discussions on management and organization issues in logistics systems are initiated. Students will be required to prepare and present seminar papers. Various methods are employed in the teaching process, including: oral presentations and discussions, demonstrations of examples, video presentations, and encouraging independent work through appropriate methodological approaches.
Assessment methods with grading structure:	Assessment includes creativity in lectures and exercises through independent work, partial tests during the course, and the final exam. The criteria for monitoring and evaluating student performance are as follows: – Homework/Seminar/Practical Work: 15 points (%), passed if at least 55% is achieved. – First Partial Exam/Test/Knowledge Check: 35 points (%), passed if at least 55% is achieved. – Final Exam (Second Partial): 50 points (%), passed if at least 55% is achieved. – Final Exam (Comprehensive): 85 points (%), passed if at least 55% is achieved. The final exam is organized as written/oral. The student may take the

	material that was not covered and/or successfully completed during the semester. The required condition for a successful exam is achieving at least 55% of the total points on the partial and final exam parts. A sufficient condition is that the sum of points earned (through homework, attendance, partial, and final exams) is 55. Homework is organized through writing assignments and projects, with no option for resubmission. For students who did not successfully complete the partial exam, the final exam consists of the entire material covered during the course. The make-up exam is organized similarly to the final exam. Student performance after all forms of assessment is graded as follows: a) 10 (A) – Outstanding success with no or minor errors, 95-100 points; b) 9 (B) – Above average, with some errors, 85-94 points; c) 8 (C) – Average, with noticeable errors, 75-84 points; d) 7 (D) – Generally good, but with significant deficiencies, 65-74 points; e) 6 (E) – Meets minimal conditions, 55-64 points; f) 5 (F, FX) – Does not meet minimal conditions, less than 55 points. The overall evaluation of all student obligations during the semester, or the exam grade, is based on the total number of points (%) earned through fulfilling pre-exam obligations and taking partial and final exams, with a maximum of 100 points, determined by the following scale: – Attendance in lectures and exercises: - – Homework/Seminar/Practical Work: 15 points (%) – First Partial Exam/Test/Knowledge Check: 35 points (%) – Final Exam (Second Partial): 50 points (%) – Final Exam (Comprehensive): 85 points (%) The exam is conducted both in writing and orally. Note: A student must pass the first knowledge assessment, seminar paper, and final exam by achieving 50% or more of the maximum possible points. The grading scale may be adjusted according to the Rules of Study at the University of Sarajevo (Article 45). Note: Students are required to attend all forms of instruction for at least 80% of the total hours. In justified cases (such as illness), a student may be absent from classes but must provide a medical justification. The seminar paper and homework will only be graded if submitted by the defined deadlines. Late submissions will not be graded.
Literature:	Mandatory: 1. Bilješke i slajdovi s predavanja (moći će se preuzeti na WEB site-u Fakulteta). 2. Skripta predavanja, „Upravljanje i organizacija logističkih centara u saobraćaju i transportu“, Fakultet za saobraćaj i komunikacije, 2024. godine Supplementary: 1. ČEKIĆ, Š., BOŠNJAK, I.: Menadžment u transportu i komunikacijama, Univerzitet u Sarajevu - Sveučilište u Zagrebu, Sarajevo - Zagreb, 2000. 2. IVAKOVIĆ, Č.: TERMINALI, Fakultet prometnih znanosti, Zagreb, 2006. 3. AČIMOVIĆ, S.: Marketing logistika, Ekonomski fakultet, Beograd, 2004. 4. ZELENIKA, R.: Logistički sustavi, Ekonomski fakultet u Rijeci, 2005.

	5. PERIŠIĆ, R.,A.: Sistem kvaliteta usluga logistika i informatika, Beograd, 2002. 6. BAHTJAREVIĆ-ŠIBER, F.: Managment ljudskih potencijala, Golden Marketing, Zagreb, 1999. 7. BOŽIĆ, V., RAKIĆ, S.: Poslovna logistika, Ekonomski fakultet, Beograd, 1997. 8. The Handbook of Logistics and Distribution Management: Understanding the Supply Chain Fifth Edition, 2006.

Course code: **13-14-15-3TRTES020203**	**Course title:** **TRANSPORT NETWORKS IN ROAD TRAFFIC**		
Level: II	**Year: II**	**Semester: III**	**Number of ECTS credites: 6**
Status: Elective Course		**Total number of contact hours: 105** Optional breakdown of hours by type: Lectures 30 Tutorials 30 Laboratory tutorials Seminars 15 Independent work 30	

Course participants:	**Academic staff and associates selected in the field to which the course belongs/course**
Prerequisite for enrollment:	None
Course goal (goals):	Acquisition of educational methods in the implementation of programs related to transport network in road traffic. Gaining knowledge and skills in transport network for road traffic.
Topics covered (Units of study): *(if necessary, the weekly implementation plan is established taking into account the specificities of organizational units)*	1. Basics of Planning in Networks and Network Planning 2. Requirements and Capacities in Transport, Traffic, and Communication Networks 3. Service Provision in Traffic, Transport, and Communication Networks 4. Network Optimization Methods for Road Networks 5. Transport Optimization Methods on Road Networks 6. Real Systems and Road Networks 7. Basics of Simulation Methods in Network Analysis
Learning outcomes:	Through lectures, tutorials and practical work, students should acquire the necessary knowledge related to network in traffic and communications. Study and practical application should ensure that students achieve the required level of knowledge to successfully plan, organize and manage processes in transport, traffic and communications on network for specific types of traffic and transport.
Sustainable Development Goal (SDG):	– SDG4: Ensure inclusive and quality education, and promote lifelong learning opportunities for all people, of all ages – SDG9: Industry, Innovation, and Infrastructure – SDG11: Sustainable Cities and Communities – SDG12: Responsible Consumption and Production – SDG13: Climate Action
Teaching methods:	Lectures, tutorials and preparation of seminars with a practical focus. Analytical and demonstrative approach.
Assessment methods with	Student performance is monitored by assigning points for each

grading structure:	form of activity and knowledge assessment during the semester, as well as on the final exam after the end of the semester according to the following monitoring elements: – Homework/Seminar Paper/Practical Work: 15 points (%), evaluated if more than 50% is achieved – First Partial Exam/First Test/First Knowledge Check: 35 points (%), evaluated if more than 50% is achieved – Final Exam (Second Partial): 50 points (%), evaluated if more than 50% is achieved – Final Exam (Comprehensive): 85 points (%), evaluated if more than 50% is achieved The total number of points (%) that a student can achieve through the aforementioned monitoring during classes is a maximum of 50 points (%), which, combined with the Final (Second Partial) Exam, totals 100 points (%). For students who did not pass the First Partial Exam, the Final Exam (Comprehensive) covers all the material covered during classes and exercises and is worth 85 points (%), which, combined with the seminar paper/practical work, totals 100 points (%). The final success of students after all the prescribed forms of knowledge assessment is evaluated and graded according to the following grading system: a) 10 (A) - Outstanding performance with no errors or only minor errors, earns 95-100 points b) 9 (B) - Above average, with some errors, earns 85-94.99 points c) 8 (C) - Average, with noticeable errors, earns 75-84.99 points d) 7 (D) - Generally good, but with significant shortcomings, earns 65-74.99 points e) 6 (E) - Meets the minimum requirements, earns 55-64.99 points f) 5 (F, FX) - Does not meet the minimum requirements, less than 55 points.
Literature:	Mandatory: 1. Mehanović, M., 2015. „Mreže u saobraćaju, prevozu i komunikacijama“. Fakultet za saobraćaj i komunikacije u Sarajevu, Sarajevo. 2. Sinković, V.: Informacijske mreže, Školska knjiga Zagreb, Zagreb, 1994. Supplementary: 1. Teodorović, D.: Transportne mreže, Savez inženjera i tehničara saobraćaja i veza Jugoslavije, Beograd, 1983. 2. Suruliz, K., Hadžialić, M., Statistička teorija telekomunikacija, Univerzitetski udžbenik, Elektrotehnički fakultet Sarajevo, 2009. 3. HCM2000; Capacity Manual, Special Report 209, Transportation Research Board, Washington D.C., 1994.

Course code: **13-14-15-4TRTES020203**	**Course title:** **METHODOLOGY OF SCIENTIFIC AND SCHOLARLY RESEARCH**		
Level: II	**Year: II**	**Semester: III**	**Number of ECTS credits: 6**
Status: Elective Course		**Total number of contact hours: 90** Lectures: 45 hours Exercises: 30 hours	

	Seminars and Project Tasks: 15 hours
Course participants:	**Academic staff and associates selected in the field to which the course belongs/course**
Prerequisite for enrollment:	None
Course goal (goals):	Through lectures, exercises, seminar work, and practical assignments, students should acquire the necessary basic and additional knowledge in the field of scientific and professional research methodology. The course "Methodology of Research and Scientific Work" aims to provide a comprehensive understanding of all principles, methods, objectives, and instruments of research and scientific work, as well as the process of defining and implementing the creation of scientific and professional papers.
Topics covered (Units of study): *(if necessary, the weekly implementation plan is established taking into account the specificities of organizational units)*	1. Introduction to the Methodology of Research Work. The function of research work. 2. Science of Sciences. Definition of science. 3. Basic characteristics of science. 4. Functions of science – research work: Fundamental research. 5. Applied research. Developmental research. Individual and team research. 6. Basic research methods. 7. Classification and selection of methods. 8. Technology of research work, identifying the research problem, and its function. 9. Selection and analysis of the topic. 10. Compiling a working bibliography: manuals, encyclopedias, dictionaries, monographs. 11. How to define the subject and objective of research? 12. What is a research result, and how is it verified? 13. Writing and presenting research work reports. 14. Concept, introduction, problem statement, argumentation, and discussion of results. 15. Writing the choice of research method. 16. Writing master's theses.
Learning outcomes:	Knowledge: Theoretical and practical knowledge in the field of scientific and research activities. The course should ensure a level of competence and knowledge necessary to address everyday problems in this field. Skills: Ability to apply theoretical and practical knowledge in the field of scientific and research activities. Competencies: Ability to independently understand and utilize knowledge needed to solve specific problems in the field of scientific and research activities.
Sustainable Development Goal (SDG):	SDG4 – "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all"; SDG5 – "Achieve gender equality and empower all women and girls"; SDG9 – "Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation."
Teaching methods:	The course is delivered through lectures, exercises, laboratory exercises/fieldwork/practice. The following methods are employed: oral presentation, discussion, demonstration, graphic work, drawing, and group work. Lectures cover theoretical concepts and principles, including descriptive

	examples and the resolution of specific tasks. Additional examples are discussed and solved through exercises, laboratory work/fieldwork/practice, facilitating continuous work and preparation for independent problem-solving. In laboratory exercises/fieldwork/practice, skills needed for both individual and team tasks are developed to address assignments within the given field.
Assessment methods with grading structure:	Evaluation of Creativity in Class and Exercises, Including Independent Work, Partial Test Assessment During Classes, and Final Exam Assessment. The criteria for tracking student performance and grading during classes are as follows: – Homework/Seminar Paper/Practical Work: 15 points (%), passed if more than 50% is achieved. – First Partial Exam/Test/Knowledge Check: 35 points (%), passed if more than 50% is achieved. – Final Exam (Second Partial Exam): 50 points (%), passed if more than 50% is achieved. – Final Exam (Comprehensive): 85 points (%), passed if more than 50% is achieved. The total number of points (%) a student can achieve through class participation and assessments is a maximum of 50 points (%), which, combined with the Final Exam (Second Partial), totals 100 points (%). For students who did not pass the First Partial Exam, the Final Exam (Comprehensive) is organized for all covered material during classes and exercises and is valued at 85 points (%), combined with the seminar paper/practical work for a total of 100 points (%). The final student success, after all the foreseen forms of knowledge assessment, is evaluated and graded according to the following system: – 10 (A) - Outstanding performance with no or minor errors, worth 95-100 points. – 9 (B) - Above average, with some errors, worth 85-94 points. – 8 (C) - Average, with noticeable errors, worth 75-84 points. – 7 (D) - Generally good, but with significant shortcomings, worth 65-74 points. – 6 (E) - Meets minimum criteria, worth 55-64 points. – 5 (F, FX) - Does not meet minimum criteria, less than 55 points. Total Assessment of All Student Obligations During the Semester, or Exam Grade Based on the Total Number of Points (%): – Attendance at Lectures and Exercises: - – Homework/Seminar/Practical Work: 10 points (%) – Workshop: 5 points (%) – First Partial Exam/Test/Knowledge Check: 35 points (%) – Final Exam (Second Partial): 50 points (%) – Final Exam (Comprehensive): 85 points (%)
Literature:	Mandatory: 1. Š. Čekić: Osnovi metodologije i tehnologije izrade znanstvenog istručnog djela, Fakultet za saobraćaj i komunikacije, Sarajevo,1999 2. S. Dubić: Uvođenje u naučni rad, Zavod za izdavanje udžbenika,Sarajevo 1970. 3. M.Šamić: Kako nastaje naučno djelo, Svjetlost, Sarajevo,1980. 4. M.Vujović: Uvođenje u znanstveni rad, Informator, Zagreb, 1983 6. M. Filipović: Metodologija znanosti i znanstvenog

	rada,Svjetlost,Sarajevo 2004. 7. V. Silubrčić: Kako sastaviti, obajaviti i ocjeniti znanstveno djelo,Zagreb, 2003. 8. L. Kuba – Dž. Koking: Metodologija izrade naučnog teksta, CID;Podgorica,2004. 9. S. Kukić: Metodologija znanstveno istraživačkog rada,Ekonomski Fakultet, Mostar 2005.

Course code: **13-14-15-5TRTES020203**	**Course title:** **TRAFFIC POLICY**		
Level: II	**Year: II**	**Semester: III**	**Number of ECTS credits: 6**
Status: Elective Course		**Total number of contact hours: 90** Optional breakdown of hours by type: Lectures: 45 Tutorials: 30 Seminars and project tasks: 15	
Course participants:	**Academic staff and associates selected in the field to which the course belongs/course**		
Prerequisite for enrollment:	None		
Course goal (goals):	Students acquire the basic theoretical knowledge necessary for the study of transport policy: the national importance of the transport system and its integration into European traffic flows, the allocation of positive and negative effects of the integration of transport policy. Pyramidal structure and authority when defining and implementing traffic priorities at the national and international level.		
Topics covered (Units of study): *(if necessary, the weekly implementation plan is established taking into account the specificities of organizational units)*	1. Approaches to the national transport policy: the concept of politics, types of policies, the function of politics as an approach to the national transport policy, 2. National transport policy components: Transport policy holders, transport policy objectives, transport policy instruments, relationship between transport policy objectives and instruments, 3. Principles of the national transport policy - Part I: the connection between transport and the economy, coordination of the operation of the transport system and social profitability. 4. Principles of national transport policy - Part II: Principles of a unified transport system, allocation of resources, ownership and equal work opportunities, choice of transport policy and feasibility of transport policy 5. Formulation of transport policy: Formulation, evaluation, efficiency of national transport policy. The concept and meaning of determinants of transport policy. 6. Harmonization of transport policy – Part I: Objectives of common transport policy. General political guidelines of the common transport policy. 7. Harmonization of transport policy – Part II: Application and discussions on the future of transport within the framework of the common transport policy. 8. Trans-European transport network – Part I: Guidelines from 1996 and revision of the guidelines for the trans-European transport network from 2004. 9. Trans-European transport network – Part II: Revision of the 2013 guidelines: integrated network, two-layer structure and corridors of		

	the trans-European transport network. 10. Trans-European transport network – Part III: Additional funding opportunities for trans-European network projects. Determination of general conditions for financing projects of trans-European networks. 11. Trans-European transport network - Part IV: Instrument and general objectives for connecting Europe with the trans-European network. Budget of the Instrument for Connecting Europe with the Trans-European Network 12. Sectoral policies of the EU - Part I: Objective and scope of application of Directive 97/67/EC of the European Parliament and of the Council. Universal postal services. 13. EU sectoral policies – Part II: Harmonization of bookable postal services. Conditions for providing non-reserved postal services and access to the network. 14. Sectoral policies of the EU – Part III: Quality of postal services. Harmonization of technical standards according to the interests of users. Board and National Regulatory Authority 15. Sectoral policies of the EU - Part IV: Market rules of postal traffic and European achievements in the field of postal traffic.
Learning outcomes:	Knowledge: The ability to create and apply traffic policy respecting the set objectives. Skills: Identification of traffic and transport priorities necessary for strategic planning and creation of traffic policy in the micro and macro environment. Define traffic policy goals and acceptable implementation models. Identifies priorities in the area of planning, construction, revitalization of traffic flows, assesses the need for integration and liberalization of internal traffic flows following European and international traffic policy, directives and guidelines as well as traffic flows, but also traffic flows and policies of neighboring countries. Competencies: Creation of internal efficient and effective transport system and integration into international and EU transport systems
Sustainable Development Goal (SDG):	Goals of sustainable development and impact on traffic policy: 1. SDG 1 - A world without poverty 2. SDG 2 - A world without hunger 3. SDG 5 – Gender equality 4. SDG 6 – Clean water and sanitation 5. SDG 7 – Affordable energy from clean sources 6. SDG 8 - Decent work and economic growth 7. SDG 9 – Industry, innovation and infrastructure 8. SDG 10 – Reducing inequality 9. SDG 11 – Sustainable cities and communities 10. SDG 12 - Sustainable consumption and production 11. SDG 13 – Climate protection 12. SDG 14 – Conservation of the aquatic world 13. SDG 15 – Preservation of life on earth 14. SDG 16 – Peace, justice and strong institutions 15. SDG 17 – Partnership to the goal
Teaching methods:	The teaching is realized through lectures, exercises and the practical part of the teaching, which includes the creation of project tasks. Lectures are conducted through oral presentation with presentation and presentation of examples from practice. It initiates a discussion on the problems of planning, modeling and analysis of information systems. Students will be required to create and present seminar papers and/or project

	assignments. Different methods are used in teaching, including: oral presentations and discussions, demonstration of examples, methods of graphic and video presentations and strengthening of work in groups using appropriate methodological approaches.
Assessment methods with grading structure:	The criteria for evaluating the student's work and evaluation during classes is as follows: Activity (seminar paper / project assignment): from 0 to 15 points; 1st test / 1st knowledge test / 1st partial exam: from 0 to 35 points. The total number of points that a student can earn during classes is a maximum of 50 points. The final/remedial exam includes the material that the student did not pass on the partial exam, which means that it includes the second part of the material (II partial) which is evaluated with 50 points or consists of the complete material, i.e. I and II partial exam. The total evaluation of all the student's obligations during the semester, i.e. the grade on the exam, is based on the total number of points (%) that the student earned by fulfilling the pre-exam obligations, passing the partial and final exams. According to the quality of acquired knowledge and skills, a student can win a maximum of 100 points, and according to the following scale: Scoring structure: Points (%) Seminar / Project task:..... 15 points (%) 1st test / 1st knowledge test (1st partial exam..... 35 points (%) Final or remedial exam (II partial exam):..... 50 points (%) The required condition for successfully completing the exam is a score of 55 points, where a minimum of 55% must be achieved in each part of the exam (activity, partial exam, final exam), i.e. in order to pass the exam, the student must meet the following conditions: – Activity (seminar paper / project assignment): 9 points – 1st test / 1st knowledge test / partial exam: 19 points – Final or remedial exam (II partial exam): 27 points Students who passed the partial exam take only the second part of the material (the part that is not included in the partial exam) on the final/remedial exam. Students who did not pass the partial exam take the complete material as part of the final/remedial exam, while the criteria for passing the exam remain identical. The final / make-up exam is organized as written and/or oral. The activity can be followed through the creation of homework, seminar papers, project tasks or taking quizzes. The final success of the student, after all the foreseen forms of knowledge verification, is evaluated and graded by the grading system as follows: a) 10 - exceptional success without errors or with minor errors, carries 95-100 points; b) 9 - above average, with some errors, carries 85-94 points; c) 8 - average, with noticeable errors, carries 75-84 points; d) 7 - generally good, but with significant shortcomings, carries 65-74 points; e) 6 - meets the minimum requirements, carries 55-64 points; f) 5 - does not meet the minimum requirements, less than 55 points. The above scale can be adjusted according to the Rules of studying at the University of Sarajevo (Article 45).
Literature:	Mandatory: 1. Juraj Padjen, Traffic policy of Croatia, Masmedia, Zagreb, 2003. 2. Piero Soave, "A brief guide to the European Union", European Parliament, October 2016. 3. Marc Thomas, "A Brief Guide to the European Union", European Parliament, September 2016.

	4. Beata Tuszynska and Frederic Gouarderes, "A Brief Guide to the European Union", European Parliament, October 2016. Supplementary: 1. Directive 97/67/EC OF THE EUROPEAN PARLIAMENT AND COUNCIL OF 15.12.1997. year, "Official Gazette of the European Communities" no. 6/St. 9 of 21.01.1998. year. 2. Directive 2002/39/EC OF THE EUROPEAN PARLIAMENT AND COUNCIL OF 10.06.2002. year, "Official Gazette of the European Communities" no. 6/St. 1 of 05.07.2002. year. 3. Directive 2008/6/EC OF THE EUROPEAN PARLIAMENT AND COUNCIL dated February 20, 2008. on the amendment and Directive 97/67/EC regarding the complete achievement of the internal market of postal services in the Community, "Official Gazette of the European Communities" no. 06/St. 9 of 27.02.2008. year. 4. Directive 2008-68-EZ OF THE EUROPEAN PARLIAMENT AND COUNCIL dated September 24, 2008. "Official Gazette EU 7/Vol. 7" Land transport of controlled substances. 5. Directive 2010/40EU OF THE EUROPEAN PARLIAMENT AND COUNCIL dated 07.07.2010. "Official Gazette of the EU 7/Vol.8" Framework for the introduction of intelligent transport systems in road transport and for connections with other types of transport. 6. DIRECTIVE 2004/54/EC OF THE EUROPEAN PARLIAMENT AND COUNCIL 7 of April 29, 2004 on minimum safety requirements for tunnels in the trans-European road network 7. "DIRECTIVE 2008/96/EC OF THE EUROPEAN PARLIAMENT AND COUNCIL of November 19, 2008 on road infrastructure safety management 8. DIRECTIVE 2009/33/EC OF THE EUROPEAN PARLIAMENT AND COUNCIL of April 23, 2009 on the promotion of clean and energy-efficient vehicles in road transport 9. DIRECTIVE 1999/62/EC OF THE EUROPEAN PARLIAMENT AND COUNCIL of June 17, 1999 on charges for the use of certain infrastructures for heavy goods vehicles 10. DIRECTIVE 2004/52/EC OF THE EUROPEAN PARLIAMENT AND COUNCIL of April 29, 2004 on the interoperability of electronic toll collection systems in the Community 11. DIRECTIVE (EU) 2019/520 OF THE EUROPEAN PARLIAMENT AND COUNCIL of March 19, 2019 on the interoperability of electronic toll collection systems and facilitating the cross-border exchange of information on non-payment of tolls in the Union 12. REGULATION (EC) no. 1072/2009 OF THE EUROPEAN PARLIAMENT AND COUNCIL of October 21, 2009 on common rules for access to the international road freight transport market 13. REGULATION (EC) no. 561/2006 OF THE EUROPEAN PARLIAMENT AND COUNCIL of March 15, 2006 on the harmonization of certain social legislation related to road transport and on the amendment of Council Regulation (EEC) no. 3821/85 and (EC) no. 2135/98 and repealing Council Regulation (EEC) no. 3820/85 14. DIRECTIVE 2002/39/EC OF THE EUROPEAN PARLIAMENT AND COUNCIL of June 10, 2002 amending Directive 97/67/EC regarding the further opening of the postal services market in the Community

	15. DIRECTIVE 2008/6/EC OF THE EUROPEAN PARLIAMENT AND COUNCIL of 20 February 2008 amending Directive 97/67/EC with regard to the full achievement of the internal market for postal services in the Community. 16. REGULATION (EU) no. 952/2013 OF THE EUROPEAN PARLIAMENT AND COUNCIL of October 9, 2013 on the Customs Code of the Union. 17. REGULATION (EU) 2018/644 OF THE EUROPEAN PARLIAMENT AND COUNCIL of April 18, 2018 on cross-border package delivery services 18. DIRECTIVE (EU) 2019/789 OF THE EUROPEAN PARLIAMENT AND COUNCIL of April 17, 2019 on establishing rules on the exercise of copyright and related rights that apply to certain internet transmissions by organizations for broadcasting and rebroadcasting of television and radio programs and on amending the Council Directive 93/83/EEC 19. REGULATION (EU) 2015/2120 OF THE EUROPEAN PARLIAMENT AND COUNCIL of November 25, 2015 on establishing measures related to open Internet access and amending Directive 2002/22/EC on universal service and user rights in connection with electronic communications networks and services and Regulation (EU) no. 531/2012 on roaming in public mobile communication networks in the Union. 20. REGULATION (EU) 2018/1971 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2018 on the establishment of the Body of European Regulators for Electronic Communications (BEREC) and the BEREC Support Agency (BEREC Office), amending Regulation (EU) 2015 /2120 and repealing Regulation (EC) no. 1211/2009 21. REGULATION (EU) 2019/1150 OF THE EUROPEAN PARLIAMENT AND COUNCIL of June 20, 2019 on promoting fairness and transparency for business users of online mediation services 22. REGULATION (EC) no. 549/2004 OF THE EUROPEAN PARLIAMENT AND COUNCIL of March 10, 2004 on establishing the framework for the creation of a single European sky 23. REGULATION (EC) no. 550/2004 OF THE EUROPEAN PARLIAMENT AND COUNCIL of March 10, 2004 on the provision of air navigation services in the single European sky 24. REGULATION (EC) no. 552/2004 OF THE EUROPEAN PARLIAMENT AND COUNCIL of 10 March 2004 on the interoperability of the European air traffic management network 25. REGULATION (EU) 2019/712 OF THE EUROPEAN PARLIAMENT AND COUNCIL of April 17, 2019 on the protection of market competition in the air 26. DIRECTIVE 2012/34/EU OF THE EUROPEAN PARLIAMENT AND COUNCIL of 21 November 2012 on the establishment of a single European railway proctor 27. DIRECTIVE (EU) 2016/797 OF THE EUROPEAN PARLIAMENT AND COUNCIL of 11 May 2016 on the interoperability of the railway system in the European Union 28. DIRECTIVE (EU) 2016/798 OF THE EUROPEAN PARLIAMENT AND COUNCIL of May 11, 2016 on railway safety, 29. REGULATION (EU) 2016/796 OF THE EUROPEAN

	PARLIAMENT AND COUNCIL of May 11, 2016 on the European Union Agency for Railways and repealing Regulation (EC) no. 881/2004 30. REGULATION (EC) no. 1371/2007 OF THE EUROPEAN PARLIAMENT AND COUNCIL31 of October 23, 2007 on the rights and obligations of passengers in rail traffic 31. Notes and slides from lectures (can be downloaded from the official website of the Faculty of Traffic and Communications and distributed electronically to each individual student)

Course code: **13-14-15-6TRTES020203**	**Course title:** **GEOGRAPHIC INFORMATION SYSTEMS**		
Level: II	**Year: I**	**Semester: I**	**Number of ECTS credits: 6**
Status: Mandatory Course		**Total number of contact hours: 90** Lectures: 45; Practical Exercises: 30; Seminars and Project Tasks: 15	
Course participants:	**Academic staff and associates selected in the field to which the course belongs/course**		
Prerequisite for enrollment:	None		
Course goal (goals):	Familiarizing students with the fundamental concepts of GIS systems, their operational methods, planning, implementation, and potential applications.		
Topics covered (Units of study): *(if necessary, the weekly implementation plan is established taking into account the specificities of organizational units)*	1. The concept of Geographic Information Systems (GIS) 2. Components of GIS 3. The process of collecting and manipulating GIS data 4. Structure and models of spatial data 5. Database management 6. Coordinate systems, projections, georeferencing 7. Geographic data bases 8. Standardization in GIS 9. Output data and cartography 10. Techniques for graphical representation 11. Principles of layered representation of spatial data 12. Areas of application and basic GIS functions 13. Web and mobile GIS 14. Application of GIS in telecommunications infrastructure planning 15. Application of GIS in transportation infrastructure planning		
Learning outcomes:	Knowledge: Students will become familiar with the fundamental concepts of GIS development and standardization, the principles of web and mobile GIS systems, and their specific applications with a particular focus on transportation and communications. They will learn about the process of developing GIS systems, from the initial idea and need for GIS, through data collection and formation of GIS databases, to georeferencing, graphical representation, and the use of GIS systems. Skills: Students will acquire proficiency in specific software tools needed for designing and developing GIS systems. Competencies: After passing the exam, students will be capable of planning, designing, and developing GIS systems, and selecting appropriate technologies for developing specific solutions.		
Sustainable Development Goal (SDG):	SDG 9 – Industry, Innovation, and Infrastructure SDG 11 – Sustainable Cities and Communities		
Teaching methods:	The course is delivered through lectures, practical exercises, and hands-		

	on laboratory work. Lectures are conducted through oral presentations with slides and practical examples. Exercises and laboratory work involve the use of software tools to address specific problems and practical tasks. Students will be required to prepare and present seminar papers and/or project tasks. Various methods are employed during the course, including oral presentations, discussions, demonstrations, individual and group work, etc.
Assessment methods with grading structure:	Grading and Evaluation: The total number of points a student can earn during the course is 50, with another 50 points available in the final exam. The points for the course are distributed among assignments and activities and/or seminar papers and/or project tasks, and the partial exam. The final/re-sit exam covers material not included in the partial exam, meaning it includes the second part of the material worth 50 points for students who have passed the partial exam. Students who have not passed the material covered in the partial exam will take the material from both the partial and final exams. The final/re-sit exam will be organized as a written and/or oral exam, including a practical component. The overall evaluation of all student obligations during the semester, including the exam grade, is based on the total number of points earned from fulfilling pre-exam obligations, the partial exam, and the final exam. Based on the quality of acquired knowledge and skills, a student can earn a maximum of 100 points, according to the following scale: Grading Structure: – Seminar / Class Participation / Project Task: 20 points (20%) – First Test / First Knowledge Check (Partial Exam): 30 points (30%) – Final or Re-sit Exam (Second Partial Exam): 50 points (50%) Passing Criteria: To pass, a student must earn at least 55 points in total and achieve at least 55% of the points on the knowledge checks (partial exam and final/re-sit exam). Final Grade System: After all forms of knowledge assessment, the student's performance is evaluated and graded as follows: a) 10 - Excellent performance with no errors or minimal errors (95-100 points) b) 9 - Above average, with a few errors (85-94 points) c) 8 - Average, with noticeable errors (75-84 points) d) 7 - Generally good, but with significant deficiencies (65-74 points) e) 6 - Meets minimum requirements (55-64 points) f) 5 - Does not meet minimum requirements (less than 55 points)
Literature:	Mandatory: 1. Alem Čolaković, "Geographic Information Systems (LECTURE NOTES)," Faculty of Traffic and Communications, Sarajevo, 2023. Supplementary: 1. Kang Tsung Chang, „*Introduction to Geographic Information Systems*“, McGraw-Hill Education, 2019. 2. Paul Bolstad, „*GIS Fundamentals A First Text on Geographic Information Systems,*“ Eider Press, 2016. 3. Ian Heywood, Sarah Cornelius, „*An introduction to geographical information systems*“, Pearson Education Limited, 2006. 4. Kurt Menke, Richard Smith Jr., Luigi Pirelli, John Van Hoesen, „*Mastering QGIS*“,“ Packt Publishing Ltd., 2016. 5. Gábor Farkas, „Practical GIS,“ Packt Publishing Ltd., 2017. 6. Anita Graser, „*Learning QGIS*,“ Packt Publishing Ltd., 2016.

	7. Ralph M. Stair, George W. Reynolds, „*Fundamentals of Information Systems*," Cengage Learning, 2016. 8. Alan Dennis, Barbara Haley Wixom, Roberta M. Roth, „*Systems analysis and design*," Wiley, 2015. 9. Patricia Wallace, „*Introduction to Information Systems*," Pearson Education, 2015. 10. Arthur M. Langer, „*Analysis and Design of Information Systems, Springer-Verlag*," 2008. 11. John Wang, „*Innovations in Supply Chain Management for Information Systems*," Business Science Reference, 2010. 12. Christos Kalloniatis: "*Modern Information Systems*," InTech Croatia, 2012.

Course code: **13-14-15-7TRTES020203**	**Course title:** **SOFTWARE TOOLS FOR SIMULATION AND ANALYSIS OF ROAD TRAFFIC**		
Level: II	**Year: II**	**Semester: III**	**Number of ECTS credits: 6**
Status: Elective Course		**Total number of contact hours: 90** Optional breakdown of hours by type: Lectures 30 Tutorials 20 Seminars 10 Fieldwork 10 Laboratory Tutorials 10 Practice 10	
Course participants:	**Academic staff and associates selected in the field to which the course belongs/course**		
Prerequisite for enrollment:	None		
Course goal (goals):	To acquire knowledge and develop skills through practical use of software tools designed for research, analysis, simulation, project solution development, and process management in road traffic.		
Topics covered (Units of study): *(if necessary, the weekly implementation plan is established taking into account the specificities of organizational units)*	1. Research process and analysis in road traffic for creating adequate project tasks and solutions. 2. Importance and application possibilities of software tools in road traffic. 3. Project documentation, plans, projects, and project solutions. 4. Application of software tools in the planning process in road traffic. 5. Application of software tools in the design process in road traffic. 6. Application of software tools in the organization process in road traffic. 7. Application of software tools in the management process in road traffic. 8. Application of software tools in road traffic safety. 9. Application of software tools in the environmental impact of road traffic. 10. Application of software tools in the design of traffic signs. 11. Application of software tools in road traffic education. 12. Application of software tools in traffic accident analysis. 13. Application of software tools in vehicle performance research. 14. Application of software tools in driver behaviour research. 15. Application of software tools in road characteristic research.		
Learning outcomes:	Knowledge: Practical application of software tools designed for		

	research, analysis, simulation, project solution development, and process management in road traffic. Skills: Ability to apply practical knowledge necessary for the adequate use of software tools designed for research, analysis, simulation, project solution development, and process management in road traffic. Competencies: Ability to independently understand and apply regulations, use professional literature, apply methods and procedures, conduct measurements and research, perform analyses, assessments, and practical solutions, engage in preventive action, and use procedures necessary for applying software tools designed for research, analysis, simulation, project solution development, and process management in road traffic.
Sustainable Development Goal (SDG):	SDG4 – Quality Education SDG5 - Gender Equality SDG8 - Decent Work and Economic Growth SDG9- Industry, Innovation and Infrastructure SDG11 - Sustainable Cities and Local Communities SDG12-Sustainable consumption and production SDG13-Climate Action SDG17- Partnerships for the Goals
Teaching methods:	Oral presentations with demonstrations of various software tools designed for research, analysis, simulation, project solution development, and process management in road traffic, using software, measurement equipment, as well as independent work and presentation of specific research. Initiating discussions and debates on practical problems, individual observations from different environments, and conducting independent analyses designed for research, analysis, simulation, project solution development, and process management in road traffic.
Assessment methods with grading structure:	Assessment of creativity in classes and exercises with the preparation of independent papers, evaluation of the partial test during the class as well as the evaluation of the final exam. The criterion for monitoring the work and evaluation of the student while the course is as follows: – Seminar 15 points (%), passed if won over 50%. – I Partial exam/test/knowledge test/35 points (%), is passed if more than 50% is scored. – Final exam (II Partial) 50 points (%), passed if won over 50%. – Final exam (Integral) 85 points (%), passed if won over 50%. The total number of points (%) that a student can achieve during the course is a maximum of 50 points (%), which together with the Final (II partial) makes 100 points (%). For students who have not passed the I Partial Exam, the Final Exam (Integral) is organized from the entire material covered during classes and exercises, and is evaluated with 85 points (%), which with the seminar paper/practical work makes 100 points (%). The final success of the student after all the foreseen forms of examination is evaluated and evaluated by the grading system as follows: a) 10 (A) - exceptional success without errors or with minor errors, carries 95-100 points; b) 9 (B) - above average, with some error, carries 85-94 points; c) 8 (C) - average, with noticeable errors, carries 75-84 points; d) 7 (D) - generally good, but with more significant drawbacks, carries 65-74 points; e) 6 (E) - meets the minimum requirements, carries 55-64 points; f) 5 (F, FX) - does not meet the minimum requirements, less than 55 points.

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<td>Literature:</td>
<td>Mandatory:

O. Lindov, A. Omerhodzic: Software Tools for Preparing Accident Reports and Analysis. Professional Consultation: Traffic-Technical Expertise as a Basis for Quality Resolution of Court Disputes, Skopje, 2019.
O. Lindov, A. Omerhodžić: Elements of Traffic Accident Expertise (Lecture and Exercise Notes), Faculty of Traffic and Communications, University of Sarajevo, Sarajevo, 2018.
E.J. Braude, M.E. Bernstein: Software Engineering – Modern Approaches, 2nd Edition. Waveland Press, Long Grove IL, 2016.
F. Tsui, O. Karam, B. Bernal: Essentials of Software Engineering, 4th Edition. Jones & Bartlett Publishers, Sudbury MA, 2016.
H. Van Vliet: Software Engineering - Principles and Practice, 3rd Edition. John Wiley and Sons, Chichester UK, 2008.
I. Sommerville: Software Engineering, 10th Edition. Pearson Education Inc, Boston MA, USA, 2016.
R.S. Pressman, B.R. Maxim: Software Engineering - A Practitioner's Approach, 8th Edition. McGraw-Hill, New York, 2014.
R. Stephens: Beginning Software Engineering. John Wiley and Sons, Indianapolis IN, USA, 2015.
O. Lindov, A. Omerhodzic: Practical Test of Software Applications Validity for the Analysis of Motor Vehicle-Pedestrian Collisions. Suvremeni Promet-Modern Traffic. 2013;33(1-2).
S.L. Pfleeger, J.M. Atlee: Software Engineering - Theory and Practice, 4th Edition. Pearson Education Inc, Boston MA, USA, 2013.
S.R. Schach: Object-Oriented and Classical Software Engineering, 8th Edition. McGraw-Hill, New York, 2010.
Standards and regulations in the field of road traffic design, planning, and safety.
Instructions and examples for the use of software tools (Vissim, Visum, QGIS, Plateia, Capusao, EES catalog, Audatex, Copert, Sound Plan, PutokazCAD, Driver simulator, Virtual Crash, Akcel, Track IR, Eye tracking, Torus, Retroreflectometer software).

Supplementary:</td>
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	1. O. Lindov et al., Road Safety Manual, Association of Traffic Engineers and Communications in Bosnia and Herzegovina, Sarajevo, 2018. 2. Lindov, O., Road Traffic Safety, Faculty of Traffic and Communications Sarajevo, 2007. 3. Road Safety Engineering - The Essentials: An Outline of the Road Safety Engineering Profession and What It Can Achieve for CAREC Roads, Phillip Jordan, ADB CAREC Road Safety Engineer. 4. ISO 9000:2005, Quality management systems — Fundamentals and vocabulary. 5. ISO 9001:2008, Quality management systems — Requirements. 6. ISO 14001:2004, Environmental management systems — Requirements with guidance for use. 7. ISO 14004:2004, Environmental management systems — General guidelines on principles, systems, and support techniques. 8. ISO 19011:2011, Guidelines for auditing management systems.

Course code: **13-14-15-8TRTES020203**	**Course title:** **ICT IN ROAD TRAFFIC**		
Level: II	**Year: II**	**Semester: III**	**Number of ECTS credits: 6**
Status: Mandatory Course		**Total number of contact hours: 90** Optional breakdown of hours by type: Lectures 45 Tutorials 30 Seminars 15	
Course participants:	**Academic staff and associates selected in the field to which the course belongs/course**		
Prerequisite for enrollment:	None		
Course goal (goals):	The objective of this course is to provide an overview of the application of information and communication technologies (ICT) in road traffic.		
Topics covered (Units of study): *(if necessary, the weekly implementation plan is established taking into account the specificities of organizational units)*	1. Concept and significance of traffic and communication systems 2. Basic characteristics of the transport substrate 3. Transport devices 4. Manipulative means and transport equipment 5. Humans as a component of the traffic and transport system 6. Basic concepts and functions of transport modes 7. Capacity and level of service of the transport system 8. Basic characteristics and challenges of mobility 9. Road transport mode 10. Railway transport mode 11. Air transport mode 12. Water transport mode 13. Pipeline transport mode 14. Postal and communication technologies 15. Information and communication technologies in transport		
Learning outcomes:	Knowledge: This course provides the necessary knowledge of information and communication technologies for data management processes and teaches the application of databases and modern communication technologies in support of transport processes. Skills: Students will acquire skills essential for planning, designing, and managing ICT in road traffic. Competencies: Through lectures, exercises, and seminar work, students		

	will develop competencies to analyze the functions of ICT systems in road traffic and to create services for informing passengers and drivers.
Sustainable Development Goal (SDG):	SDG 3 – Good Health and Well-being SDG 9 – Industry, Innovation, and Infrastructure SDG 11 – Sustainable Cities and Communities SDG 13 – Climate Action
Teaching methods:	Lectures, exercises, and seminar work.
Assessment methods with grading structure:	Attendance and seminar work: 15 points First knowledge assessment: 35 points Final knowledge assessment: 50 points
Literature:	Required: 1. Teaching materials available on the Faculty of Traffic and Communications' online learning platform Supplementary: 1. Ruimin Li and Zhengbing He: *Traffic Information and Control*, IET Transportation, London, 2021. 2. Marco Picone and Stefano Busanelli: *Advanced Technologies for Intelligent Transportation Systems*, Springer, London, 2015.

Course code: **13-14-15-9TRTES020203**	**Course title:** **ROAD SAFETY INSPECTION (RSI) AND ROAD SAFETY AUDIT (RSA)**		
Level: II	**Year: II**	**Semester: III**	**Number of ECTS credits: 6**
Status: Mandatory Course		**Total number of contact hours: 90** Optional breakdown of hours by type: Lectures 30 Tutorials 20 Seminars 10 Fieldwork 10 Laboratory Tutorials 10 Practice 10	
Course participants:	**Academic staff and associates selected in the field to which the course belongs/course**		
Prerequisite for enrollment:	None		
Course goal (goals):	Gain knowledge of the basics of processes, procedures, and techniques for implementing Road Safety Inspection (RSI) and Road Safety Audit (RSA).		
Topics covered (Units of study): *(if necessary, the weekly implementation plan is established taking into account the specificities of organizational units)*	1. Elements and stages of road safety audit (RSA) and road safety inspection (RSI). 2. Legal aspects and institutional-management aspects in the process of a road safety audit (RSA) and road safety inspection (RSI). 3. Analysis and introductions to E, regional and national manuals in the field of Road Safety Audit and Inspection. (RSA & RSI). 4. Databases and accident investigation and black spot management (BSM). 5. Principles of road safety design (road function, transverse profile, route, intersections, public and private roadside facilities, vulnerable road users, traffic signage, lighting, road belt characteristics, passive protection elements of road users). 6. Road Safety Audit Checklists (RSA) 7. Road Safety Inspection Checklists (RSI).		

	8. Preparation and implementation of the road project inspection project from the aspect of safety (RSA). 9. Preparation of road safety audit report (RSA). 10. Presentation and defense of road safety review report (RSA) 11. Preparation and implementation of the project of field tours of the road. 12. Preparation of road safety inspection (RSI) reports. 13. Presentation and defense of road safety inspection (RSI) report. 14. Analysis of road safety inspection (RSI) inspection practices. 15. Analysis of road safety project safety (RSA) practice examples.
Learning outcomes:	Knowledge: Theoretical relevant knowledge and experience for practical application in the field of road safety inspection (RSI) and road safety audit (RSA) processes, legal aspects, key stages and methods of implementation, roles and responsibilities of key entities in the process, and procedures and techniques for the implementation of the road safety inspection (RSA) and road safety audit (RSI) processes. Skills: Ability to apply theoretical and practical knowledge necessary for an adequate analysis of the road safety inspection (RSI) and road safety audit (RSA) processes, legal aspects, key stages and methods of implementation, roles and responsibilities of key entities in the process, and procedures and techniques for the implementation of the road safety inspection (RSA) and road safety audit (RSI) processes. Competencies: Ability to independently understand and use regulations, use professional literature, apply methods and procedures, measure and research, make analyses, assessments and practical solutions, take preventive action, and procedures necessary for adequate analysis of the road safety inspection (RSI) and road safety audit (RSA) processes.
Sustainable Development Goal (SDG):	SDG4 – Quality Education – To ensure inclusive and quality education, and to promote lifelong learning opportunities for all people, of all ages. SDG5 - Gender Equality - Achieve gender equality and empower all women and girls. SDG8 - Decent Work and Economic Growth - Promote inclusive and sustainable economic growth, employment and decent work for all. SDG9- Industry, Innovation and Infrastructure -Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation. SDG11 - Sustainable Cities and Local Communities - Make cities and settlements inclusive, safe, resilient and sustainable. SDG12-Sustainable consumption and production - Ensure sustainable forms of consumption and production. COR13-Climate Action - Take urgent action to combat climate change and its consequences SDG17- Partnerships for the Goals- Incorporating a Global Partnership for Sustainable Development
Teaching methods:	Oral presentation with presentation and presentation of various analyses, studies, models and methods in the field of road safety inspection (RSI) and road safety audit (RSA) processes, with the use of video and audio recordings, software, measuring equipment, and independent presentation of individual specific research. Initiating discussions and discussions on practical problems, individual observations from different environments, making independent analyses, research, measurements and modelling in the field of road safety inspection (RSI) and road safety audit (RSA) processes.
Assessment methods with	Assessment of creativity in classes and exercises with the preparation of

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– Seminar 15 points (%), passed if won over 50%.
– I Partial exam/test/knowledge test/35 points (%), is passed if more than 50% is scored.
– Final exam (II Partial) 50 points (%), passed if won over 50%.
– Final exam (Integral) 85 points (%), passed if won over 50%.
The total number of points (%) that a student can achieve during the course is a maximum of 50 points (%), which together with the Final (II partial) makes 100 points (%). For students who have not passed the I Partial Exam, the Final Exam (Integral) is organized from the entire material covered during classes and exercises, and is evaluated with 85 points (%), which with the seminar paper/practical work makes 100 points (%).
The final success of the student after all the foreseen forms of examination is evaluated and evaluated by the grading system as follows: a) 10 (A) - exceptional success without errors or with minor errors, carries 95-100 points; b) 9 (B) - above average, with some error, carries 85-94 points; c) 8 (C) - average, with noticeable errors, carries 75-84 points; d) 7 (D) - generally good, but with more significant drawbacks, carries 65-74 points; e) 6 (E) - meets the minimum requirements, carries 55-64 points; f) 5 (F, FX) - does not meet the minimum requirements, less than 55 points.
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<td>Literature:</td>
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2. Proposal for a Directive of the European Parliament and of the Council amending Directive 2008/96/EC on road infrastructure safety management, The European Parliament and the Council of the European Union, 2019
3. Road Safety Inspection Manual, Common problems – Shared solutions, South East Europe Transport Observatory (SEETO) & World Bank, 2016
4. Directive 2008/96/EC of the European Parliament and of the Council on Road Infrastructure Safety Management, The European Parliament and the Council of the European Union, 2008</td>
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</table>

	5. O. Lindov, et al, Stručni i pravni dio projektovanja, Udruženje inženjera saobraćaja i komunikacija u Bosni i Hercegovini, Sarajevo, 2013. 6. D. Jovanov, et al, Practical Guide for Road Safety Auditors and Inspectors, Automobile and Motorcycle Association of Serbia - Center for Motor Vehicles, Belgrade, 2018. 7. Road Safety Manual, PIARC - World Road Association, https://www.piarc.org/en/ 8. Lindov, O., Sigurnost u cestovnom saobraćaju, Fakultet za saobraćaj i komunikacije Sarajevo, 2007. Supplementary: 1. Road safety engineering -the essentials, An outline of the road safety engineering profession and what it can achieve for CAREC roads, Phillip Jordan, ADB CAREC Road Safety Engineer 2. ISO 9000:2005, Quality management systems — Fundamentals and vocabulary 3. ISO 9001:2008, Quality management systems — Requirements 4. ISO 14001:2004, Environmental management systems — Requirements with guidance for use 5. ISO 14004:2004, Environmental management systems — General guidelines on principles, systems and support techniques 6. ISO 19011:2011, Guidelines for auditing management systems 7. ISO/TS 16949, Quality management systems — Particular requirements for the application of ISO 9001:2008 for automotive production and relevant service part organizations 8. ISO 31000:2009, Risk Management — Principles and guidelines 9. OHSAS 18001:2007, Occupational health and safety management systems — Requirements 10. World Report on Road Traffic Injury Prevention by M. Peden, R. Scurfield, D. Sleet, D. Mohan, A.A. Hyder, E. Jarawan and C. Mathers Geneva, World Health Organization, 2004. Available at: www.who.int/violence_injury_prevention/publications/road_traffic/world_report/en/ 11. Global status report on road safety: time for action. Geneva, World Health Organization, 2009. Available at: WHO | Global status report on road safety 2009 12. Towards Zero: Ambitious Road Safety Targets and the Safe System Approach. Paris, OECD and International Traffic Forum. 2008 13. Implementing the Recommendations of the World Report on Road Traffic Injury Prevention Country Guidelines for the Conduct of Road Safety Management Capacity Reviews and the Specification of Lead Agency Reforms, Investment Strategies and Safe System Projects. Tony Bliss, Jeanne Breen World Bank Global Road Safety Facility, Washington DC. 2009.

Course code: **13-14-15-10TRTES020203**	**Course title:** **SUSTAINABLE URBAN MOBILITY**		
Level: II	**Year:** **II**	**Semester: III**	**Number of ECTS credits:** 6
Status: Elective course		**Total number of contact hours: 90** Optional breakdown of hours by type: Lectures 30 Tutorials 20 Seminars 10	

	Fieldwork 10 Laboratory Tutorials 10 Practice 10
Course participants:	**Academic staff and associates selected in the field to which the course belongs/course**
Prerequisite for enrollment:	No
Course goal (goals):	Acquiring knowledge and skills in creating sustainable urban mobility plans, including all segments of planning, design, implementation and evaluation and monitoring of sustainable development in urban areas.
Topics covered (Units of study): *(if necessary, the weekly implementation plan is established taking into account the specificities of organizational units)*	1. The concept of sustainable urban mobility 2. Strategic planning of sustainable urban mobility 3. Indicators of sustainable urban mobility 4. SUMP sustainable urban mobility plans 5. Steps of SUMP development 6. Infrastructure design as a function of sustainable urban mobility. 7. E mobility infrastructure 8. The concept of Carpooling and Ridesharing in the function of sustainable urban mobility 9. Smart cities, digitization and mobility 10. Sustainable logistics in urban areas 11. Air and noise quality and sustainable urban mobility 12. Smart mobility and sustainable urban mobility 13. Energy efficiency and sustainable urban mobility 14. EU standards and policies in the field of sustainable urban mobility 15. Assessment and methods of measuring the effectiveness of sustainable urban mobility measures
Learning outcomes:	Knowledge: Theoretically relevant knowledge and experience for practical application in the development of capabilities, understanding and practical application of innovative ways of urban mobility planning, planning and designing spaces with accessibility and availability of destinations and services. Skills: Ability to apply theoretical and practical knowledge necessary for an adequate analysis of the urban mobility planning process, legal aspects, key phases and methods of implementation, roles and responsibilities of key entities in the process, and procedures and techniques for the implementation of the urban mobility planning process. Competencies: Ability to independently understand and use regulations, use professional literature, apply methods and procedures, measure and research, make analyses, assessments and practical solutions, take preventive action, and procedures necessary for an adequate analysis of the urban mobility planning process.
Sustainable Development Goal (SDG):	SDG4 – Quality Education – To ensure inclusive and quality education, and to promote lifelong learning opportunities for all people, of all ages. SDG5 - Gender Equality - Achieve gender equality and empower all women and girls. SDG8 - Decent Work and Economic Growth - Promote inclusive and sustainable economic growth, employment and decent work for all. SDG9- Industry, Innovation and Infrastructure -Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation. SDG11 - Sustainable Cities and Local Communities - Make cities and settlements inclusive, safe, resilient and sustainable.

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<tr><td>Teaching methods:</td><td>Oral presentation with presentation and presentation of various analyses, studies, models and methods in the field of road safety inspection (RSI) and road safety audit (RSA) processes, with the use of video and audio recordings, software, measuring equipment, and independent presentation of individual specific research. Initiating discussions and discussions on practical problems, individual observations from different environments, making independent analyses, research, measurements and modelling in the field of road safety inspection (RSI) and road safety audit (RSA) processes.</td></tr>
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	Final exam (II partial) — 50 points (%) Final exam (Integral) — 85 points (%)
Literature:	Mandatory: 1. Dalkmann H., Brannigan C.: Transport and climate change, Modul 5e: Sustainable transport: A sourcebook for policy-makers in developing cities, Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH, Eschborn, Germany. 2007. 2. Gwilliam, K. (ed): Cities on the Move: A World Bank Urban Transport Strategy Review, Strategy Paper, Washington, DC: World Bank, 2001. 3. Lah, O.: Sustainable Urban Mobility Pathways, Wuppertal Institute for Climate, Environment and Energy & Climate Action Implementation Facility, Berlin, Germany, 2019. 4. Lindov O., Omerhodžić A., Bušić D.: Izazovi implementacije plana održive urbane mobilnosti za područje Sarajeva 2020-2025., Konferencija o urbanom planiranju i regionalnom razvoju, UKI BH, Sarajevo, 2020. 5. Lindov O., Omerhodžić A., Tatarević A., Džaferović S.: Redesign of Motorized and Non-motorized Transport in Cities and Sustainable Mobility, International Conference Towars a Human City, 2015. 6. Lindov O., Pikula B.: Electromobility models and sustainable urban development – Sarajevo case study, International Conference Towars a Human City, 2019. 7. Litman T.: Well Measured: Developing Indicators for Sustainable and Livable Transport Planning, 2011. 8. Mehinović H., Mujezin H., Lindov O.: Enhancing competitiveness and innovation in the green and smart mobility, International Conference Towars a Human City, 2019. 9. Mastilović A., Lindov O.: Urban sustainability and smart street lights case study Sarajevo, International Conference Towars a Human City, 2019. 10. Meyer, M.D. and E.J. Miller: Urban Transportation Planning: A Decision-Oriented Approach, New York: McGraw-Hill. 2000. 11. Manville M., Shoup D.: People, Parking, and Cities, *Journal of Urban Planning and Development*, American Society of Civil Engineers 131(4), 233-245., 2005. 12. Smjernice za razvoj i provedbu plana održive urbane mobilnosti, European Platform on Sustainable Mobility Pan, 2020, Croatian_sump_guidelines.pdf Supplementary: 1. Basarić, V.: Model upravljanja raspodelom putovanja na vidove prevoza u funkciji održivog razvoja, Doktorska disertacija, Fakultet tehničkih nauka, Univerzitet u Novom Sadu, 2010. 2. Basarić, V., Djoric V., Jevdjenic A., Jovic J.: Efficient Methodology for Assessment of Targets and Policy Measures for Sustainable Mobility Systems, International Journal of Sustainable Transportation, vol. 9 br. 3, str. 217-226., 2015. 3. Commission of the European Communities, Action Plan on Urban Mobility, Brussels, 30.9.2009. 4. Guidelines Developing and Implementing a Sustainable Urban Mobility Plan, Rupprecht Consult – Forschung und Beratung GmbH, 2011.

	5. Kaplanović, S., Mijailović, R.: Internalizacija eksternih troškova u funkciji obezbjeđenja održivog razvoja drumskog saobraćaja, Univerzitet u Beogradu, Ekonomski fakultet, Beograd, 2012. 6. Kaplanović S., Petrović J., Ivković I.: Ekonomski instrumenti u funkciji održivog razvoja drumskog saobraćaja, Istraživanja i projektovanja za privredu, Beograd, godina VII, broj 25, 17-22., 2009. 7. Zietsman J., Rilett L. R.: Sustainable Transportation: Conceptualization and Performance Measures, Report No. SWUTC/02/167403-1, Texas Transportation Institute, The Texas A&M University System College Station, Texas. 2002.

Course code: **13-14-15-11TRTES020203**	**Course title:** **IoT SOLUTIONS FOR THE ELECTRIC VEHICLE INDUSTRY**		
Level: II	**Year:** **II**	**Semester: III**	**Number of ECTS credits:** 6
Status: Elective course		**Total number of contact hours: 90** Optional breakdown of hours by type: Lectures 45 Tutorials 30 Laboratory tutorials 15	
Course participants:	**Academic staff and associates selected in the field to which the course belongs/course**		
Prerequisite for enrollment:	No		
Course goal (goals):	The objective of the course is to provide students with a thorough understanding of the role of Internet of Things (IoT) technologies in the context of the electric vehicle industry.		
Topics covered (Units of study): *(if necessary, the weekly implementation plan is established taking into account the specificities of organizational units)*	1. Fundamentals of Electric Vehicle Industry and the Role of IoT Technologies. 2. Sensors and Performance Monitoring for Electric Vehicles using IoT. 3. Remote Control and Diagnostics of Electric Vehicles via IoT. 4. Connecting Vehicles to Smart Charging Infrastructure through IoT. 5. IoT Solutions for Battery Life Optimization in Electric Vehicles. 6. Security Challenges and Solutions for Protecting IoT Networks in Electric 7. Vehicles. 8. Data Analysis from IoT Devices for Improving Electric Vehicle Design. 9. Benefits and Challenges of Implementing Autonomous Driving in Electric Vehicles through IoT. 10. Role of 5G Networks in Supporting IoT Applications in Electric Vehicles. 11. Monitoring Environmental Impact of Electric Vehicles using IoT. 12. Integration of Smart Cities and Electric Vehicles through IoT. 13. IoT Technologies for Optimizing Logistics and Fleet Management in Electric Vehicles. 14. Managing Energy Consumption in Electric Vehicles through IoT Sensors. 15. Economic Aspects and Business Models related to IoT Solutions		

	in the Electric Vehicle Industry. 16. Future Trends: Advancements in IoT Technologies and their Impact on the Electric Vehicle Industry.
Learning outcomes:	– Understanding the principles of the electric vehicle industry and the key challenges in it. – Identifying different IoT technologies and understanding the role in electric vehicles. – Gaining knowledge about sensor technologies for monitoring the performance of electric vehicles through IoT technologies. – Acquiring knowledge of the analysis of data obtained from sensors for diagnosing defects and optimizing the performance of electric vehicles. – Gaining knowledge on how to connect electric vehicles to smart charging infrastructure using IoT solutions. – Gain knowledge of the principles of battery management and use IoT data to optimize battery life. – Acquiring knowledge of analyzing data from IoT devices to improve the design and performance of electric vehicles. – Gaining knowledge on integrating practical solutions for the application of IoT solutions in real-life situations of electric vehicles. – Gaining knowledge about future trends in the development of IoT technologies and their impact on the electric vehicle industry.
Sustainable Development Goal (SDG):	SDG7 – Ensure access to affordable, reliable, sustainable, and modern energy for all SDG 9 – Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation SDG11 – Make cities and human settlements inclusive, safe, resilient and sustainable SDG13 – Take urgent action to combat climate change and its impacts
Teaching methods:	Lectures accompanied by multimedia presentations Auditory exercises with analysis of specific practical examples
Assessment methods with grading structure:	Assessment of creativity in classes and exercises with the preparation of independent papers, evaluation of the partial test during the class as well as the evaluation of the final exam. The criterion for monitoring the work and evaluation of the student during the course is as follows: – Seminar 15 points (%), passed if won over 50%. – I Partial exam/test/knowledge test/35 points (%), is passed if more than 50% is scored. – Final exam (II Partial) 50 points (%), passed if won over 50%. – Final exam (Integral) 85 points (%), passed if won over 50%. The total number of points (%) that a student can achieve during the course is a maximum of 50 points (%), which together with the Final (II partial) makes 100 points (%). For students who have not passed the I Partial Exam, the Final Exam (Integral) is organized from the entire material covered during classes and exercises, and is evaluated with 85 points (%), which with the seminar paper/practical work makes 100 points (%). The final success of the student after all the foreseen forms of examination is evaluated and evaluated by the grading system as follows: a) 10 (A) - exceptional success without errors or with minor errors, carries 95-100 points; b) 9 (B) - above average, with some error, carries 85-94 points; c) 8 (C) - average, with noticeable errors, carries

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<tr><td></td><td>75-84 points; d) 7 (D) - generally good, but with more significant drawbacks, carries 65-74 points; e) 6 (E) - meets the minimum requirements, carries 55-64 points; f) 5 (F, FX) - does not meet the minimum requirements, less than 55 points.
The total evaluation of all student obligations during the semester, i.e. the grade on the exam, is based on the total number of points (%) that the student has acquired by fulfilling the pre-exam obligations and passing the partial and final exam, according to the quality of the acquired knowledge and skills, and contains a maximum of 100 points, and is determined according to the following scale:

<table>
<tr><td>The Student's Responsibilities</td><td>Score (%)</td></tr>
<tr><td>Attendance at lectures and exercises
(attendance at all forms of teaching is mandatory at least 80% and this is a condition for the certification/signature of regular attendance)</td><td>0 points</td></tr>
<tr><td>Seminar</td><td>15 points (%)</td></tr>
<tr><td>I Partial Exam / Test / Knowledge Assessment /</td><td>35 points (%)</td></tr>
<tr><td>Final exam (II partial)</td><td>50 points (%)</td></tr>
<tr><td>Final exam (Integral)</td><td>85 points (%)</td></tr>
</table>
</td></tr>
<tr><td>Literature:</td><td>Mandatory:
1. Hui-Huang Hsu, Chuan-Yu Chang "Big Data Analytics for Sensor-Network Collected Intelligence" -, ScienceDirect, 2017
2. David Hanes, Gonzalo Salgueiro, Patrick Grossetete "IoT Fundamentals: Networking Technologies, Protocols, and Use Cases for the Internet of Things“, 2017</td></tr>
</table>

Course code: **13-14-15-12TRTES020203**	**Course title:** **MANAGEMENT OF DANGEROUS GOODS TRANSPORT**		
Level: II	**Year: II**	**Semester: III**	**Number of ECTS credits: 6**
Status: Elective course		**Total number of contact hours: 90** Optional breakdown of hours by type: Lectures 45 Tutorials 30 Laboratory tutorials 15	
Course participants:	**Academic staff and associates selected in the field to which the course belongs/course**		
Prerequisite for enrollment:	None		
Course goal (goals):	This course provides an in-depth understanding of the regulations, guidelines, and best practices for the safe transportation of dangerous goods. Students will learn about the classification, packaging, labeling, documentation, and emergency response procedures associated with transporting hazardous materials.		
Topics covered (Units of study): *(if necessary, the weekly implementation plan is established taking into account the specificities of*	1. Introduction to TDG Management. 2. Overview of international and national regulations. 3. Legal responsibilities of shippers, carriers, and consignees. 4. Consignor and consignee responsibilities. 5. Hazard Classification and Identification. 6. Packaging, Storage and Marking. 7. Shipping documents: shipping orders, bills of lading, TDG		

organizational units)	declarations, reporting. 8. Handling and Loading: safe handling practices for dangerous goods. 9. Compatibility of different dangerous goods. 10. Loading and securing hazardous materials for transport sea, air and land transport. 11. Dangerous goods vehicles monitoring, Emergency Response and Incident Management. 12. Procedures for responding to spills, leaks, and accidents. 13. Environmental and Safety Considerations. 14. Risk assessment, controlling the risks and risk management strategies. 15. Sustainability and best practices in TDG management.
Learning outcomes:	– Explain the key regulations and legal requirements governing the transportation of dangerous goods. – Classify dangerous goods according to their hazard characteristics. – Select appropriate packaging materials and methods for various types of dangerous goods. – Apply proper labeling, marking, and placarding techniques for hazardous materials. – Understand the documentation and record-keeping obligations in TDG transportation. – Application of route planning tools and risk assessment tools. – Develop and implement emergency response plans for incidents involving dangerous goods. – Evaluate the environmental and safety implications of transporting hazardous materials.
Sustainable Development Goal (SDG):	SDG3 – Ensure healthy lives and promote well-being for all at all ages SDG 9 – Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation SDG11 – Make cities and human settlements inclusive, safe, resilient and sustainable SDG13 – Take urgent action to combat climate change and its impacts
Teaching methods:	Teaching methods: – Lectures: Traditional lectures and use multimedia presentations, real-world case studies, and interactive discussions to engage students; – Group Discussions: Facilitate group discussions on specific topics or case studies related to TDG management. Encourage students to share their insights, ask questions, and debate different approaches to handling dangerous goods; – Case Studies: Present real-life case studies of incidents involving the transportation of dangerous goods. Analyze what went wrong, identify regulatory violations, and discuss how better management practices could have prevented the incidents; – Guest Speakers and Webinars: Invite industry experts, regulatory officials, or professionals from transportation companies to speak about their experiences and challenges in TDG management. This provides students with practical insights and networking opportunities. Arrange online webinars with experts in TDG management from different parts of the world. This exposes students to global perspectives and practices;

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– Field Trips: Arrange visits to warehouses, distribution centers, or transportation companies involved in handling dangerous goods. This offers students a chance to observe real-world practices and regulations in actio.
Assessment Methods:
– Quizzes and tests
– Practical exercises on packaging, labeling, and documentation
– Group projects on developing emergency response plans
– Final examination covering all course topics
</td></tr>
<tr><td>Assessment methods with grading structure:</td><td>
<table>
<tr><td colspan="4">Knowledge assessment (maximum number of points: 100)</td></tr>
<tr><td>Pre-examination obligations</td><td>Points</td><td>Final test</td><td>Points</td></tr>
<tr><td>Activity during the lecture</td><td>-</td><td>Written exam</td><td>50</td></tr>
<tr><td>Practical classes</td><td>-</td><td>Oral examination</td><td>-</td></tr>
<tr><td>Colloquiums</td><td>30</td><td></td><td></td></tr>
<tr><td>Seminar paper</td><td>20</td><td></td><td></td></tr>
<tr><td>In total</td><td></td><td>Total</td><td>100</td></tr>
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</td></tr>
<tr><td>Literature:</td><td>

Relevant online resources and guidelines from transportation regulatory authorities
IATA Dangerous Goods Regulations
IMDG Code (International Maritime Dangerous Goods Code)
Bukljaš S., Bukljaš Z.: „Zaštita u prometu“, Fakultet prometnih znanosti, Zagreb, 2015.
Cassini, P., Hall, R. and Pons, P.: „Transport of Dangerous Goods through Road Tunnels“, Quantitative Risk Assessment Model (Version 3.60), Reference Manual. OECD/PIARC/EU (CDROM), February 2003.
Council Directive 96/82/EC of 9 December 1996 on the control of major-accident hazards involving dangerous substances, Official Journal L 010, P. 0013 – 0033, 14 January 1997.
D. Knežević: „Intervencije u nesrećama pri prijevozu opasnih tvari“, Hrvatska vatrogasna zajednica, Zagreb, 2014.
Directive 2004/54/EC of the European Parliament and of the Council of 29 April 2004 on minimum safety requirements for tunnels in the Trans-European Road Network, Official Journal of the European Union L 167 of 30 April 2004.
Directive 2008/68/EC of the European Parliament and of the Council of 24 September 2008 on the inland transport of dangerous goods (Text with EEA relevance), 2008
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Andrea M., Péter P.: „Management of risks associated with dangerous goods transportation-review, 2019.
Lindov, O.: „Sigurnost cestovnog saobraćaja“, Fakultet za saobraćaj i komunikacije, Univerzitet u Sarajevu, 2008.
Lindov, O., Kiso, F., Kosovac, A., Čolaković, A., Memić, B., Hasković, A., Begović, M., Omerhodžić, A., & Berković, M.: „Inovativne tehnologije u sigurnosti saobraćaja i transporta“, (p. 467). Fakultet za saobraćaj i komunikacije Univerziteta u Sarajevu, 2022.
Priručnik za prijevoznike i vozače vozila za prijevoz opasnih

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	materija, IPI-Institut za privredni ižinjering, Zenica, 2009. 15. Risk Management Framework (https://transport.ec.europa.eu/transport-themes/transport-dangerous-goods/risk-management-framework_en) 16. Sporazum o prevozu opasnih materija u cestovnom saobraćaju (ADR)