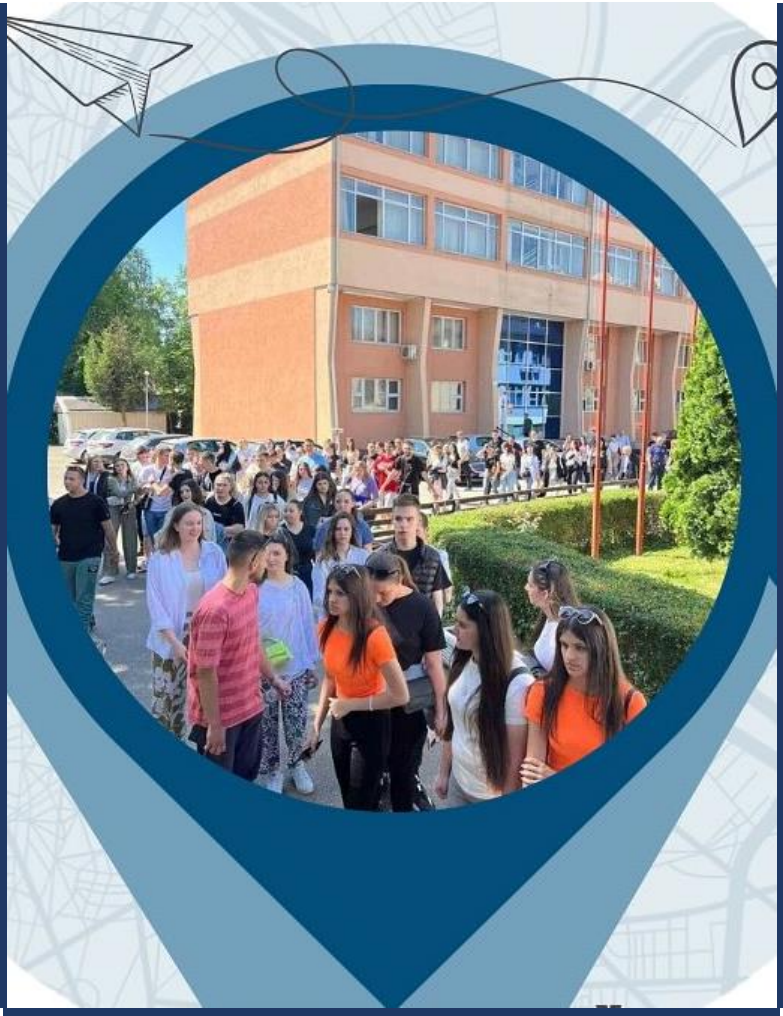

UNIVERSITY OF EAST SARAJEVO
FACULTY OF TRANSPORT AND TRAFFIC ENGINEERING
DOBOJ

Courses in English for ERASMUS+ exchange students

2024/2025

PIC CODE – 995607904

OID - E10186879

ERASMUS+ contact

Associate professor Željko Stević, PhD,

vice-dean for science, research and entrepreneurship

https://sf.ues.rs.ba/eng/

I CYCLE

I CYCLE					
WINTER SEMESTER					
Code	**Course title**	**Study programme**	**ECTS**	**Department**	**Language**
SAF11SZ07202245,0320	Operations Research	TTE	5	RTL	English
SAF11SL07107565,0320	Warehouse Systems	TTE	6	RTL	English

I CYCLE					
SUMMER SEMESTER					
Code	**Course title**	**Study programme**	**ECTS**	**Department**	**Language**
SAF11SL07107976,0320	Special Areas of Logistics	TTE	5	RTL	English
SAF11SL07108076,0320	Industrial Logistics	TTE	6	RTL	English

II CYCLE – Master's degree

II CYCLE – Master's degree					
WINTER SEMESTER					
Code	**Course title**	**Study programme**	**ECTS**	**Department**	**Language**
SAF12SD03218316,0320	Traffic networks	TTE	6	RTT	English
SAF12SD03218416,0320	Deterministic Models of Operational Research	TTE	6	RTT	English
SAF12SD03218516,0320	Telematic Systems in Road Traffic	TTE	6	RTT	English
SAF12SD03218816,0311	Terminals and Parking	TTE	6	RTT	English
SAF12SŽ03119516,0320	High-Speed Train Systems	TTE	6	RTL	English
SAF12SŽ03219616,0311	Selected Chapters from the Technology for the Exploitation of Railway Traffic	TTE	6	RTL	English
SAF12SŽ03219716,0311	Work Theory of Railway Network Operator and Towing Organization	TTE	6	RTL	English
SAF12SŽ03219816,0311	Planning and Design of Railway Lines	TTE	6	RTL	English
SAF12SŽ03219916,0311	Selected Chapters from the Transport of Passengers by Rail	TTE	6	RTL	English
SAF12SŽ03220116,0311	Selected Chapters from the Transport of Goods by Rail	TTE	6	RTL	English
SAF12SL03120616,0311	Planning and Design of Logistics Centres	TTE	6	RTL	English
SAF12SL03220716,0320	Operational Planning of Transhipment Processes	TTE	6	RTL	English
SAF12SL03220816,0320	Logistics System Performance Modelling	TTE	6	RTL	English
SAF12SL03221016,0311	Logistics of Hazardous Materials	TTE	6	RTL	English
SAF12SL03221116,0311	Supply Chain Modelling and Management	TTE	6	RTL	English
SAF12SL03221216,0311	Quality Management Methods in Logistics	TTE	6	RTL	English
SAF12SD03118116,0311 SAF12SL03118116,0311 SAF12SŽ03118116,0311 SAF12ST03118116,0311 SAF12SI03118116,0311 SAF12SM03118116,0311	Models, Simulations and Animations in Traffic	TTE	6	ICST RTL RTT MVOMDV	English
SAF12ST03121916,0311 SAF12SI03121916,0311	Telematics Systems	TTE	6	ICST	English
SAF12ST03222016,0311	Electronic Systems	TTE	6	ICST	English
SAF12ST03222116,0311	Project Management in Postal Traffic	TTE	6	ICST	English
SAF12ST03210516,0311	Multimedia Communications	TTE	6	ICST	English
SAF12ST03222216,0311	Communication Systems in Postal Traffic	TTE	6	ICST	English
SAF12SI03209316,0311	Design and Application of Digital Systems	TTE	6	ICST	English
SAF12SI03224616,0311	Design of Computer Networks	TTE	6	ICST	English
SAF12SI03224716,0311	Design and Application of Information Systems	TTE	6	ICST	English
SAF12SI03224816,0311	Design of Microprocessor Systems	TTE	6	ICST	English
SAF12SI03222016,0311	Electronic Systems in Traffic	TTE	6	ICST	English

II CYCLE					
SUMMER SEMESTER					
Code	**Course title**	**Study programme**	**ECTS**	**Department**	**Language**
SAF12SD03218926,0320	Traffic Forecasts	TTE	6	RTT	English
SAF12SD03219026,0320	Traffic Regulation and Management	TTE	6	RTT	English
SAF12SD03219126,0320	Traffic Design – Engineering of Street Systems	TTE	6	RTT	English
SAF12SŽ03220426,0311	Risk Analysis	TTE	6	RTL	English
SAF12SŽ03220526,0311	Modelling in Railway Transport	TTE	6	RTL	English
SAF12SL03221426,0320	Special Areas of City Logistics	TTE	6	RTL	English
SAF12SL03221526,0320	Goods Terminals	TTE	6	RTL	English
SAF12SL03221626,0320	Intermodal Transport Technologies	TTE	6	RTL	English
SAF12SL03221726,0320	Logistics Organization Design	TTE	6	RTL	English
SAF12SL03221826,0320	Warehouse Systems Management	TTE	6	RTL	English
SAF12ST03222326,0311	Selected Chapters in the Field of Telecommunications	TTE	6	ICST	English
SAF12ST03222526,0311 SAF12SI03222526,0311	Application of Renewable Energy Sources in Transport	TTE	6	ICST	English
SAF12SI03210326,0311	Network Management and Services	TTE	6	ICST	English
SAF12SI03223826,0311	Application of GIS	TTE	6	ICST	English
SAF12SI03224926,0311	Wireless Sensor Networks	TTE	6	ICST	English
SAF12SI03225026,0311	Parallel Computing Systems	TTE	6	ICST	English
SAF12SM03226426,0320	Unconventional Vehicle Drives	TTE	6	MVOMDV	English

TTE - Transport and Traffic Engineering

Departments:

RTT - Department of Road Transport and Traffic

RTL – Department of Railway Traffic and Logistics

ICST - Department of Information and Communication Systems in Traffic

MVOMDV - Department of Motor Vehicles, Operation, Maintenance and Diagnostics of Vehicles

WINTER SEMESTER – I CYCLE

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering ***Study programme: Transport*** ***Profile: Logistics*** I cycle / IV year of study	

Course title	**SPECIAL AREAS OF LOGISTICS**
Department	Department for Transport Engineering – Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF11SL07107976,0320	mandatory	VII	6.00

Professor/s	PhD Željko STEVIĆ
Associates/s	PhD Željko STEVIĆ

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
3	2	0	3*15*1,4=63	2*15*1,4=42	0*15*1,4=0	1,4

Total teacher workload (hours, per semester) 3*15 + 2*15 + 0*15 = 75 h	Total student workload (hours, per semester) 3*15*1,4+ 2*15*1,4+ 0*15*1,4 = 105 h
Total workload: W+T=U_{opt}= 75 + 105 = 180 hours per semester	

Course aims and learning outcomes	1. to recognize and defines the role and place of scientific disciplines of logistics in the economic system; 2. to creates solutions for different logistics requirements in logistics areas; 3. to apply certain optimization methods in basic logistic subsystems; 4. to select and improve performance in certain busyness systems.
Prerequisites	None
Teaching methods	Lectures, theoretical exercises, consultations
Course content	1. Historical development of logistics 2. Scientific disciplines used in logistics 3. Division and content of logistics in the areas in which it is used 4. Securing transport and traffic 5. Strategy for the development of logistics and intermodal transport 6. Logistics Strategies and Logistics Providers 7. Logistics partnership 8. Midterm test 9. Logistics controlling, logistics technologies 10. Education in logistics 11. Procurement Logistics 12. Suppliers selection 13. Basics of planning in logistics 14. Physical distribution structure, warehouse replenishment, transport planning 15. End-of -.term test

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Alihodžić A., Stević Ž.	Special areas of logistics, University of East Sarajevo, Faculty of Transport and Traffic Engineering	2014	

Additional readings

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Stević Ž., Alihodžić A., S. Knežević, Ž. Stjepanović	Management of medical logistics - the situation in Bosnia and Herzegovina, International May Conference on Strategic Management – IMKSM	2016	154-162
Stević Ž., M. Vasiljević, S. Sremac	Fuzzy AHP and ARAS model for decision making in logistics, 6th International Conference "Economics and Management-Based on New Technologies" EMoNT- Vrnjačka Banja, Serbia	2016	34-43
Stević Ž., Alihodžić A., S. Knežević, Ž. Stjepanović	Management of medical logistics - the situation in Bosnia and Herzegovina, International May Conference on Strategic Management – IMKSM	2016	154-162

Obligations, evaluation criteria	**Assessment methods**	**Points**	**Percentage**
	Preexamination obligations		
	attendance - lectures	5	5%
	attendance - exercises	5	5%
	Seminar paper	10	10%
	Tests	2x25	50%
	Final examination		
	written examination (2 tests)	50	50%
	oral examination	30	30%
	Total	100	100%

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2022/05/Engleski-NPP-I-ciklus-2021.pdf
Applicable from	16/6/2021 - 175 Session of the Council, Faculty of Transport and Traffic Engineering Doboj

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering ***Study programme: Traffic*** ***Profile: Logistics*** I cycle / IV year of study	

Course title	**INDUSTRIAL LOGISTICS**
Department	Department for Transport Engineering – Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF11SL07108076,0320	mandatory	VII	6.00

Professor/s	PhD Željko STEVIĆ
Associates/s	Eldina HUSKANOVIĆ, MSc

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
3	2	-	3*15*1,4=63	2*15*1,4=42	0*15*1,4=0	1,4

Total teacher workload (hours, per semester) 3*15 + 2*15 + 0*15 = 75 h	Total student workload (hours, per semester) 3*15*1,4+ 2*15*1,4+ 0*15*1,4 = 105 h

Total workload: $W+T=U_{opt}$= 75 + 105 = 180 hours per semester

Course aims and learning outcomes	1. planning and organizing manufacturing organizations, 2. basics of industrial systems and industrial logistics, 3. motivation, communication and team work.
Prerequisites	None
Teaching methods	Lectures, theoretical exercises, consultations
Course content	1. Characteristics of manufacturing plans and programs 2. Technologies of basic manufacturing 3. Logistic systems in manufacturing business systems 4. Securing materials 5. Models for optimizing the orders of materials 6. Interoperable transport 7. **Midterm test** 8. Distribution of raw materials and material flow 9. Management forms of realization of industrial transport process 10. Selection methods of technological solutions within industrial transport 11. Transport means in an industrial logistic system 12. Information systems in a logistic chain activity 13. Logistic support for flexible manufacturing 14. Logistic activities in mass services **15. End-of-term test**

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Tihomir Pantelić	Industrijska logistika	2006	1-213

Additional readings

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Tihomir Pantelić	Zbirka riješenih zadataka sa izvodima iz teorije	2006	1-174

Obligations, evaluation criteria	**Assessment methods**	**Points**	**Percentage**
	Preexamination obligations		
	attendance - lectures/exercises	10	10%
	Seminar paper	20	20%
	Midterm test	10	10%
	End-of-term test	10	10%
	Final exam		
	final exam (oral / written)	50	50%
	Total	100	100%

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2022/05/Engleski-NPP-I-ciklus-2021.pdf
Applicable from	16/6/2021 - 175 Session of the Council, Faculty of Transport and Traffic engineering Doboj

SUMMER SEMESTER – I CYCLE

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering ***Study programme: Traffic*** ***Profile: Common course*** I cycle | II year of study	

Course title	**Operations Research**
Department	Department for Transport Engineering - Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF11SZ07202245,0320	elective	IV	5,00

Professor/s	PhD Željko STEVIĆ; PhD Siniša BOŽIČKOVIĆ
Associate/s	

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
3	2	0	3*15*1,4	2*15*1,4	0*15*1,4	1,4

Total teacher workload (hours, per semester) 3*15 + 2*15 + 0*15 = 75 hours	Total student workload (hours, per semester) 3*15*1,4 + 2*15*1,4 + 0*15*1,4 = 105 hours

Total workload: W+T=U_{opt}= 75 + 105 = 180 hours per semester

Course aims and learning outcomes	Students should be able to: 1. Optimize engineering problems using linear and integer programming 2. Solve transportation problems 3. Solve location problems 4. Understand the network planning technique 5. Understand the queueing theory and its application in transportation engineering 6. Calculate the parameters of appropriate queuing system models 7. Apply basic models to real problems
Prerequisites	None
Teaching methods	Lectures, theoretical exercises, debates, seminars
Course content	1. Linear programming 2. Duality problem 3. Integer Linear Programming 4. Transportation problem 5. Location optimization problems 6. Network planning technique (CPM, PERT, PERT/COST methods) 7. I partial examination and test 8. Game theory 9. Matrix games (graphical and analytical method, linear programming in game theory) 10. Queueing theory and its application in transportation engineering 11. Queuing systems without waiting lines 12. Queuing systems with waiting lines 13. Simulation (Monte Carlo method) 14. Appropriate software application 15. II partial examination and test

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
M. Čupić, M. Suknović, G. Radojević, V. Jovanović	Special chapters in decision theory: quantitative analysis, Faculty of Technical Sciences, Novi Sad	2004	1-370

Additional readings

Author/s	**Name of publication, editor**	**Year**	**Pages (from-to)**
D. Teodorović	Transportation networks, Faculty of Transport and Traffic Engineering, Belgrade	2007	1-428
R. Božičković, I. Nikolić	Optimization methods in transportation problems, Faculty of Transport and Traffic Engineering, Doboj	2007	1-228
F.S. Hillier, G.J. Lieberman	Introduction to Operations Research, McGraw-Hill Series, Seventh Edition	2001	1-1240
W.L.Winston, M. Venkataramanan	Introduction to Mathematical Programming: Operations Research, Vol. 1, 4th Edition, Thompson Learning	2002	1-1348

	Assessment methods	**Points**	**Percentage**
Evaluation criteria	Preexamination obligations		
	Tests (2)	40	40 %
	Partial examinations (2)	40	40 %
	Final examination		
	Oral examination	20	20 %
	Total	100	100 %

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2022/05/Engleski-NPP-I-ciklus-2021.pdf
Applicable from	16/6/2021 - 175 Session of the Council, Faculty of Transport and Traffic engineering Doboj

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering ***Study programme: Traffic*** ***Profile: Logistics***	
	I cycle | III year of study	

Course title	**WAREHOUSE SYSTEMS**
Department	Department for Transport Engineering – Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF11SL07107565,0320	mandatory	VI	6.00

Professor/s	PhD Željko STEVIĆ
Associates/s	Eldina HUSKANOVIĆ, MSc

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
3	2	0	3*15*1,4=63	2*15*1,4=42	0*15*1,4=0	1,4

Total teacher workload (hours, per semester) 3*15 + 2*15 + 0*15 = 75 h	Total student workload (hours, per semester) 3*15*1,4+ 2*15*1,4+ 0*15*1,4 = 105 h

Total workload: $W+T=U_{opt}$= 75 + 105 = 120 hours per semester

Course aims and learning outcomes	1. to determine: the place, role and function of the warehouse in the logistics system; 2. to recognize the importance of the location of the warehouse; 3. to recognize different types of inventory and apply models for their optimization; 4. to recognize the basic characteristics and legality related to processes that are being implemented in warehouses.
Prerequisites	Intermodal transport
Teaching methods	lectures, auditory exercises, laboratory exercises, consultations
Course content	1. The place and role of the warehouse in characteristic logistics processes 2. Warehouse systems 3. Identification and analysis of the basic subsystems of the warehouse and processes in them 4. Analysis of warehouse systems performance 5. Inventories 6. warehouse of piece load 7. Midterm test 8. Warehouse of scattered load 9. Warehouse of liquid load 10. Dimensioning the storage system elements 11. Information system in warehouse systems 12. Safety in storage systems 13. Material handling and inventory in production 14. Warehouse location 15. End-of-term test

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Ilija Ćosić, Željko Stević	Skladišni sistemi, skripta Saobraćajni fakultet Doboj	2016	

Additional readings

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Ranko Božičković i dr.	*Integration of Simulation and Lean Tools in Effective Production Systems – Case Study, Strojniški vestnik-Journal of Mechanical Engineering 58.11*	2012	642-652
Ranko Božičković	*Mathematical model formulation in optimal program planning of individual and lean production, 11th International Research/Expert Conference "Trends in the Development of machinery and Associated technology" TMT 2007, Hammamet, Tunisia,*	2007	423-426
Ž. Stević	*Izbor i merenje ključnih indikatora performansi u skladišnom sistemu" XIX Internacionalni naučni skup SM 2015 Strategijski menadžment i sistemi podrške odlučivanju u strategijskom menadžmentu, Subotica-Palić*	2015	931-938

Obligations, evaluation criteria	**Assessment methods**	**Points**	**Percentage**
	Preexamination obligations		
	attendance - lectures	5	5%
	attendance - exercises	5	5%
	Midterm and End-of-term test	2x30	60%
	Final examination		
	written examination (2 tests)	60	60%
	oral examination	30	30%
	Total	100	100%

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2022/05/Engleski-NPP-I-ciklus-2021.pdf
Applicable from	16/6/2021 - 175 Session of the Council, Faculty of Transport and Traffic engineering Doboj

WINTER SEMESTER – II CYCLE

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering ***Study programme: Traffic*** ***Profile: Road Transport and Traffic*** II cycle | I year of study	

Course title	**TRAFFIC NETWORKS**
Department	Department of Road Transport and Traffic - Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SD03218316,0320	elective	I	6

Professor/s	PhD Marko M. Subotić
Associate/s	PhD Dunja Radović Stojčić

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
3	2	0	3*15*1,4=63	2*15*1,4=42	0*15*1,4=0	1,4

Total teacher workload (hours, per semester) 3*15 + 2*15 + 0*15 = 75	Total student workload (hours, per semester) 3*15*1,4 + 2*15*1,4 + 0*15*1,4 =105

Total workload: $W+T=U_{opt}$= 75+105= 180 hours per semester

Course aims and learning outcomes	1. knowledge of terms and definitions of traffic networks 2. acquiring knowledge for analysis, optimization, simulation and evaluation of traffic networks with the help of intelligent traffic systems 3. students master certain simulations 4. studentsapply the acquired knowledge in practice
Prerequisites	None
Teaching methods	Lectures, exercises, simulations
Course content	1. Traffic networks, definitions, types, development 2. Travel time models in the city network 3. Travel time research 4. Base matrices IC-based on traffic counting, entropic models, IC matrices derived from transport models 5. M I and II principles of Wordrop (Wordrop traffic distribution departments) 6. Balance models 7. Flow distribution in complex traffic management systems with and without ISS support 8. The first and second paradox in the distribution of traffic flows 9. Debate - Traffic networks, types, regulations 10. Tasks -Expected effects, models of traffic distribution on the network 11. Debate - Wordrop's principles 12. Tasks - traffic distribution 13. Tasks - determining IC matrices based on traffic counting 14. Debate-First and second paradox, investments, valuation 15. Using different distribution models determine the effects of the traffic management system

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Вукановић С.:	Саобраћајне мреже I, Саобраћајни факултет	2000.	-

Additional readings

Author/s	**Name of publication, editor**	**Year**	**Pages (from-to)**
	Traffic Eng. Handbook Prentice Hall	1990	-

Evaluation criteria	**Assessment methods**	**Points**	**Percentage**
	Pre-examination obligations		
	attendance	5	5 %
	activity during classes	5	5 %
	Semestral paper	20	20 %
	Midterm Test	20	20 %
	End of the Term test	20	20 %
	The final exam		
	Final exam (oral)	30	30 %
	TOTAL	100	100 %

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
Applicable from	19.10.2023 - 213th session of the Academic Council, Faculty of Transport and Traffic Engineering in Doboj

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering ***Study programme: Traffic*** ***Profile: Road Transport and Traffic*** II cycle | I year of study	

Course title	**DETERMINISTIC MODELS OF OPERATIONAL RESEARCH**
Department	Department of Road Transport and Traffic- Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SD03218416,0320	elective	I	6,0

Professor/s	PhD Željko Stević
Associate/s	PhD Željko Stević

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
3	2	0	3*15*1,4=63	2*15*1,4=42	0*15*1,4=0	1,4

Total teacher workload (hours, per semester) 3*15 + 2*15 + 0*15 = 75	Total student workload (hours, per semester) 3*15*1,4 + 2*15*1,4 + 0*15*1,4 =105

Total workload: $W+T=U_{opt}$= 75+105= 180 hours per semester

Course aims and learning outcomes	1. selection of type of mathematical model for given optimization tasks 2. solving complex tasks by performing optimization using linear and integer programming 3. performing sensitivity analysis to changes in input parameters 4. observing the advantages and disadvantages of deterministic models of OR 5. monitoring the performance of traffic systems
Prerequisites	None
Teaching methods	lectures, auditory exercises, laboratory exercises, consultations
Course content	1. Modeling of practical tasks with models of linear and integer programming 2. Sensitivity analysis 3. Application of appropriate softwares 4. Duality 5. Economic interpretation of dual variables 6. Case studies 7. Midterm test 8. Scheduling of workers and resources 9. Multi-stage transport tasks 10. Dynamic models 11. Nonlinear programming 12. Optimization of functions of one and more variables without and with constraints 13. Applications in traffic and transport 14. Simulation, application of appropriate software 15. End-of-term test

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
F.S. Hillier, G.J. Lieberman	Introduction to Operations Research, McGraw-Hill Series, Seventh Edition	2001.	1-1240
W.L. Winston, M. Venkataramanan	Introduction to Mathematical Programming: Operations Research, Vol. 1, 4th Edition, Thompson Learning	2002.	1-1348

Evaluation criteria	**Assessment methods**	**Points**	**Percentage**
	Pre-examination obligations		
	Seminar paper	20	20
	Tests (2)	40	40
	Final examination		
	Final exam	40	40
	TOTAL	100	100

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
Applicable from	19.10.202 . - 213th session of the Academic Council, Faculty of Transport and Traffic Engineering Doboj

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering ***Study programme: Traffic*** ***Profile: Road Transport and Traffic*** II cycle | I year of study	

Course title	**TELEMATIC SYSTEMS IN ROAD TRAFFIC**
Department	Department of Road Transport and Traffic - Faculty of Transport and Traffic Engineering

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SD03218516,0320	elective	I	6

Professor/s	PhD Vuk Bogdanović, Full Professor
Associate/s	PhD Vuk Bogdanović, Full Professor

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
3	2	0	3*15*1,4=63	2*15*1,4=42	0*15*1,4=0	1,4

Total teacher workload (hours, per semester) 3*15 + 2*15 + 0*15 = 75	Total student workload (hours, per semester) 3*15*1,4 + 2*15*1,4 + 0*15*1,4 =105

Total workload: $W+T=U_{opt}$= 75+105= 180 hours per semester

Course aims and learning outcomes	1. knowledge of concepts and definitions of intelligent transport systems 2. Introducing students to the performance of intelligent transport systems (its) that are used to support systems for control, management and safe movement of road traffic 3. students master certain current case studies 4. apply the acquired knowledge in practice1.
Prerequisites	None
Teaching methods	Lectures, interactive workshops, case studies, team presentations
Course content	1. Intelligent transport systems – Introduction 2. Basic models and ITS 3. Transport networks and ITS 4. ITS system architecture 5. Possible ITS applications, Taxonomy 6. Traffic management - traffic distribution and application of ITS 7. Systems designed for safe traffic 8. Sensor and ad-hoc networks for traffic monitoring and regulation 9. Traffic management on highways in urban areas 10. Vehicle-vehicle (V2V) and vehicle-infrastructure (V2I) communications 11. Vehicle location and navigation systems 12. Electronic payment systems 13. Application of public broadcasting systems (RDS, DAB) in traffic 14. Use of public fixed and mobile networks in road traffic 15. Consideration of characteristic and current case studies

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
M. A. Chowdhury, A. Sadek:	Fundamentals of Intelligent Transportation Systems Planning, Artech House	2003.	-
R. Bishop:	Intelligent Vehicle Technology and Trends, Artech House	2005.	-
B. McQuin, R. Schuman, K. Chen:	Advanced Traveler Information Systems, Artech House	2002.	-
С. Вукановић:	ИТС у друмском саобраћају-основе, CD	2012.	-

Additional readings

Author/s	**Name of publication, editor**	**Year**	**Pages (from-to)**

Evaluation criteria	**Assessment methods**	**Points**	**Percentage**
	Pre-examination obligations		
	attendance	20	20 %
	activity during classes	20	20 %
	term paper	20	20 %
	Midterm test	10	10 %
	End-of-term test	10	10 %
	The final exam		
	Final exam (oral)	20	20 %
	TOTAL	100	100 %

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
Applicable from	19.10.2023 - 213th session of the Academic Council, Faculty of Transport and Traffic Engineering Doboj

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study programme: Traffic*** ***Profile: Road transport and traffic*** II cycle | I year of study	

Course title	**TERMINALS AND PARKING**
Department	Road Traffic and Transport - Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SD03218816,0311	elective	I	6,00

Professor/s	PhD Bojan Marić, Associate Professor
Associate/s	PhD Dunja Radović Stojčić

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
X	Y	Z	$X*15*S_o$	$Y*15*S_o$	$Z*15*S_o$	

Total teacher workload (hours, per semester) X*15 + Y*15 + Z*15 = W hours	Total student workload (hours, per semester) $X*15*S_o + Y*15*S_o + Z*15*S_o$ = T hours

Total workload: $W+T=U_{opt}$= + = hours per semester

Course aims and learning outcomes	By mastering this course the student will be able to: 1. quantifies the requirements of terminal users by categories, 2. optimizes the conceptual and technological solution of the terminal depending on the technological process that takes place in the terminal, 3. defines the criteria for the selection of the location of the terminal depending on the state of the transport system of the city, 4. quantifies the requirements for parking in a certain zone or city depending on the degree of attractiveness, 5. defines the strategy of parking management in the city, populated area or urban zone.
Prerequisites	Does not have
Teaching methods	Lectures, tutorials, seminar paper, fieldwork, case study
Course content	1. Decomposition of the transport system structure 2. Defining the location and role of the terminal in the transport process 3. Optimization of the structure and capacity of the terminal in accordance with the technological process that takes place in the terminal 4. Logistic approach in terminal design and influence on the rational structure of the transport system 5. Parking management strategy 6. Planning of parking needs in accordance with the degree of attractiveness of the zone 7. Ways to solve parking problems 8. Street parking 9. Off-street parking 10. Parking lot 11. Garage parking 12. Parking garage equipment 13. Logistic approach in terminal design and impact on the rational structure of the transport system 14. Preparation of a case study for terminals 15. Preparation of a case study for parking in a certain zone

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Nada Milosavljevich	Parking, Faculty of Transport and Traffic Engineering, Belgrade	2010.	1-165

Additional readings

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Todd Litman	Parking Management: Strategies, Evaluation and Planning, Victoria Transport Policy Institute	2016.	1-31
Kostic, S., Davidović, B., Papić, Z.	Road traffic terminals, FTN Novi Sad	2013.	1-214
Nada Milosavljevic	Elements for technological design of facilities in road traffic and transport, Faculty of Transport and Traffic Engineering, Belgrade	2003.	1-127

	Assessment methods	**Points**	**Percentage**
Evaluation criteria	Pre-exam obligations		
	attendance - lectures / exercises	10	10%
	positively assessed. paper / project / essay	20	20%
	case study - group work	/	/
	test	70	70%
	laboratory work / lab. exercises	/	/
	practical work	/	/
	Final exam		
	final exam (oral / written)		
	TOTAL	100	100%

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
Applicable from	19.10.2023 - 213th session of the Academic Council, Faculty of Transport and Traffic Engineering Doboj

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj **Study programme: Traffic Profile: Railway traffic**	
	II cycle | I year of study	

Course title	**HIGH-SPEED TRAIN SYSTEMS**
Department	Department for Transport Engineering – Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SŽ03119516,0320	mandatory	I	6.00

Professor/s	PhD Ratko Đuričić, Full Professor
Associate/s	Vladimir Malčić, Senior Assistant

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient So**
L	**TE**	**LE**	**L**	**TE**	**LE**	**So**
3	2	0	3*15*1,4=63	2*15*1,4=42	0*15*1,4=0	1,4

Total teacher workload (hours, per semester) 3*15 + 2*15 + 0*15 = 75 hours	Total student workload (hours, per semester) 3*15*1,4 + 2*15*1,4 + 0*15*1,4 = 105 hours
Total workload: W+T=Uopt = 75 + 105 = 180 hours per semester	

Course aims and learning outcomes	By mastering this course students will be able to: get acquainted with high-speed trains, analyze their technical and aerodynamic characteristics independently work on the construction of high-speed trains, as well as performance calculations, kinematics and dynamics, simulating high-speed train movements as well as self-guiding curtain sets
Prerequisites	None
Teaching methods	Lectures, auditory exercises, consultations.
Course content	Basic requirements and basic performance of high-speed train sets and track design Technical and aerodynamic characteristics of diesel-engine sets of high-speed trains, electro-motor sets and sets with self-loading box Basic characteristics of magnetically-levitation set Computer systems Signaling systems Telecommunication systems Security systems for the safety of the route Types and characteristics of traction engines Linear engines Numerical analysis and simulation of high speed gear sets Determination and baseline calculation of basic aerodynamic effects during the movement of high- speed trains Calculation of kinematic and dynamic performances Simulation of self-assembly of sets in the curve Dimensioning of stable electric power train units of high-speed trains and traction electric motors Linear engine calculation

Textbook (s)

Author/s	Name of publication, publisher	Year	Pages (from-to)
Rusov S.	High speed trains, authorized CD,Faculty of Transport and Traffic engineering, Belgrade	2008	

	Assessment methods	**Points**	**Percentage**
Evaluation criteria	Pre-exam obligations		
	Attendance - lectures	10	10%
	Positively evaluated seminar paper	20	20%
	Project presentation	20	20%
	Exam/tests	20	20%
	Laboratory work-practice		
	Practical work		
	Final exam		
	wrriten	15	15%
	oral	15	15%
	Total	100	100%

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
Applicable from	19.10.2023 - 213th session of the Academic Council, Faculty of Transport and Traffic Engineering Doboj

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study programme: Traffic*** ***Profile: Railway traffic*** II cycle | I year of study	

Course title	**SELECTED CHAPTERS FROM THE TEHNOLOGY FOR THE EXPLOITATION OF RAILWAY TRAFFIC**
Department	Transport Engineering – Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SZ03219616,0311	elective 1	I	6.00

Professor/s	PhD Branislav Bošković, Full Professor
Associate/s	Vladimir Malčić, Senior Assistant

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient So**
L	**TE**	**LE**	**L**	**TE**	**LE**	**So**
3	1	1	3*15*1,4	1*15*1,4	1*15*1,4	1,4

Total teacher workload (hours, per semester)3*15 + 1*15 + 1*15 = 75 hours	Total student workload (hours, per semester)3*15*1,4 + 1*15*1,4 + 1*15*1,4 = 105 hours
Total workload: W+T=Uopt = 75 + 105 = 180 hours per semester	

Course aims and learning outcomes	Training of students for the application of modern methods and models for determining the permeability and transport capacity of the railways, stations and railway systems in general.
Prerequisites	Attendance, homework, tests, self-study, consultations.
Teaching methods	Teaching takes place in the form of lectures, auditory exercises. Learning, tests, tasks and consultations.
Course content	1. Controlling the flow of wagons on the railway network 2. Planning the development of the capacity of railway stations 3. Planning the development of terminal capacities 4. Planning work technology in railway stations 5. Planning of terminal technology 6. Planning work technology on industrial tracks 7. Modern technologies of organization of rail freight traffic 8. Planning of passengers transport on railway 9. Modern technologies of organization of passenger transport 10. Techno-economic evaluation and evaluation of investment projects on the railway 11. Quality of transport services 12. Optimization of the development of the structure of the freight wagon park of the railway 13. Models of train formation 14. Methods for improving the utilization of freight wagons through demand prediction 15. Railway tariffs

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Čičak M. Vesković S.	Organization of Railway Traffic,Belgrade	2006	
Čičak M. Vesković S.	Organization of Railway Traffic,a collection of solved task, Faculty of Transport and Traffic Engineering, Belgrade	1999	--
Čičak M. Vesković S. Mladenović S.	Models for determining the capacity of the railway, Faculty of Transport and Traffic engineering, Belgrade	2002	--

Evaluation criteria	**Assessment methods**	**Points**	**Percentage**
	Preexamination obligations		
	Attendance - lectures	5	5%
	Seminar paper	25	25%
	Midterm and End-of.term test	2x15	30%
	Final examination		
	Oral examination	40	40%
	Total	100	100%

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
Applicable from	19.10.2023 - 213th session of the Academic Council, Faculty of Transport and Traffic Engineering Doboj

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study programme:*** **Traffic** ***Profile:*** **Railway traffic** II cycle | I year of study	

Course title	**WORK THEORY OF RAILWAY NETWORK OPERATOR AND TOWING ORGANIZATION**
Department	Transport Engineering - Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SŽ03219716,0311	Elective 1	I	6.00

Professor/s	PhD Predrag Jovanović, Associate Professor
Associate/s	PhD Predrag Jovanović, Associate Professor

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**L**
3	1	1	3*15*1,4=63	1*15*1,4=21	1*15*1,4=21	1,4

Total teacher workload (hours, per semester)3*15 + 1*15 + 1*15 = 75 hours	Total student workload (hours, per semester)3*15*1,4 + 1*15*1,4 + 1*15*1,4 = 105 hours

Total workload: $W+T=U_{opt}$ = 75 + 105 = 180 hours per semester

Course aims and learning outcomes	By mastering this course the student will be able / able to: 1. get acquainted with the basics of restructuring and deregulation of the railway system; 2. calculates the turnover of locomotives and calculates the rotation of rolling stock; 3. allocates costs from the spectrum of operators and infrastructure managers; 4. get acquainted with the multi-criteria approach and the calculation of fees for the use of railway infrastructure.
Prerequisites	None
Teaching methods	Lectures, auditory exercises, consultations.
Course content	1. Basic concept, principles and laws in railway traffic. 2. Restructuring and deregulation of the railway system. 3. Principles and concepts of railway traffic organization. 4. Legality and quantitative and qualitative indicators of work and use of freight and passenger cars and locomotive parks. 5. Locomotive trade. Owning a locomotive. Turnus of driving staff. 6. Train costs from the aspect of operators and infrastructure managers. 7. New approaches and techniques in the maintenance of railway vehicles. 8. Impact of train delays and timetable disruptions on the operator and infrastructure manager. 9. Fees as an element of railway market regulation. 10. Harmonization of individual indicators of the railway subsystem. 11. Harmonization of individual railway subsystems 12. Elements for determining fees for access to and use of railway infrastructure. 13. Multi-criteria approach to the choice of methods for determining the amount of compensation. 14. Discussion of the applied methods of calculation of fees in certain countries. 15. Presentation of project work.

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Mandić D.	*Train towing organization, Faculty of Transport andTraffic Engineering, Belgrade*	2002	
Dinić D.	*Vuča Vozova, Zavod za novinsko-izdavačku ipropagandnu delatnost JŽ, Beograd*	1983	
Kovačević P.	*Eksploatacija železnica knjiga I i II, Zavod za NIP delatnost JŽ, Beograd*	1988	

Evaluation criteria	**Assessment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	Attendance - lectures	10	10%
	Positively evaluated seminar paper	20	20%
	Project presentation	20	20%
	Exam/test	20	20%
	Labaratory work-practice		
	Practical work		
	Final exam		
	wrriten	15	15%
	oral	15	15%
	Total	100	100%

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
Applicable from	19.10.2023 - 213th session of the Academic Council, Faculty of Transport and Traffic Engineering Doboj

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study programme:*** **Traffic** ***Profile:*** **Railway traffic** II cycle | I year of study	

Course title	**PLANNING AND DESIGN OF RAILWAY LINES**
Department	Transport Engineering – Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SŽ03219816,0311	Electivel 1	I	6.00

Professor/s	PhD Miloš Ivić, Full Professor
Associate/s	Vladimir Malčić, Senior Assistant

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient So**
L	**TE**	**LE**	**L**	**TE**	**LE**	**So**
3	1	1	3*15*1,4	1*15*1,4	1*15*1,4	1,4

Total teacher workload (hours, per semester)3*15 + 1*15 + 1*15 = 75 hours	Total student workload (hours, per semester)3*15*1,4 + 1*15*1,4 + 1*15*1,4 =105 hours
Total workload: W+T=Uopt = 75 + 105 = 180 hours per semester	

Course aims and learning outcomes	By mastering this course, the student will be able to: 1. participate in the preparation of spatial plans, 2. participate in the preparation of planning and design documents, 3. participate in the evaluation of different railway line alignment s, 4. evaluate the project documentation.
Prerequisites	The conditions for passing the course are: 1. regular attendance (lectures and exercises), 2. completed and defended elaborate, 3. all tests passed,
Teaching methods	Lectures, auditory and computational exercises, consultations
Course content	1. Track constructive elements. 2. Basic characteristics of railway tracks and their constructive elements 3. General settings on the planning and design of railway lines 4. Types and characteristics of spatial plans 5. General principles of design. Conditions for the design of railway lines 6. Horizontal alignment design (**Midterm test**) 7. Vertical alignment design 8. Railway line cross sections - design 9. Final railway line geometry design 10. Bill of Quantities 11. Methodology for railway line design 12. Content and characteristics of project documentation 13. Railway line reconstruction 14. Conditions for designing other rail systems (tram lines, metro lines, high speed rails) 15. Evaluation of railway line alignment s (**End-of-term test**)

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Ivić M.	*Railway tracks,* Faculty of Transport and TrafficEngineering, Belgrade	2005	---
Ivi Popović, Z. ć. M..	*Basics of railway line design*, Faculty of CivilEngineering, Belgrade	2004	---
Ivić M., Kosijer M.	*Railway tracks -workbook* Faculty of Transport andTraffic Engineering, Belgrade	1998	---

Additional readings

Author/s	**Name of publication, editor**	**Year**	**Pages (from-to)**
Ivić M.	*Railway line design*, Lectures in the form of PPpresentations		

Evaluation criteria	**Assessment methods**	**Points**	**Percentage**
	Preexamination obligations		
	The student's activity during lectures	5	5%
	Elaborate	30	30%
	Tests	15	15%
	Colloquiums	30	30%
	Final examination		
	Oral examination	20	20%
	Total	100	100%

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
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	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study programme:*** **Traffic** ***Profile:*** **Railway traffic** II cycle | I year of study	

Course title	**SELECTED CHAPTERS FROM THE TRANSPORT OF PASSENGERS BY RAIL**
Department	Transport Engineering – Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SŽ03219916,0311	elective 2	I	6.00

Professor/s	PhD Ratko Đuričić, Full Professor
Associate/s	Vladimir Malčić, Senior Assistant

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**L**
3	1	1	3*15*1,4=63	1*15*1,4=21	1*15*1,4=21	1,4

Total teacher workload (hours, per semester)3*15 + 1*15 + 1*15 = 75 hours	Total student workload (hours, per semester)3*15*1,4 + 1*15*1,4 + 1*15*1,4 = 105 hours

Total workload: $W+T=U_{opt}$ = 75 + 105 = 180 hours per semester

Course aims and learning outcomes	By mastering this course the student will be able to: 1. to get acquainted with the basic concepts of passenger transport; 2. organizes passenger traffic; 3. make timetables and calculate elements for timetables; 4. calculate the cost of passenger traffic.
Prerequisites	None
Teaching methods	lectures, auditory and laboratory exercises, consultations
Course content	1. Basic concepts of passenger transport. Purpose and categories of travel 2. Factors of choice of mode of transport 3. Basics of passenger transport planning 4. Organization of passenger traffic 5. Use of passenger car park 6. Calculation of the required number of train crew 7. Rail systems for mass passenger transport 8. Passenger station technology 9. Timetables 10. Elements for making timetables 11. Tariff policy. Tariff systems 12. Normative work in passenger traffic 13. Costs of passenger traffic 14. Quality of services in passenger traffic 15. Information system in passenger traffic

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Чичак М., Весковић С.	"Organization of Railway Traffic II", Faculty of Transportand Traffic Engineering, University of Belgrade	2006	
Чичак М., Весковић С.	"Collection of solved tasks", Faculty of Transport and Traffic Engineering, University of Belgrade	2006	

Additional readings

Author/s	**Name of publication, editor**	**Year**	**Pages (from-to)**

Evaluation criteria	**Assessment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	Attendance - lectures	10	10%
	Positively evaluated seminar paper	3x10	30%
	Project presentation	30	30%
	Exam/test		
	Labaratory work-practice		
	Practical work		
	Final exam		
	oral	30	30%
	Total	100	100%

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
Applicable from	19.10.202. - 213th session of the Academic Council, Faculty of Transport and Traffic Engineering Doboj

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study programme:*** **Traffic** ***Profile:*** **Railway traffic** II cycle | I year of study	

Course title	**SELECTED CHAPTERS FROM THE TRANSPORT OF GOODS BY RAIL**
Department	Department for Transport Engineering - Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SŽ03220116,0311	Elective 2	I	6.00

Professor/s	PhD Branislav Bošković, Full Professor
Associate/s	Vladimir Malčić, Senior Assistant

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_0**
L	**TE**	**LE**	**L**	**TE**	**LE**	**L**
3	1	1	3*15*1,4=63	1*15*1,4=21	1*15*1,4=21	1,4

Total teacher workload (hours, per semester)3*15 + 1*15 + 1*15 = 75 hours	Total student workload (hours, per semester)3*15*1,4 + 1*15*1,4 + 1*15*1,4 = 105 hours

Total workload: $W+T=U_{opt}$ = 75 + 105 = 180 hours per semester

Course aims and learning outcomes	By mastering this course students will be able to: 1. get acquainted with the basic concepts of transport of goods; 2. organize the transport of goods; 3. organize the transport of dangerous goods; 4. calculate the costs in the transport of goods as well as to calculate the transport and transport capacities for the transport of goods; 5. participate in the construction of commodity tariffs; 6. apply the acquired knowledge in practice.
Prerequisites	None
Teaching methods	lectures, auditory and calculation exercises, consultations
Course content	1. Basic concepts of transport of goods 2. Organization of transport of goods 3. Planning the volume of transport of goods 4. Train formation 5. Modern concepts in the transport of goods by rail 6. Transport of dangerous goods 7. Intermodal transport in railway transport 8. Transport of special consignments 9. Regulations in the transport of goods by rail 10. Costs in the transport of goods 11. Calculation of traffic and transport capacities for transport of goods 12. Construction of commodity tariffs 13. Infrastructure costs 14. Quality of services in freight transport 15. Information system in the transport of goods

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Čičak M., Vesković S.	"Railway Traffic Organization II", Faculty of Transport and Traffic Engineering, University of Belgrade	2006	

	Assessment methods	**Points**	**Percentage**
Evaluation criteria	Pre-exam obligations		
	Attendance - lectures	10	10%
	Positively evaluated seminar paper	20	20%
	Project presentation		
	Exam/colloquium	30	30%
	Labaratory work-practice		
	Practical work		
	Final exam		
	Final exam(verbally)	40	40%
	In total	100	100%

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
Applicable from	19.10.2023. - 213th session of the Academic Council, Faculty of Transport and Traffic Engineering Doboj

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study programme: Traffic*** ***Profile: Logistics*** II cycle | I year of study	

Course title	**PLANNING AND DESIGN OF LOGISTICS CENTERS**
Department	Department of Transport Engineering - Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SL03120616,0311	mandatory	I	6.00

Professor/s	PhD Marko Vasiljević, Full Professor
Associate/s	PhD Marko Vasiljević, Full Professor

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
3	1	1	3*15*1,4=63	1*15*1,4=21	1*15*1,4=21	1,4

Total teacher workload (hours, per semester)3*15 + 1*15 + 1*15 = 75	Total student workload (hours, per semester)3*15*1,4+ 1*15*1,4+ 1*15*1,4= 105
Total workload: $W+T=U_{opt}$= 75 + 105 = 180 hours per semester	

Course aims and learning outcomes	1. Defines the role and place of different logistics centers; 2. Defines the structure of services and subsystems of the logistics center according to the requirements of goods flows; 3. Defines and correctly structures the criteria for choosing the location of the logistics center; 4. Quantifies the requirements and dimensions of the subsystems of the logistics center.
Prerequisites	None
Teaching methods	lectures, auditory exercises, consultations
Course content	1. 1.Tasks and goals of planning and designing logistics centers, 2. Basic concept of logistics center planning, 3. Design of logistics centers, 4. Macro and micro planning and design of logistics centers, 5. Methodology of designing and planning logistics centers, 6. Macro and micro logistics models of logistics centers, 7. Models of stochastic quantification of logistics centers, 8. Methodology of making the Layout of the logistics center, 9. Economic justification of the construction of the logistics center, 10. Methodology for calculating investments in the construction of a logistics center, 11. Analysis and calculation of costs in the construction of the logistics center, 12. Models and procedure for determining the prices of services in the logistics center, 13. Development of a simulation model of the justification for the construction of a logistics center. 14. Impact of risk on the construction of the logistics center, 15. Model of interactive optimization of logistics chains in order to improve the business of the company

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Slobodan Zečević	Teretni terminali i teretni transportni centri, Saobraćajni fakultet, Beograd	2006	

Additional readings

Author/s	**Name of publication, editor**	**Year**	**Pages (from-to)**
Daganzo C. F.	Logistics Systems Analysis, Springer-Verlag Berlin Heidelberg	2005	

Evaluation criteria	**Assessment methods**	**Points**	**Percentage**
	Preexamination obligations		
	attendance - lectures	5	5%
	attendance - exercise	5	5%
	seminar paper	10	10%
	Tests	2x25	50%
	Final examination		
	oral examionation	30	30%
	Total	100	100%

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
Applicable from	19.10.2023 - 213th session of the Academic Council, Faculty of Transport and Traffic Engineering Doboj

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study programme: Traffic*** ***Profile: Logistics*** II cycle | I year of study	

Course title	**OPERATIONAL PLANNING OF TRANSHIPMENT PROCESSES**
Department	Transport Engineering - Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SL03220716,0320	Elective 1	I	6.00

Professor/s	PhD Ratko Đuričić, Full Professor
Associate/s	Sanja Simić, Senior Assistant

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
3	2	0	3*15*1,4=63	2*15*1,4=42	0*15*1,4=0	1,4

Total teacher workload (hours, per semester)3*15 + 2*15 + 0*15 = 75	Total student workload (hours, per semester)3*15*1,4+ 2*15*1,4+ 0*15*1,4= 105

Total workload: $W+T=U_{opt}$= 75 + 105 = 180 hours per semester

Course aims and learning outcomes	1. knowledge of concepts and definitions of transshipment processes 2. Introducing students to the concepts of operational management of transshipment processes in logistics systems 3. application of optimization methods in the operational management of transhipment processes with the presentation of the effects achieved 4. apply the acquired knowledge in practice
Prerequisites	Transhipment mechanization, Transport logistics
Teaching methods	Classes are conducted in the form of lectures, tutorials, seminar papers (team presentations), case studies and consultations
Course content	1. Tasks and objectives of operational planning of transshipment processes in logistics 2. Operational planning of transshipment processes 3. Possible problems during operational planning of transshipment processes 4. Focusing on potential operational planning issues 5. Operational planning in transhipment processes 6. Basic principles and places of rationalization of transshipment processes 7. Preparation for the colloquium 8. Various variants and methods used in operational planning of transshipment processes 9. Quantitative methods in operational planning of transshipment processes 10. Ways of application of operational planning in means of continuous action 11. Ways of applying operational planning in cyclic transport vehicles 12. Optimization methods applied in operational planning 13. Practical examples and tasks-heuristic approach 14. Practical examples and tasks-metaheuristic approach 15. Preparation for the colloquium

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Vidović M.	Kvantitativna analiza sistema transporta materijala, Saobraćajni fakultet, Beograd	2007	

Additional readings

Author/s	**Name of publication, editor**	**Year**	**Pages (from-to)**
Daganzo C. F.	Logistics Systems Analysis, Springer-Verlag Berlin Heidelberg	2005	

	Assessment methods	**Points**	**Percentage**
Evaluation criteria	Preexamination obligations		
	attendance - lectures/exercise	10	10%
	Project presentation	10	10%
	seminar paper	10	10%
	Midterm test	20	20%
	End-of.term test	20	20%
	Final examination		
	oral examination	30	30%
	Total	100	100%

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
Applicable from	19.10.2023. - 213th session of the Academic Council, Faculty of Transport and Traffic Engineering Doboj

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study program: Traffic*** ***Profile: Logistics*** II cycle | I year of study	

Course title	**LOGISTICS SYSTEM PERFORMACE MODELING**
Department	Transport Engineering - Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SL03220816,0320	Electivel 1	I	6.00

Professor/s	PhD Željko Stević, Associate Professor
Associate/s	PhD Željko Stević, Associate Professor

Weekly hours			**Individual student hours (per semester)**			**Studentworkload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
3	2	0	3*15*1,4=63	2*15*1,4=42	0*15*1,4=0	1,4

Total teacher workload (hours, per semester)3*15 + 2*15 + 0*15 = 75	Total student workload (hours, per semester)3*15*1,4+ 2*15*1,4+ 0*15*1,4= 105
Total workload: W+T=U_{opt}= 75 + 105 = 180 hours per semester	

Course aims and learning outcomes	1. knowledge of concepts and definitions of logistics systems 2. Introducing students to the need to introduce a set of relevant indicators - logistics performance, while respecting the complexity of the processes that implement logistics systems in the business environment 3. tasks of logistics performance, goals, functions and relations between functions in logistics systems 4. apply the acquired knowledge in practice
Prerequisites	None
Teaching methods	Lectures, exercises, video presentations, simulations, presentations
Course content	1. Basic logistics systems and their connection with the conflict of goals in the market 2. The need to introduce a set of relevant indicators - logistics performance in the business environment 3. Problems of applying different approaches and striving for harmonization in this area 4. Associations whose goal is to develop performance models, their improvement 5. Analysis of ten ISPI business performance standards 6. Preparation for the colloquium 7. Measuring and evaluating performance 8. Pointing out the importance of performance analysis from the aspect of user requirements 9. Problems, experiences and recommendations in designing performance measurement systems and models 10. Elaboration of the significance of costs 11. Degree service in performance modeling 12. Flexibility in performance modeling 13. Safety in performance modeling 14. Reliability in performance modeling 15. Preparation for the colloquium

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Radivojevic G., Miljus M.,Vidovic M	Logistics controlling and performance, Faculty of Transport and Traffic Engineering, University of Belgrade	2007	

Additional readings

Author/s	**Name of publication, editor**	**Year**	**Pages (from-to)**
Bromley, P.:	A Measure of Logistics Success, Logistics Quarterly, Vol. 7, No. 3.	2001	-

Evaluation criteria	**Assessment methods**	**Points**	**Percentage**
	Preexamination obligations		
	attendance- lectures/exercise	5	5%
	activity	5	5%
	seminar paper	20	20%
	tests	10	20%
	Midterm test	15	15%
	End-of.term test	15	15%
	Final examination		
	oral examination	30	30%
	Total	100	100%

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
Applicable from	19.10.2023. - 213th session of the Academic Council, Faculty of Transport and Traffic Engineering Doboj

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study programme: Traffic*** ***Profile: Logistics*** II cycle | I year of study	

Course title	**LOGISTICS OF HAZARDOUS MATERIALS**
Department	Transport Engineering - Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SL03221016,0311	Elective 2	I	6.00

Professor/s	PhD Perica Gojković, Full Professor
Associate/s	PhD Perica Gojković, Full Professor

Weekly hours			**Individual student hours (per semester)**			**Studentworkload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
3	1	1	3*15*1,4=63	1*15*1,4=42	1*15*1,4=0	1,4

Total teacher workload (hours, per semester)3*15 + 1*15 +1*15 = 75	Total student workload (hours, per semester)3*15*1,4+ 1*15*1,4+ 1*15*1,4= 105
Total workload: W+T=U_{opt}= 75 + 105 = 180 hours per semester	

Course aims and learning outcomes	1. acquire the concepts of hazardous substances 2. acquaint students with the characteristics of hazardous substances 3. to acquaint students with the directions of action that can affect the increase of safety in the processes of transport, transhipment and storage, as well as the significant impact of this category of goods on the ecosystem as a whole 4. apply the acquired knowledge in practice
Prerequisites	None
Teaching methods	Lectures, exercises
Course content	1. The concept of hazardous substances 2. Relevance and importance of logistics of hazardous materials 3. Classification of hazardous substances and harmonization of regulations 4. Hazardous substances in logistics and transport processes 5. Characteristics of hazardous substances and requirements that work with this type of substance generates: packaging, method of storage, transportation, etc. 6. Defining risks in working with hazardous substances 7. Preventive protection against the adverse effects of hazardous substances 8. Problems of routing and scheduling vehicles in the transport of dangerous 9. Problems of choosing locations for storage of hazardous materials - problem settings 10. Safety procedures and training as a form of preventive action in the event of an adverse event caused by hazardous substances 11. Transport documentation 12. Equipment of vehicles used for transport of dangerous goods 13. Hazard sheets 14. Obligations of participants in the transport of dangerous goods 15. Legal regulations in the transport of dangerous goods

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
UN Orange Book	Recommendations for the Transport of Dangerous Goods, Unated Nations Economic Commission forEurope		
E. Erkut, S.A. Tjandra, V. Verter	Hazardou s Material Transportation, In: C. Bernhart, G.Laporte (Eds.), Handbooks in Operations Research and Management Science, Vol. 14, Transportation,North Holland	2005	

Additional readings

Author/s	**Name of publication, editor**	**Year**	**Pages (from-to)**
	Journal of hazardous materials, Accident Analysis and		
	Prevention, Transportation Science		

Evaluation criteria	**Assessment methods**	**Points**	**Percentage**
	Preexamination obligations		
	attendance - lectures/exercise	5	5%
	activity	5	5%
	seminar paper	25	25%
	Midterm test	20	20%
	End-of.term test	20	20%
	Final examination		
	oral examination	25	25%
	Total	100	100%

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
Applicable from	19.10.2023 - 213th session of the Academic Council, Faculty of Transport and Traffic Engineering Doboj

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study programme: Traffic*** ***Profile: Logistics***	
	II cycle | I year of study	

Course title	**SUPPLY CHAIN MODELING AND MANAGEMENT**
Department	Transport Engineering - Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SL03221116,0311	Elective 2	I	6.00

Professor/s	PhD Snežana Tadić
Associate/s	PhD Snežana Tadić

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
3	1	1	3*15*1,4=63	1*15*1,4=42	1*15*1,4=0	1,4

Total teacher workload (hours, per semester)3*15 + 1*15 +1*15 = 75	Total student workload (hours, per semester)3*15*1,4+ 1*15*1,4+ 1*15*1,4= 105

Total workload: $W+T=U_{opt}$= 75 + 105 = 180 hours per semester

Course aims and learning outcomes	1. define the structure of the process in the flows of materials from the source of raw materials to the final consumer 2. identifiy and quantifies relevant parameters in the analysis and design of supply chains 3. choose the optimal supply chain strategy 4. master supply chain management models
Prerequisites	None
Teaching methods	lectures, tutorials, case studies, debate classes
Course content	1. Defining supply chains 2. Characteristic processes in supply chains 3. Research on the interdependence of resource location, production dynamics, inventory management and transport flows within supply chains 4. Logistics network configuration 5. Identification of relevant factors for the development and implementation of supply chains 6. Characteristic models used in certain supply chain configurations 7. Effects of application of some models on supply chain performance. Colloquium 1 8. Determining the performance of supply chains 9. The importance of proper demand forecasting modeling in supply chains 10. Global supply chains, B2B strategies, the importance of e-commerce and modern information technologies 11. Basic principles of modern supply chain management. Supply chain development planning and strategies. Design of supply chain network 12. Suppliers in supply chain performance and barriers to achieving strategic advantage 13. Supplier and customer relationship management 14. Integration of supply chains. Information technologies and their impact on the coordination of logistics activities within the supply chain 15. Internet business and e-supply chains. Colloquium 2.

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Zecevic, S., Tadic, S.	Upravljanje lancima snabdijevanja, autorizovana skripta	2016	

Additional readings

Author/s	**Name of publication, editor**	**Year**	**Pages (from-to)**
Simchi-Levi, D., Kaminsky, P.,and E. Simchi-Levi:	Designing and Managing the Supply Chain: Concepts, Strategies, and Case Studies, Irwin McGraw Hill,Boston, MA	2000	
Stadler, H., Kilger, C.:	Supply Chain Management and Advanced Planning: Cocepts, Models, Software and Case Studies,Springer-Verlag, Berlin Heidelberg	2002	

Evaluation criteria	**Assessment methods**	**Points**	**Percentage**
	Preexamination obligations		
	attendance - lectures/exercise	5	5%
	activity	5	5%
	seminar paper	30	30%
	Midterm test	20	20%
	End-of.term test	20	20%
	Final examination		
	oral examionation	20	20%
	Total	100	100%

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
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	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study programme: Traffic*** ***Profile: Logistics*** II cycle | I year of study	

Course title	**QUALITY MANAGEMENT METHODS IN LOGISTICS**
Department	Transport Engineering - Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SL03221216,0311	elective 2	I	6.00

Professor/s	PhD Živko Erceg
Associate/s	PhD Živko Erceg

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
3	1	1	3*15*1,4=63	1*15*1,4=42	1*15*1,4=0	1,4

Total teacher workload (hours, per semester)3*15 + 1*15 +1*15 = 75	Total student workload (hours, per semester)3*15*1,4+ 1*15*1,4+ 1*15*1,4= 105

Total workload: W+T=U_{opt}= 75 + 105 = 180 hours per semester

Course aims and learning outcomes	1. knowledge of concepts and definitions of quality 2. Introducing students to the methods, models and methodological procedures of modeling and quality management in logistics 3. to enable students to independently apply existing and develop new models of quality management 4. apply the acquired knowledge in practice
Prerequisites	None
Teaching methods	lectures, tutorials, case studies, debate classes
Course content	1. The concept of quality. Definitions of quality 2. Evolutionary development of quality management system 3. Quality of logistics service, processes and systems 4. Quality functions in logistics, introduction of quality functions in logistics systems 5. Measuring the quality of logistics services, measurement models and methods 6. Measuring customer satisfaction 7. Approach to the introduction of quality management systems. Purpose of quality management system documentation 8. Development of procedures. Building business processes. Flowchart 9. Process management through quality cost management 10. Quality management methods 11. The concept of continuous quality improvement. Quality loop 12. Integrated management systems. Structure. Integration methods 13. Total quality management (TQM) 14. TQM concept and logistics 15. Models of excellence

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Kilibarda M., Zecevic, S.	Upravljanje kvalitetom u logistici, Saobraćajni fakultet, Beograd	2008	
Bobreg M. I dr.	Upravljanje kvalitetom, Mašinski fakultet, Banja Luka	2006	

	Assessment methods	**Points**	**Percentage**
Evaluation criteria	Preexamination obligations		
	attendance - lectures/exercise	10	10%
	seminar paper	20	20%
	Midterm test	10	10%
	End-of.term test	10	10%
	Final examination		
	oral examionation	30	30%
	Total	100	100%

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
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	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study programme: Traffic*** ***Profile: Telecommunications and postal traffic*** II cycle | I year of study	

Course title	**MODELS, SIMULATIONS AND ANIMATIONS IN TRAFFIC**
Department	Department of Transport Engineering - Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SD03118116,0311 ...	mandatory	I	6,00

Professor/s	PhD Mirko Stojčić, Assistant Professor
Associate/s	PhD Mirko Stojčić, Assistant Professor

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
3	1	1	63	21	21	1,4

Total teacher workload (hours, per semester) 3*15 + 1*15 + 1*15 = 75 hours	Total student workload (hours, per semester) 3*15*1,4 + 1*15*1,4 + 1*15*1,4 = 105 hours

Total workload: $W+T=U_{opt}$= 75 + 105 = 180 hours per semester

Course aims and learning outcomes	By mastering the content of this course, the student will be able to: 1. optimize traffic processes 2. model traffic processes 3. simulate traffic processes 4. animate traffic processes
Prerequisites	None
Teaching methods	Lectures, auditory exercises, seminar paper
Course content	1. Modeling. Definition, types of models. Modeling and models 2. Simulation. Computer simulation. Historical overview of simulation development 3. Model classification. Model classification. Formal model specification 4. Estimation of model parameters 5. Validation and verification of the model 6. Probability and statistics in simulation 7. Process simulation 8. Structure of simulation systems 9. Process optimization. Problem formulation. Classification of optimization methods 10. Modular simulation 11. Calculation blocks (modules) 12. Matrix form of technological scheme structure 13. Matrix methods for determining computational cycles 14. Exercises on modern simulation software: SIMUL8, PC CRECH, SIMIO 15. Exercises on modern simulation software: SIMUL8, PC CRECH, SIMIO

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Averill M. Law	Simulation Modeling and Analysis, McGraw-Hill Education	2014.	
Montgomery D.	Design and Analysis of Experiments, John Wiley & Sons	2012.	
Božičković R	Metede optimizacije, Faculty of Transport and Traffic Engineering Doboj	2007.	1-257

Additional readings

Author/s	**Name of publication, editor**	**Year**	**Pages (from-to)**
Čupić M. et al.	Specijalna poglavlja iz teorije odlučivanja, FTN Novi Sad	2009.	1-135

Evaluation criteria	**Assessment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	attendance - lectures / exercises	10	10%
	positively assessed seminar paper / project / essay	10	20%
	case study - group work	10	10%
	test	20	10%
	Final exam		
	Final exam (oral / written)	50	50%
	TOTAL	100	100%

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
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	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study programme: Traffic*** ***Profile: Telecommunications and postal traffic*** II cycle | I year of study	

Course title	**TELEMATICS SYSTEMS**
Department	Information - Communication Systems in Traffic - Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF12ST03121916,0311 SAF12SI03121916,0311	elective	I	6.0

Professor/s	PhD Aleksandar Stjepanović, Associate Professor
Associate/s	PhD Aleksandar Stjepanović, Associate Professor

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient So**
L	**TE**	**LE**	**L**	**TE**	**LE**	**So**
3	1	1	3*15*1.4=63	1*15*1.4=21	1*15*1.4=21	1.4

Total teacher workload (hours, per semester) 3*15 + 1*15 + 1*15 = 75 hours	Total student workload (hours, per semester) 3*15*1.4 + 1*15*1.4 + 1*15*1.4 = 105 hours
Total workload: W+T=Uopt= 75 + 105 = 180 hours per semester	

Course aims and learning outcomes	By mastering the content of this course the student will be able to: 1. Active knowledge of regulations and norms, European regulations related to ITS 2. Proposal of solution of distributed information and communication systems for transport monitoring 3. Research of ITS and interaction with spatial information infrastructure 4. ITS architecture 5. By defining user requirements for the purpose of refixing transport problems
Prerequisites	There is no prior conditionality
Teaching methods	Lectures, auditory exercises, laboratory exercises, consultations
Course content	1. Traffic management. Traffic management strategies 2. Adaptable systems. Network capabilities 3. Basic definitions of ITS. ITS development. 4. European ITS projects, Standards, norms of the directive, legal bases, FRAME project 5. ITS architecture. Theoretical foundations, Possible applications of ITS 6. Traffic management - traffic distribution and application of ITS. 7. Technical preconditions for the application of ITS 8. Detectors and sensors 9. Simulation programs, Evaluation of effects 10. Spatial infrastructure of GIS and ITS. ITS and GPS 11. Variable signaling, standards 12. Traffic management on highways in urban areas 13. Congestion management and application of ITS in congestion management 14. Informing traffic participants, Human factor, QoE, QoS 15. Internet and ITS.

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
A. Stjepanović, M. Kostadinović	Telematski sistemi, University of East Sarajevo	2020	

	Assessment methods	**Points**	**Percentage**
Evaluation criteria	Pre-exam obligations		
	attendance - lectures / exercises	5	5%
	positively graded seminar paper	15	15%
	Midterm test	15	15%
	End-of.term test	15	15%
	laboratory exercises	10	10%
	Final exam		
	oral	40	40%
	IN TOTAL	100	100%

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
Applicable from	19.10.2023. - 213th session of the Academic Council, Faculty of Transport and Traffic Engineering Doboj

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study programme: Traffic*** ***Profile: Telecommunications and postal traffic*** II cycle | I year of study	

Course title	**ELECTRONIC SYSTEMS IN TRAFFIC**
Department	Information and Communication Systems in Traffic, Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF12ST03222016,0311	elective	I	6,0

Professor/s	PhD Miroslav Kostadinović, Associate Professor
Associate/s	PhD Miroslav Kostadinović, Associate Professor

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
X	Y	Z	X*15*S_o	Y*15*S_o	Z*15*S_o	

Total teacher workload (hours, per semester) W = 3*15 + 1*15 + 1*15 = 45 + 15 + 15 = 75 hours	Total student workload (hours, per semester) T=3*15*1,4 + 1*15*1,4 + 1*15*1,4=63 + 21 + 21=105 hours
Total workload: W + T = U_{opt} = 75+ 105 = 180 hours per semester	

Course aims and learning outcomes	The student will acquire: theoretical knowledge of telecommunication systems and networks and their applications in traffic and transport, expertise in public broadcasting systems (RDS, DAB) in traffic from public broadcasting systems (RDS, DAB) in traffic and knowledge in the field of sensor and ad-hoc networks for traffic monitoring and regulation, knowledge of systems and networks intended for modern traffic and transport systems.
Prerequisites	No
Teaching methods	Lectures, auditory exercises, laboratory exercises, consultations
Course content	1 Telecommunication systems and networks and their potential applications in traffic and transport. 2 Application of public broadcasting systems (RDS, DAB) in traffic 3 Public networks for mobile communications 4 Mobile communications for closed user groups 5 Fixed and mobile wireless IP networks 6 Virtual Private Networks 7 Radio over optics (ROF) 8 Sensor and ad-hoc networks for traffic monitoring and regulation 9 Systems designed for safe traffic. 10 Satellite communication systems 11 Vehicle positioning and navigation systems 12 Dedicated radio networks for data transmission (MOBITEX, TETRA, TRAXYS, ARDIS, RICOCHET, ARRAY). 13 Dedicated Short Range Communications in Road Traffic (DSRC) 14 GSM-R - global system of mobile communications for railway applications 15 15 Air transport communications, River information services.

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Ferrari, P., Jakoby, R., Karabey, O. H., Maune, H., & Rehder, G.	Reconfigurable Circuits and Technologies for Smart Millimeter-wave Systems. Cambridge University Press.	2022	
Gumbo, T., Moyo, T., Ndwandwe, B., Risimati, B., & Mbatha, S. G.	Urban Public Transport Systems Innovation in the Fourth Industrial Revolution Era: Global South Perspectives, Reflections and Conjectures. Springer Nature.	2022	
M. A. Chowdhury, A. Sadek,	Fundamentals of Intelligent Transportation Systems Planning, Artech House,	2003	
H. Lehpamer,	RFID Desing Principles, Artech House,	2008	
J. Lavergant, M. Sylvain,	Radio Wave Propagation: Principles and Techniques, Wiley,	2000	

Evaluation criteria	**Assessment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	attendance - lectures / exercises	10	10%
	positively evaluated seminar paper	10	10%
	Midterm test	15	15%
	End-of.term test	15	15%
	laboratory exercises	10	10%
	Final exam		
	Theoretical	40	40%
	TOTAL	100	100 %

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
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	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study programme: Traffic*** ***Profile: Telecommunications and postal traffic*** II cycle | I year of study	

Course title	**PROJECT MANAGEMENT IN POSTAL TRAFFIC**
Department	Information - Communication Systems in Traffic - Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF12ST03222116,0311	elective	I	6,00

Professor/s	PhD Amel Kosovac, Associate Professor
Associate/s	PhD Amel Kosovac, Associate Professor

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
3	1	1	3*15*1,4=63	1*15*1,4=2 1	1*15*1,4=2 1	1,4

Total teacher workload (hours, per semester) 3*15 + 1*15 + 1*15 = 75 hours	Total student workload (hours, per semester) 3*15*1,4+ 1*15*1,4+ 1*15*1,4= 105 hours

Total workload: $W+T=U_{opt}$= 75 + 105 = 180 hours per semester

Course aims and learning outcomes	By mastering the content of this course, students will be able to: 1. apply the latest knowledge in the field of project and investment management; 2. application of methods and techniques of project and investment management, as well as the latest achievements in theory and practice; 3. recognize and defines the role and place of project and investment management; 4. perform performance improvement in project management.
Prerequisites	None
Teaching methods	Lectures, auditory exercises, laboratory exercises, consultations
Course content	1. Concept and definition of the project. Types of projects. Projects in postal traffic. 2. Project Management according to PMI (Project Management Institute). 3. Project management concept. 4. Project management organization. 5. Human resource management 6. Contract Management 7. Project quality management. 8. Project risk management 9. Project communication management. Project change management. 10. Preparation and evaluation of investments in communications. 11. Investment process management. 12. Project realization planning. 13. Monitoring and control of project implementation. 14. Project realization reporting system. 15. Computer programs for project management. Project management methods and techniques

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Jovanović P.	Upravljanje projektom, Faculty of Organizational Sciences	2004.	
Jovanović P.	Upravljanje investicijama, Grafoslog, Belgrade	2002.	

Additional readings

Author/s	**Name of publication, editor**	**Year**	**Pages (from-to)**
Lock D.	Project management, Gower Press, London, UK	1977.	
Klein R.	Sheduling of resource - constrained projects, Kluwer Academics Publishers, Boston, MA	2000.	

Evaluation criteria	**Assessment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	attendance continued	10	10 %
	activity	5	5 %
	positively graded seminar paper	10	15 %
	Midterm test, End-of-term test	2 x 25	50%
	oral exam	50	50 %
	written exam	25	25 %
	TOTAL	100	100%

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
Applicable from	19.10.2023 - 213th session of the Academic Council, Faculty of Transport and Traffic Engineering Doboj

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study programme: Traffic*** ***Profile: Telecommunications and postal traffic*** II cycle | I year of study	

Course title	**MULTIMEDIA COMMUNICATIONS**
Department	Information - Communication Systems in Traffic - Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF12ST03210516,0311	elective	I	6.0

Professor/s	PhD Aleksandar Stjepanović, Associate Professor
Associate/s	PhD Aleksandar Stjepanović, Associate Professor

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
3	1	1	3*15*1.4=63	1*15*1.4=21	1*15*1.4=21	1.4

Total teacher workload (hours, per semester) 3*15 + 1*15 + 1*15 = 75 hours	Total student workload (hours, per semester) 3*15*1.4 + 1*15*1.4 + 1*15*1.4 = 105 hours

Total workload: $W+T=U_{opt}$= 75 + 105 = 180 hours per semester

Course aims and learning outcomes	1. web applications with technologies of modern multimedia communications 2. distributed multimedia applications 3. "Data mining" of multimedia data in transport 4. quality of service in multimedia communications 5. development of multimedia applications for transport purposes
Prerequisites	None
Teaching methods	Lectures, auditory exercises, laboratory exercises, consultations
Course content	1. The concept of multimedia and multimedia communication in all modes of transport 2. Multimedia elements - image analysis, edge detection, detection of faces, objects 3. Creating multimedia applications for transport purposes-application of HTML, PHP, CSS 4. Multimedia data mining 5. Multimedia communications: modern trends 6. Multimedia web applications - integration with spatial information infrastructure (INSPIRE) 7. Multimedia signal processing: compression techniques 8. Distributed multimedia systems and their application in passenger tracking, control and information systems 9. Multimedia on the Internet-google maps 10. Multimedia communication standards 11. Internet access networks FTTH, ADSL, VDSL, DOCSIS 12. Network structure of multimedia communication systems 13. Quality of service in multimedia communications-QoE user experience, quality of QoS service 14. Automatic image recognition - application in transport (use of tools in Mathlab) 15. 5G mobile communications, multimedia in mobile communications

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
K. R. Rao, Z. S. Bojkovic, D. A. Milovanovic	Multimedia Communication Systems: Techniques,Standards and Networks, Prentice-Hall	2002	

Evaluation criteria	**Assessment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	attendance - lectures / exercises	5	5%
	positively graded seminar paper	15	15%
	Midterm test	15	15%
	End-of.term test	15	15%
	laboratory exercises	10	10%
	Final exam		
	oral	40	40%
	TOTAL	100	100%

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
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	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study programme: Traffic*** ***Profile: Telecommunications and postal traffic*** II cycle | I year of study	

Course title	**COMMUNICATION SYSTEMS IN POSTAL TRAFFIC**
Department	Information - Communication Systems in Traffic - Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF12ST03222216,0311	elective	I	6,00

Professor/s	PhD Amel Kosovac, Associate Professor
Associate/s	PhD Amel Kosovac, Associate Professor

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
3	1	1	3*15*1,4=63	1*15*1,4=21	1*15*1,4=21	1,4

Total teacher workload (hours, per semester) 3*15 + 1*15 + 1*15 = 75 hours	Total student workload (hours, per semester) 3*15*1,4+ 1*15*1,4+ 1*15*1,4= 105 hours
Total workload: 75 + 105 = 180 hours per semester	

Course aims and learning outcomes	By mastering the content of this course the student will acquire and be able to apply: 1. theoretical, 2. professional, 3. practical knowledge in the field of telecommunication technologies, 4. knowledge of systems and networks intended for modern traffic and transport systems.
Prerequisites	There is no prior conditionality
Teaching methods	Lectures, auditory exercises, laboratory exercises, consultations
Course content	1. Introduction to telecommunication systems and their potential applications in traffic and transport. 2. Application of public broadcasting systems (RDS, DAB) in traffic. 3. Public networks for mobile communications. Mobile communications for closed user groups. 4. Dedicated radio networks for data transmission (MOBITEX, TETRA, TRAXYS, ARDIS, RICOCHET). 5. Fixed and mobile wireless IP networks 6. Virtual Private Networks. Radio over optics (ROF). 7. Sensor and ad-hoc networks for traffic monitoring and regulation. Types of sensor technologies 8. Wireless communication systems designed for safe traffic. 9. Dedicated Short Range Communications in Road Traffic (DSRC). Wireless local area networks 10. Satellite communication systems and their applications in traffic. 11. Vehicle positioning, navigation and tracking systems. 12. Communication systems for the needs of electronic payment for services (toll, ticket sales, etc.) 13. GSM-R - global mobile communications system for railway applications 14. Air traffic communication systems. 15. Communication systems in river and maritime traffic. River information services.

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
M. A. Chowdhury, A. Sadek,	Fundamentals of Intelligent Transportation Systems Planning, Artech House,	2003.	
J. Lavergant, M. Sylvain,	Radio Wave Propagation: Principles and Techniques, Wiley, Одабрани чланци из часописа IEEE Vehicular Technology Magazine		

Evaluation criteria	**Assessment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	attendance - lectures / exercises	5	5%
	positively graded seminar paper	15	15%
	Midterm test	15	15%
	End-of.term test	15	15%
	laboratory exercises	10	10%
	Final exam		
	oral exam	40	40%
	TOTAL	100	100 %

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
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	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study programme: Traffic*** ***Profile: Informatics in traffic***	
	II cycle | I year of study	

Course title	**DESIGN AND APPLICATION OF DIGITAL SYSTEMS**
Department	Electronics and Electronic Systems - ETF East Sarajevo

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SI03209316,0311	elective	I	6,0

Professor/s	PhD Goran Kuzmić, Assistant Professor
Associate/s	PhD Goran Kuzmić, Assistant Professor

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
X	Y	Z	X*15*S_o	Y*15*S_o	Z*15*S_o	

Total teacher workload (hours, per semester) W = 3*15 + 1*15 + 1*15 = 45 + 15 + 15 = 75 hours	Total student workload (hours, per semester) T=3*15*1,4 + 1*15*1,4 + 1*15*1,4=63 + 21 + 21=105 hours
Total workload: W + T = U_{opt} = 75+ 105 = 180 hours per semester	

Course aims and learning outcomes	Students will get acquainted with and master the knowledge in the field of: -construction, structure, application of digital systems, -procedures and phases of design, design of combination and sequential systems, -design of digital systems.
Prerequisites	No
Teaching methods	Lectures, auditory exercises, laboratory exercises, consultations
Course content	Introduction. Construction and structure of digital systems. Application of digital systems 2 Procedures and basic stages in digital system design Ways and styles of design. Project documentation 4 Basic parameters of digital circuits and systems Design and application of combination assemblies and systems Components and criteria for selection of real combination systems 7 State Automats and State Diagrams (Colloquium 1) Design and application of sequential assemblies and systems 9 Optimization of real sequential systems Programmable logic circuits and their application in digital system design 11 Combinational and sequential programmable logic components Design approach with microprocessors and microcontrollers 13 Display of a specific microcontroller Hardware and software design support with microcontrollers Independent realization of a small project (Colloquium 2)

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Morshed, Bashir I.	*Embedded Systems-A Hardware-Software Co- Design Approach*. Springer International Publishing.	2021.	
Nayak, Aruna, et al.	Teaching Microcontrollers-using Arduino as a Platform. *IEEE Global Engineering Education Conference (EDUCON)*. IEEE.	2022	
Deepa, M., et al.	Enriched blended learning through virtual experience in microprocessors and microcontrollers course. *Journal of Engineering. Education Transformations*, 34. SP ICTIEE (2021): 642-650.	2021	
Vassiliev, A. E.	Increasing the Accuracy of the Approximation of Microprocessor Fuzzy Solvers Supporting Membership Functions of an Arbitrary Type. Journal of Communications Technology and Electronics 66.3 300-317.	2021	

Additional readings

	Assessment methods	**Points**	**Percentage**
Evaluation criteria	Pre-exam obligations		
	attendance - lectures / exercises	10	10%
	positively evaluated seminar paper	10	10%
	Midterm test	15	15%
	End-of.term test	15	15%
	laboratory exercises	10	10%
	Final exam		
	Theoretical	40	40%
	TOTAL	100	100 %

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
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	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study programme: Traffic*** ***Profile: Informatics in traffic*** II cycle | I year of study	

Course title	**DESIGN OF COMPUTER NETWORKS**
Department	Department of computers, information technologies and biotechnology, ETF, University of East Sarajevo

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SI03224616,0311	elective	I	6,00

Professor/s	PhD Goran Jauševac, Assistant Professor
Associate/s	PhD Goran Jauševac, Assistant Professor

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
3	1	1	63	21	21	1,4

Total teacher workload (hours, per semester) W = 3*15+ 1*15+ 1*15=45 + 15 + 15 =75	Total student workload (hours, per semester) T = 3*15*1,4+ 1*15*1,4+ 1*15*1,4=63+ 21 + 21 = 105
Total workload: W+ T= Uopt= 75+ 105 = 180 hours per semester	

Course aims and learning outcomes	By mastering this course the student will be able to / will be able to: 1. Apply the acquired knowledge in practice, 2. Identifies, formulates and solves problems of practical importance 3. apply different network protocols in practice, 4. plans, installs, uses and maintains networks.
Prerequisites	No
Teaching methods	Lectures and laboratory exercises
Course content	1. Introduction to computer networks 2. Division and topology of networks 3. Network hardware and multimedia networks 4. OSI model and its layers 5. TCP / IP network protocols 6. Ethernet, Token Ring, FDDI, Gigabit Ethernet 7. Connection Oriented Networks (X.25, Frame Relay, ATM) (**I colloquium**) 8. xDSL and CATV 9. 802.3 (WLAN) wireless networks. 802.16 Wireless Networks (WMAN) 10. Bluetooth 802.15 11. IPV4, IPV6 addressing modes 12. DNS, ARP protocols 13. NAT protocol, Firewalls 14. Internet applications used in traffic **15. II colloquium**

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
A.Tanenbaum, D. Wetherall.	Rašunarske mreže, V izdanje, Mikroknjiga, Beograd	2012	
W. Stallings	Computer Networking With Internet Protocols, Prentice-Hall, Inc.	2009	
S. Bigelow	Računartske mreže, instaliranje, održavanje i popravljanje, Mikroknjiga, Beograd	2004	
Vij, V.	Computer Networks. Laxmi Publications Pvt Ltd.	2018	
Salmon, A., Levesque, W., & McLafferty, M.	Applied Network Security. Packt Publishing.	2017	

Additional readings

Author/s	**Name of publication, editor**	**Year**	**Pages (from-to)**

Evaluation criteria	**Assessment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	attendance - lectures	10	10%
	laboratory exercises	10	10%
	Midterm test	20	20%
	End-of.term test	20	20%
	Final exam		
	Writing exam	40	40%
	TOTAL	100	100%

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
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	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study programme: Traffic*** ***Profile: Informatics in traffic*** II cycle of studies | I year of study	

Course title	**DESIGN AND APPLICATION OF INFORMATION SYSTEMS**
Department	Department of Computer and Information Science and Bioinformatics ETF East Sarajevo

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SI03224716,0311	elective	I	6,0

Professor/s	PhD Željko Stjepanović, Full Professor
Associate/s	PhD Željko Stjepanović, Full Professor

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
3	1	1	63	21	21	1,4

Total teacher workload (hours, per semester) 3*15 + 1*15 + 1*15 = 75	Total student workload (hours, per semester) 3*15*1,4 + 1*15*1,4 + 1*15*1,4 = 105

Total workload: $W+T=U_{opt}$= 75 + 105 = 180 hours per semester

Course aims and learning outcomes	1. Use of software for information systems design. 2. Techniques and methods of designing information systems on specific examples. 3. Theoretical bases for the development of information systems in the field of traffic. 4. Information systems and their application in traffic.
Prerequisites	Basics from and Database and Information Systems Design
Teaching methods	Lectures, auditory exercises, laboratory exercises, consultations
Course content	1. Introduction. 2. UML standard, basic elements, diagrams. 3. Diagrams of use cases applied in traffic. 4. Class diagram. 5. Sequence and collaboration diagrams. 6. Methods of object design in traffic. 7. Implementation of information systems in traffic. 8. I colloquium 9. Multi-layer architecture of traffic information system design components. 10. Application of object method. 11. Design of logistics, telecommunications and postal information systems. 12. Design of traffic information systems using class diagrams. 13. Techniques and methods of designing information systems on a concrete example. 14. Use of appropriate standard software environment for multi-layered information systems architectures. 15. II colloquium

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Fowler, M.	UML in a nutshell	2004	

	Assessment methods	**Points**	**Percentage**
Evaluation criteria	attendance - lectures / exercises	5	
	positively graded seminar paper	15	
	Midterm test	15	
	End-of.term test	15	
	laboratory exercises	10	
	Final exam - oral	**40**	
	IN TOTAL	**100**	

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
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	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study programme: Traffic*** ***Profile: Informatics in traffic*** II cycle | I year of study	

Course title	**DESIGN OF MICROPROCESSOR SYSTEMS**
Department	Computers, information technologies and biotechnology, ETF, University of East Sarajevo

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SI02224816,0320	elective	I	6,00

Professor/s	PhD Goran Jauševac, Assistant Professor
Associate/s	PhD Goran Jauševac, Assistant Professor

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
3	1	1	62	21	21	1,4

Total teacher workload (hours, per semester) W = 3*15 + 1*15 + 1*15 = 45 + 15 + 15 = 75 hours	Total student workload (hours, per semester) T = 3*15*1,4 + 1*15*1,4 + 1*15*1,4 = 63 + 21 + 21 = 105 hours
Total workload: U_{opt}= 75+ 105 = 180 hours per semester	

Course aims and learning outcomes	1. Students should acquire knowledge about the functioning of microprocessor systems. 2. Students should acquire knowledge of the principles, methods and tools for designing microprocessor systems. 3. Students should acquire knowledge about the application of microprocessor systems in traffic
Prerequisites	No.
Teaching methods	Lectures. Auditory exercises. Laboratory exercises. Seminary work.
Course content	1. Computer abstractions and technology. 2. Instructions. x86 instructions. 3. Parallelism and synchronization. 4. Logical processor design. 5. Pipeline of data and control. 6. Memory system hierarchy. 7. Virtual machines. 8. Connecting processors, memory and input / output devices. 9. Design of input / output systems. 10. Parallel program execution. 11. Multi-core processors and multi-processors. 12. Shared memory. 13. Clusters. 14. Multiprocessor network topologies. 15. Application of microprocessor systems in traffic.

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
William Stallings	Organizacija i arhitektura računara: Projekat u funkciji performansi. Prevod 9-tog izdanja. CET. Beograd.	2013	
David A. Patterson and John L. Hennessy	Computer organization and design: the hardware/software interface, 4th edition	2012	

Additional readings

Author/s	**Name of publication, editor**	**Year**	**Pages (from-to)**
Kip R. Irvine	Assembly language for x86 processors (6th edition). Pearson Education, Inc., Upper Saddle River, New Jersey, USA.	2011.	

Evaluation criteria	**Assessment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	attendance - lectures / exercises	10	10%
	positively graded seminar paper	40	40%
	laboratory exercises	10	10%
	Final exam		
	Written exam	40	40%
	TOTAL	100	100%

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
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	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study programme: Traffic*** ***Profile: Informatics in traffic*** II cycle / I year of study	

Course title	**ELECTRONIC SYSTEMS IN TRAFFIC**
Department	Information and Communication Systems in Traffic, Faculty of Transport and Traffic Engineering in Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SI03222016,0311	elective	I	6,0

Professor/s	PhD Nataša Đalić
Associate/s	PhD Nataša Đalić

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient So**
L	**TE**	**LE**	**L**	**TE**	**LE**	**So**
3	1	1	63	21	21	1,4

Total teacher workload (hours, per semester) W = 3*15 + 1*15 + 1*15 = 45 + 15 + 15 = 75 hours	Total student workload (hours, per semester) T = 3*15*1,4 + 1*15*1,4 + 1*15*1,4 = 63 + 21 + 21 = 105 hours

Total workload: W + T = Uopt = 75+ 105 = 180 hours per semester

Course aims and learning outcomes	The student will acquire: 1. theoretical knowledge of telecommunication systems and networks and their applications in traffic and transport, 2. expertise in public broadcasting systems (RDS, DAB) in traffic from public broadcasting systems (RDS, DAB) in traffic 3. knowledge in the field of sensor and ad-hoc networks for traffic monitoring and regulation, 4. knowledge of systems and networks intended for modern traffic and transport systems.
Prerequisites	No
Teaching methods	Lectures, auditory exercises, laboratory exercises, consultations
Course content	1 Telecommunication systems and networks and their potential applications in traffic and transport. 2 Application of public broadcasting systems (RDS, DAB) in traffic 3 3 Public networks for mobile communications 4 Mobile communications for closed user groups 5 5 Fixed and mobile wireless IP networks 6 Virtual Private Networks 7 7 Radio over optics (ROF) 8 Sensor and ad-hoc networks for traffic monitoring and regulation 9 9 Systems designed for safe traffic. 10 Satellite communication systems 11 Vehicle positioning and navigation systems 12 Dedicated radio networks for data transmission (MOBITEX, TETRA, TRAXYS, ARDIS, RICOCHET, ARRAY). 13 Dedicated Short Range Communications in Road Traffic (DSRC) 14 GSM-R - global system of mobile communications for railway applications 15 Air transport communications, River information services.

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Ferrari, P., Jakoby, R., Karabey, O. H., Maune, H., & Rehder, G.	Reconfigurable Circuits and Technologies for Smart Millimeter-wave Systems. Cambridge University Press.	2022	
Gumbo, T., Moyo, T., Ndwandwe, B., Risimati, B.,	Urban Public Transport Systems Innovation in the Fourth Industrial Revolution Era: Global South	2022	
& Mbatha, S. G.	Perspectives, Reflections and Conjectures. Springer Nature.		
M. A. Chowdhury, A. Sadek,	Fundamentals of Intelligent Transportation Systems Planning, Artech House,	2003	
H. Lehpamer,	RFID Desing Principles, Artech House,	2008	
J. Lavergant, M. Sylvain,	Radio Wave Propagation: Principles and Techniques, Wiley,	2000	

	Assessment methods	**Points**	**Percentage**
Evaluation criteria	Pre-exam obligations		
	attendance - lectures / exercises	10	10%
	positively evaluated seminar paper	10	10%
	Midterm test	15	15%
	End-of.term test	15	15%
	laboratory exercises	10	10%
	Final exam		
	Theoretical	40	40%
	TOTAL	100	100 %

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
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SUMMER SEMESTER – II CYCLE

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study programme: Traffic*** ***Profile: Road Transport and Traffic*** II cycle | I year of study	

Course title	**TRAFFIC FORECASTS**
Department	Road Transport and Traffic- Faculty of Transport and Traffic Engineering

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SD03218926,0320	elective	II	6,0

Professor/s	PhD Dragan Stanimirović
Associate/s	PhD Dragan Stanimirović

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
3	2	0	3*15*1,4=63	2*15*1,4=42	0*15*1,4=0	1,4

Total teacher workload (hours, per semester) 3*15 + 2*15 + 0*15 = 75	Total student workload (hours, per semester) 3*15*1,4 + 2*15*1,4 + 0*15*1,4 =105

Total workload: $W+T=U_{opt}$= 75+105= 180 hours per semester

Course aims and learning outcomes	1. Acquiring knowledge in the field of application and development of new mathematical traffic demand models. 2. Implementation, improvement and development of mathematical and statistical methods for the traffic demand forecasting. 3. Acquisition of skills determining interdependencies between indicators of socioeconomic development, land using, traffic demand and traffic supply. 4. Acquiring knowledge in the field of using modern computer programs application for the testing transport policy effects and for the alignment of transport demand and supply
Prerequisites	No specific prerequisities
Teaching methods	Lectures, practical laboratory and computational exercises. This course enables students to perform independent assignment seminar paper and examination through partial examinations.
Course content	1. Basic concepts and definitions of traffic demand. 2. Temporal and spatial concentration of demand: causes and consequences. 3. Basic concepts of prediction and forecasting. 4. The importance and role of forecasts and / or prediction of traffic planning. 5. Methods and procedures of forecasting: time series, regression analysis, cross classification - category analysis. 6. Application of the theory of probability to forecast traffic demand. 7. Statistical evaluations of forecast results. 8. Basic concepts and definitions of traffic supply, transport ability of vehicles, supply elements of transport networks. 9. Alignment methods of transport demand and supply. 10. Critical analysis of classical four step model. 11. Target modal split model. 12. Activity based models. 13. Tour-based models. 14. Computer programs for testing and simulation of the harmonization effects of transport demand and supply. 15. Appraisal of transport models.

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Ortuzar, J.D., Willumsen, L.G.	Modelling Transport, Wiley, Chichester	2011.	

Additional readings

Author/s	**Name of publication, editor**	**Year**	**Pages (from-to)**
F.Koppelman, C.Bhat	A self Instructing Course in Mode Choice Modeling: Multinomial and Nested Logit Models, U.S. Department of Transportation	2006.	-
Banister, D.	Transport Planning, Spon Press, New York	2002.	-

Evaluation criteria	**Assessment methods**	**Points**	**Percentage**
	Pre-examination obligations		
	Lecture attendance	5	
	Exercise attendance	5	
	Term paper	20	
	Final examination		
	Final exam	70	
	TOTAL	100	

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
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	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study programme: Traffic*** ***Profile: Road Transport and Traffic*** II cycle | I year of study	

Course title	**TRAFFIC REGULATION AND MANAGEMENT**
Department	Road Transport and Traffic- Faculty of Transport and Traffic Engineering

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SD03219026,0320	elective	II	6,0

Professor/s	PhD Marko Subotić
Associate/s	PhD Dunja Radović Stojčić

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
3	2	0	3*15*1,4=63	2*15*1,4=42	0*15*1,4=0	1,4

Total teacher workload (hours, per semester) 3*15 + 2*15 + 0*15 = 75	Total student workload (hours, per semester) 3*15*1,4 + 2*15*1,4 + 0*15*1,4 =105

Total workload: $W+T=U_{opt}$= 75+105= 180 hours per semester

Course aims and learning outcomes	1. knowledge of concepts and definitions of traffic regulation and management 2. to enable students to regulate and manage road traffic systems 3. Students master certain tools for traffic management 4. They apply the acquired knowledge in practice
Prerequisites	None
Teaching methods	Lectures, auditory exercises, laboratory-computer exercises and demonstration exercises on the street network. Mastering the material: learning, tests, assignments and consultations
Course content	1. Basic concepts of traffic regulation and management 2. Development of a system for regulating and managing traffic 3. Traffic management tools 4. Dependent and semi-dependent systems 5. Traffic management via classic detectors and controllers 6. Traffic management via video surveillance 7. Traffic management with help of radar systems 8. Principles and procedures of traffic management 9. Traffic management system planning 10. Regulation and management of traffic at isolated intersections 11. Traffic management on city roads and corridors 12. Traffic management on the street network 13. Specific cases 14. Functional and economic justification of the introduction of traffic management systems 15. Directions of development of the system for traffic regulation in the future

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Ђорђевић Т.:	Регулисање саобраћајних токова светлосном сигнализацијом, Институт за путеве, Београд	1997.	-
Washinton D.C.:	Highway Capacity Manual, Transportation Research Board	2011.	-

Evaluation criteria	**Assessment methods**	**Points**	**Percentage**
	Pre-examination obligations		
	attendance		5 %
	activity	5	5 %
	Tests	10	10 %
	Seminar paper	20	20 %
	Midterm Test	15	15 %
	End of the Term test	15	15 %
	Students who pass all tests are exempted from the written part of the examination.		
	Final exam		
	Final exam (written)	60	60 %
	TOTAL	100	100 %

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
Applicable from	19.10.2023 - 213th session of the Academic Council, Faculty of Transport and Traffic Engineering Doboj

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering ***Study programme: Traffic*** ***Profile: Road Transport and Traffic*** II cycle | I year of study	

Course title	**TRAFFIC DESIGN - ENGINEERING OF STREET SYSTEMS**
Department	Department of Road Transport and Traffic- Faculty of Transport and Traffic Engineering

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SD03219126,0320	elective	II	6,0

Professor/s	PhD Marko Subotić
Associate/s	PhD Dunja Radović Stojčić

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
3	2	0	3*15*1,4=63	2*15*1,4=42	0*15*1,4=0	1,4

Total teacher workload (hours, per semester) 3*15 + 2*15 + 0*15 = 75	Total student workload (hours, per semester) 3*15*1,4 + 2*15*1,4 + 0*15*1,4 =105

Total workload: $W+T=U_{opt}$= 75+105= 180 hours per semester

Course aims and learning outcomes	1. knowledge of research methodology and design of advanced solutions in traffic 2. knowledge and application of advanced solutions in the field of HS, VS, LS 3. independent preparation of technical project documentation (projects) for advanced solutions 4. independent work on calculations and optimization of more complex systems of light signals
Prerequisites	Completed the course Traffic Design I cycle
Teaching methods	Lectures, debates, graphic exercises, independent seminar papers
Course content	1. Introduction, spatial program elements, advanced approach to design 2. Pavement and pavement speech - examples 3. Engineering of street systems, complex intersections 4. Development and application of vertical signaling, advanced systems 5. Development and application of horizontal signalization, advanced solutions 6. Development and application of light signals on streets and roads, telematics, etc. 7. Complex light signal management systems, zones and line coordination 8. Passages of roads through settlements, problems and shaping 9. Conventional and unconventional intersection solutions 10. LOW COAST measures for roads and road passes through settlements 11. Street furniture (street ferniture), road lighting 12. Security of public spaces 13. Human engineering in cities 14. Examples of good practice in street engineering 15. IT engineering on the street network, cities of the future

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Stephen Ezell	Intelligent Transportation Systems	2010.	1 - 45
Papageorgiou M.	A Concise Encyclopaedia of Road Traffic Pergamon Press	1993.	-
Rahul Kala	On-Road Intelligent Vehicles - Motion Planning for Intelligent Transportation Systems (конгрес)	2016.	1 - 503
George Papageorgiou, Athanasios Maimaris	Modelling, Simulation Methods for Intelligent Transportation Systems	2006.	101 - 119
Walloth, Christian, Gurr, Jens Martin, Schmidt, J. Alexander	Understanding Complex Urban Systems: Multidisciplinary Approaches to Modeling	2014.	-
Intelligent Transportation Systems (ITS) - Joint Program Office (JPO)	ITS Photos Courtesy of USDOT 2015 – 2019 STRATEGIC PLAN	2014.	1 - 82

Additional readings

Author/s	**Name of publication, editor**	**Year**	**Pages (from-to)**
ДИТ Србије	Часопис ТЕХНИКА – сепарат САОБРАЋАЈ	2011.	-
Српско друштво за путеве	Часопис Пут и саобраћај	2011.	-
EUROFILE	Часопис WORD HIGHWAYS	2011.	-

	Assessment methods	**Points**	**Percentage**
Evaluation criteria	Pre-examination obligations		
	attendance	10	10 %
	positively graded semester paper	30	30 %
	Final exam		
	Final exam (written)	60	60 %
	TOTAL	100	100 %

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
Applicable from	19.10.2023 - 213th session of the Academic Council, Faculty of Transport and Traffic Engineering Doboj

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study programem:*** **Traffic** ***Profile:*** **Railway traffic** II cycle | I year of study	

Course title	**RISK ANALYSIS**
Department	Transport Engineering – Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SŽ03220426,0311	elective 4	II	6.00

Professor/s	PhD Ratko Đuričić, Full Professor
Associate/s	MSc Sanja Simić

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**L**
3	1	1	3*15*1,4=63	1*15*1,4=21	1*15*1,4=21	1,4

Total teacher workload (hours, per semester)3*15 + 1*15 + 1*15 = 75 hours	Total student workload (hours, per semester)3*15*1,4 + 1*15*1,4 + 1*15*1,4 = 105 hours

Total workload: W+T=U_{opt} = 75 + 105 = 180 hours per semester

Course aims and learning outcomes	By mastering this course the student will be able / able to: 1. Perform risk identification; 2. Assess and manage risk; 3. Risk management at the enterprise level; 4. Apply the acquired knowledge in practice.
Prerequisites	None
Teaching methods	Lectures, auditory and calculation exercises, consultations
Course content	1. Risk identification. Risk classification - probability of events, impact assessment. 2. Risk analysis and methods for risk analysis 3. Modeling and simulation of risk as a basis for risk management 4. Risk assessment and risk management. Evaluation, acceptability, risk measures, possibility of reduction, evaluation of options, role of cost / benefit analysis 5. Static and adaptive risk control strategies 6. Risk modeling - uncertainty, probability of events, simulations, "what-if", "decision tree". 7. The impact of uncertainty on decision making. Ways of making decisions. 8. The concept of acceptable risk and social norms. Qualitative and quantitative safety objectives. 9. Risk evaluation: an overview of the basic principles of financial management. 10. Financial estimates in decision making - present value, rate of return on capital, capital flow. Project planning and financing in conditions of uncertainty. 11. Risk management in a neutral sense and under the influence of risk perception. 12. Integral risk management: scenarios and Total consequences. 13. Incorporate multiple objectives into risk analysis and management 14. Risk assessment and risk management during the introduction of new technologies. 15. Enterprise risk management to reduce impacts on organizational structure and financial performance due to potential negative internal and external factors

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Dale F. Cooper, Stephen Grey	*Geoffrey Raymond*, Phil Walker	2004	
Project Risk ManagementGuidelines	*Managing Risk in Large Projects and ComplexProcurements*,John Wiley	2004	

	Assessment methods	**Points**	**Percentage**
Evaluation criteria	Pre-exam obligations		
	Attendance - lectures	10	10%
	Positively evaluated seminar paper	20	20%
	Exam/test	30	30%
	Final exam		
	Final exam(orsl)	40	40%
	Total	100	100%

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
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	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study programem:*** **Traffic** ***Profile:*** **Railway traffic** II cycle | I year of study	

Course title	**MODELING IN RAILWAY TRANSPORT**
Department	Transport Engineering – Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SŽ03220526,0311	electivel 4	II	6.00

Professor/s	PhD Predrag Jovanović, Associate Professor
Associate/s	Vladimir Malčić, Senior Assistant

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**L**
3	1	1	3*15*1,4=63	1*15*1,4=21	1*15*1,4=21	1,4

Total teacher workload (hours, per semester)3*15 + 1*15 + 1*15 = 75 hours	Total student workload (hours, per semester)3*15*1,4 + 1*15*1,4 + 1*15*1,4 = 105 hours

Total workload: W+T=U_{opt} = 75 + 105 = 180 hours per semester

Course aims and learning outcomes	Basic aim of the subject is to enable students to apply different models for railway transport and traffic optimization of organization, technology, and capacity. After the course each student should be able tounderstand and describe basic methods for solving the problems of railway organization and technology and to apply specific optimization model. Also, student should be able to understand and use specific software applications related to operations research and statistics. The best students will be able to define a problem and solve it by contemporary software tools and methods.
Prerequisites	None
Teaching methods	Lectures, auditory exercises, seminary work, consultations
Course content	1. Generally about Modeling 2. Generally about Prediction and selecting factors, 3. Methods and Models of Prediction 4. Phase in process of prediction and application methods and models 5. Optimization of Capacity 6. Method "Monte Carlo" 7. Problems of Capacity Allocation and Assignment 8. I colloquium 9. Basic in Decision Theory 10. Decision in Risk Condition 11. Multi-Criteria Decision Making (MCDM) 12. Examples of MCDM 13. Methods of multicriteria analysis 14. Applications of Multi-Criteria Analysis in Railway Transport 15. II colloquium

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Mirko J. Čičak:	Modeling in rail traffic (Modeliranje u železničkom saobraćaju), Faculty of Transport and Trafficengineering and ŽELNID, Belgrade	2003	11-28; 31-75; 463-502
Čupić M., Rao Tumala V.M.	Contemporary decision making - methods and application (Savremeno odlučivanje – metode i primena), III edition, FON, 1997, Belgrade	1997	1-57; 271-288

	Assessment methods	**Points**	**Percentage**
Evaluation criteria	Pre-exam obligations		
	Attendance during lectures	10	10%
	Positively evaluated project work	20	20%
	Test (tasks)	20	20%
	Test (theory)	20	20%
	Final exam		
	Final exam(oral)	30	30%
	Total	100	100%

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
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	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study programme: Traffic*** ***Profile: Logistics*** II cycle | I year of study	

Course title	**SPECIAL AREAS OF CITY LOGISTICS**
Department	Transport Engineering - Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SL03221426,0320	elective 3	II	6.00

Professor/s	PhD Snežana Tadić, Associate Professor
Associate/s	PhD Snežana Tadić, Associate Professor

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
3	2	0	3*15*1,4=63	2*15*1,4=42	0*15*1,4=0	1,4

Total teacher workload (hours, per semester)3*15 + 2*15 +0*15 = 75	Total student workload (hours, per semester)3*15*1,4+ 2*15*1,4+ 0*15*1,4= 105
Total workload: W+T=U_{opt}= 75 + 105 = 180 hours per semester	

Course aims and learning outcomes	1. Defines the structure of the city logistics database; 2. Choose the optimal concept of city logistics for individual activities and the entire city system; 3. Creates intermodal solutions for different structures of logistics requirements in the city; 4. Identifies and quantifies the effects of the city logistics solution.
Prerequisites	None
Teaching methods	lectures, tutorials, case studies, debate classes
Course content	1. Integrated concepts of city logistics; 2. Concepts of city logistics of trade and industrial companies; 3. Concepts of city logistics of construction and service companies; 4. Concepts of city logistics of clinical facilities, cultural, administrative institutions, etc. 5. Methodology of forming the city logistics performance base; 6. Techniques and methods for determining the parameters of city logistics; 7. Modeling of city logistics flows through the city logistics terminal. Colloquium 1. 8. Intermodal transport systems in city logistics. 9. Underground transport systems. 10. Application of hub & spoke concept in city logistics. 11. The concept of integration of courier-express shipments in the city. 12. Models of justification for the construction of a city logistics terminal. 13. City logistics and sustainable city development. 14. City logistics and smart cities. 15. Examples of world experiences in city logistics solutions. Colloquium 2.

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Tadić S., Zečević S.	Modeliranje koncepcija city logistike	2016	-
Zečević S., Tadić S.	City logistika, Saobraćajni fakultet Doboj	2013	-

Additional readings

Hesse M.	The City as a Terminal - The Urban Context of Logisticsand Freight Transport,Ashgate Publishing Ltd	2012	-
Rushton A.	The Handbook of Logistics andDistributionManagement, Kogan Page Publishers	2010	-

Evaluation criteria	**Assessment methods**	**Points**	**Percentage**
	Preexamination obligations		
	attendance - lectures/exercise	10	10%
	seminar paper	30	30%
	Midterm test	20	20%
	End-of.term test	20	20%
	Final examination		
	oral examination	20	30%
	Total	100	100%

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
Applicable from	19.10.2023 - 213th session of the Academic Council, Faculty of Transport and Traffic Engineering Doboj

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study programme: Traffic*** ***Profile: Logistics*** II cycle | I year of study	

Course title	**GOODS TERMINALS**
Department	Transport Engineering - Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SL03221526,0320	elective 3	II	6.00

Professor/s	PhD Snežana Tadić, Associate Professor
Associate/s	PhD Snežana Tadić, Associate Professor

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient So**
L	**TE**	**LE**	**L**	**TE**	**LE**	**So**
3	2	0	3*15*1,4=63	2*15*1,4=42	0*15*1,4=0	1,4

Total teacher workload (hours, per semester)3*15 + 2*15 +0*15 = 75	Total student workload (hours, per semester)3*15*1,4+ 2*15*1,4+ 0*15*1,4= 105
Total workload: W+T=Uopt= 75 + 105 = 180 hours per semester	

Course aims and learning outcomes	1. knowledge of concepts and definitions of goods flows 2. to acquaint the student with the basic types and structures of logistics flows and logistics centers 3. Introducing students to the preparation of studies on the structural and spatial functions of various categories of terminals and logistics centers 4. apply the acquired knowledge in practice
Prerequisites	None
Teaching methods	lectures, tutorials, case studies, debate classes
Course content	1. Transformations of commodity flows 2. Types of freight terminals - logistics centers 3. Objectives of development of freight transport centers 4. Terminal gravity zone parameters 5. Criteria and procedure for selecting the macro and micro location of the terminal 6. Analysis of flows through the logistics center 7. Structure of functions and subsystems of the freight transport center 8. Analysis of requirements for dimensioning of freight terminal subsystems 9. Technological and spatial characteristics of logistics centers (terminal for different types of goods, customs terminal, dangerous goods terminal, container terminal, border terminal, goods and trade center, distribution center, cross-docking terminal, goods and transport center, etc.). 10. Integrated free zone and logistics center concept 11. Cooperation in logistics chains through the freight and transport center 12. Procedure for determining the characteristics of goods flows in the gravity zone of the terminal 13. Analysis and quantification of logistic requirements for terminal subsystems in deterministic stochastic conditions 14. Quantitative-spatial analysis of terminal subsystems 15. Examples of elaboration of structural-spatial functions of various categories of terminals and logistics centers

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Zecevic, S.	Robni terminali i robno-transportni centri	2006.	

	Assessment methods	**Points**	**Percentage**
Evaluation criteria	Preexamination obligations		
	attendance -lectures/exercise	10	10%
	seminar paper	20	20%
	Midterm test	15	15%
	End-of.term test	15	15%
	Final examination		
	oral examination	40	40%
	Total	100	100%

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
Applicable from	19.10.2023 - 213th session of the Academic Council, Faculty of Transport and Traffic Engineering Doboj

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering ***Study programme: Traffic*** ***Profile: Logistics*** II cycle | I year of study	

Course title	**INTERMODAL TRANSPORT TECHNOLOGIES**
Department	Transport Engineering - Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SL03221626,0320	elective 4	II	6.00

Professor/s	PhD Snežana Tadić, Associate Professor
Associate/s	PhD Snežana Tadić, Associate Professor

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
3	2	0	3*15*1,4=63	2*15*1,4=42	0*15*1,4=0	1,4

Total teacher workload (hours, per semester)3*15 + 2*15 +0*15 = 75	Total student workload (hours, per semester)3*15*1,4+ 2*15*1,4+ 0*15*1,4= 105
Total workload: $W+T=U_{opt}$= 75 + 105 = 180 hours per semester	

Course aims and learning outcomes	1. knowledge of concepts and definitions of intermodal transport 2. that the student gets acquainted with the basic requirements of the commodity flows market interms of the application of intermodal technologies 3. Introducing students to the simulation experiment of the operation of the container terminal 4. apply the acquired knowledge in practice
Prerequisites	None
Teaching methods	lectures, tutorials, case studies, debate classes
Course content	1. Segmentation of the intermodal transport market (international, regional, national aspect) 2. Modeling of goods flows in intermodal transport networks 3. Rolling Shelf technology 4. Trends and requirements for standards of intermodal transport units 5. Analysis and planning of IT quality performance 6. Benchmarking in intermodal transport 7. New generations of intermodal transport networks and terminals. Development of a model for the optimal location of intermodal terminals 8. Concepts of connecting maritime and land intermodal transport. Dry port concept 9. Concepts of transport of intermodal terminals. Optimization and adaptation of certain modes of transport to IT requirements 10. Methodology of forming a database for IT 11. Methodology for calculating the logistics costs of intermodal transport chains 12. Scenarios of strategic development of European intermodal transport 13. Requirements for the design of telematics systems in IT 14. Simulation experiment of container terminal operation 15. Introduction to software packages for planning and managing the operation of container terminals. IT terminal location studies

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Lowe D.:	Intermodal freight transport, Elsevier	2005.	-
Bontekoning Y.:	Hub exchange operations in intermodal hub-and-spokenetworks, IOS/Delph	2006.	-

Evaluation criteria	**Assessment methods**	**Points**	**Percentage**
	Preexamination obligations		
	attendance - lectures/exercises	5	5%
	activity	5	5%
	seminar paper	15	15%
	Midterm test	20	20%
	End-of.term test	20	20%
	Final examination		
	oral examionation	35	35%
	Total	100	100%

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
Applicable from	19.10.2023 - 213th session of the Academic Council, Faculty of Transport and Traffic Engineering Doboj

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering ***Study programme: Traffic*** ***Profile: Logistics*** II cycle | I year of study	

Course title	**LOGISTICS ORGANIZATION DESIGN**					
Department	Transport Engineering - Faculty of Transport and Traffic Engineering Doboj					
Code			**Course status**	**Semester**		**ECTS credits**
SAF12SL03221726,0320			elective 4	II		6.00
Professor/s	PhD Željko Stević, Associate Professor					
Associate/s	PhD Željko Stević, Associate Professor					
Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
3	2	0	3*15*1,4=63	2*15*1,4=42	0*15*1,4=0	1,4
Total teacher workload (hours, per semester)3*15 + 2*15 +0*15 = 75			Total student workload (hours, per semester)3*15*1,4+ 2*15*1,4+ 0*15*1,4= 105			
Total workload: $W+T=U_{opt}$= 75 + 105 = 180 hours per semester						
Course aims and learning outcomes	1. knowledge of concepts and definitions of the science of organization 2. Introducing students to design in the organization of logistics 3. Introducing students to macro and micro logistics models 4. apply the acquired knowledge in practice					
Prerequisites	None					
Teaching methods	lectures, tutorials, case studies, debate classes					
Course content	1. Fundamentals of organizational science 2. Historical bases of development of the science of organization 3. Three main schools of organization theory 4. Modern theories of organization and management 5. The concept and definitions of organization 6. Organization of logistics 7. Trends and approaches of logistics organization 8. Tasks and goals of design in logistics 9. Design of logistics centers 10. Macro and micro planning and design in logistics 11. Methodology of design and planning in logistics 12. Macro and micro logistics models 13. Models of stochastic quantification of logistics centers 14. Procedures for optimizing the flow of materials and goods by order principles 15. Methodological principles of designing individual subsystems					

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Станивуковић Д.:	Логистика-организација и менаџмент, Биљешке сапредавања, Нови Сад	2003	-
Rupper P.:	Transport, Lager und Logistic, Verlag Industrielleorganisation, Zurich	1990	-

	Assessment methods	**Points**	**Percentage**
Evaluation criteria	Preexamination obligations		
	activity	10	10%
	project	25	25%
	Midterm test	15	15%
	End-of.term test	20	20%
	Final examination		
	oral examionation	30	30%
	Total	100	100%
Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf		
Applicable from	19.10.2023 - 213th session of the Academic Council, Faculty of Transport and Traffic Engineering Doboj		

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study program: Traffic*** ***Profile: Logistics*** II cycle | I year of study	

Course title	**WAREHOUSE SYSTEMS MANAGEMENT**
Department	Transport Engineering - Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SL03221826,0320	Elective 4	II	6.00

Professor/s	PhD Željko Stević, Associate Professor
Associate/s	PhD Željko Stević, Associate Professor

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
3	2	0	3*15*1,4=63	2*15*1,4=42	0*15*1,4=0	1,4

Total teacher workload (hours, per semester)3*15 + 2*15 +0*15 = 75	Total student workload (hours, per semester)3*15*1,4+ 2*15*1,4+ 0*15*1,4= 105
Total workload: W+T=U_{opt}= 75 + 105 = 180 hours per semester	

Course aims and learning outcomes	1. knowledge of concepts and definitions of storage systems management 2. should enable students to master the basic concepts of engineering graphics 3. students should be able to master the basic software tools of engineering design with application to the management of warehouse processes 4. apply the acquired knowledge in practice
Prerequisites	None
Teaching methods	lectures, tutorials, special exercise at warehouse system
Course content	1. Introduction to storage systems management 2. Data storage. 3. Process management in warehouses 4. Inventory management 5. Inventory optimization methods 6. Dimensioning of technological elements of the warehouse 7. Mathematical models for quantification of technological requirements and sizing of technological elements of the warehouse 8. Theory of queuing systems 9. Models of simulation of real processes in warehouses 10. Dimensioning of technological elements of the storage system 11. Evaluation of variant technological solutions 12. Multicriteria analysis 13. Electre Method I 14. Methods of Promothee I-IV 15. AHP method

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
S. Vukičević	Skladišta. Univerzitet u Beogradu, Saobraćajni fakultet	1995	-

	Assessment methods	**Points**	**Percentage**
Evaluation criteria	Preexamination obligations		
	attendance - lectures/exercise	10	10%
	Seminar paper	10	10%
	Midterm test	15	15%
	End-of.term test	15	15%
	Final examination		
	oral examination	50	50%
	Total	100	100%

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
Applicable from	19.10.2023 - 213th session of the Academic Council, Faculty of Transport and Traffic Engineering Doboj

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study program: Traffic*** ***Profile: Telecommunications and postal traffic*** II cycle | I year of study	

Course title	**SELECTED CHAPTERS IN THE FIELD OF TELECOMMUNICATIONS**
Department	Information and communication technologies

Code	**Course status**	**Semester**	**ECTS credits**
SAF12ST03222326,0311	Elective	II	6,00

Professor/s	Assistant professor PhD Suzana Miladić-Tešić
Associate/s	Assistant professor PhD Suzana Miladić-Tešić

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
3	1	1	3*15*1,4=63	1*15*1,4=21	1*15*1,4=21	1,4

Total teacher workload (hours, per semester) 3*15 + 1*15 + 1*15 = 75 hours	Total student workload (hours, per semester) 3*15*1,4 + 1*15*1,4 + 1*15*1,4 = 105 hours

Total workload: $W+T=U_{opt}$= 75 + 105 = 180 hours per semester

Course aims and learning outcomes	Upon completion of the course, student will: 1. Gain theoretical knowledge on selected topics in the field of telecommunications 2. Be able to perform analysis and synthesis of selected modern communication systems 3. Gain knowledge on the exploitation of modern communication systems 4. Gain theoretical knowledge on the application of modern communication systems in traffic and transport.
Prerequisites	None
Teaching methods	Lectures, theoretical and laboratory exercises, consultations
Course content	1. Design principles of modern digital telecommunication systems 2. Development trends of modern telecommunication systems 3. New telecommunication technologies and services 4. Optical transmission systems 5. Radio communication systems 6. Operation of telecommunication systems 7. I test 8. Modern telecommunication networks 9. Intelligent networks and services, edge-cloud concept 10. Telecommunication infrastructure for the needs of intelligent traffic systems 11. Telecommunication infrastructure for the needs of smart cities 12. Internet access within vehicle communication systems. IoV paradigm 13. V2X communications and IoV environment 14. Optical networking for monitoring and traffic management purposes. Communication requirements of specific applications. 15. II test

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
M. L. Dukić	Principles of Telecommunications, Academic Mind Belgrade	2014	-
M. Elhoseny, A. E. Hassanien	Emerging Technologies for Connected Internet of Vehicles and Intelligent Transportation System Networks: Emerging Technologies for Connected and Smart Vehicles, Springer	2020	-
R. I. Meneguette, R. E. De Grande, A. A. F. Loureiro	Intelligent Transport Systems in Smart Cities – Aspects and Challenges of Vehicular Networks and Cloud, Springer	2018	-

Additional readings

Author/s	**Name of publication, editor**	**Year**	**Pages (from-to)**
	Selected journal and conference papers in the field	Newer releases	

	Assessment methods	**Points**	**Percentage**
Evaluation criteria	Pre obligations		
	Positively evaluated seminar paper	30	30 %
	Test I	15	15 %
	Test II	15	15 %
	Final examination		
	Final examination (oral/written)	40	40 %
	TOTAL	100	100 %

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
Applicable from	19.10.2023 - 213th session of the Academic Council, Faculty of Transport and Traffic Engineering Doboj

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study programme: Traffic*** ***Profile: Telecommunications and postal traffic*** II cycle | I year of study	

Course title	**APPLICATION OF RENEWABLE ENERGY SOURCES IN TRANSPORT SYSTEMS**
Department	Information and Communication Systems in Traffic, Faculty of Transport and Traffic Engineering in Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF12ST03222526,0311	elective	II	6,0

Professor/s	PhD Slobodan Lubura, Full Professor
Associate/s	PhD Slobodan Lubura, Full Professor

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
3	1	1	3*15*1,4=63	1*15*1,4 =21	1*15*1,4 =21	1,4

Total teacher workload (hours, per semester) 3*15 + 1*15 + 1*15 = 75 hours	Total student workload (hours, per semester) 3*15*1,4+ 1*15*1,4+ 1*15*1,4= 105 hours
Total workload: W + T = U_{opt} = 75+ 105 = 180 hours per semester	

Course aims and learning outcomes	The student will be able to: 1. monitors trends in the field of renewable energy sources, 2. acquires basic knowledge of alternative propulsion in vehicles, 3. differs in the construction of electric vehicles and hybrid vehicles, 4. monitors the economic aspects of the application of alternative power sources in transport.
Prerequisites	None
Teaching methods	Lectures, auditory exercises, laboratory exercises, consultations
Course content	1. Introduction: Energy. Renewable sources of energy. Environmental protection. Trends in the world, EU and BiH. 2. Legislation. 3. Solar energy: Basic properties of solar radiation. Converting solar energy into electricity. 4. Solar energy: Practical examples. Economic significance. World trends. EU and BIH 5. Electric vehicles. Types of electric vehicles 6. Fully electric vehicles (EV). Hybrid Electric Vehicles (HEV) 7. Sources of electricity. Modern batteries and autonomy of electric vehicles 8. Charging the battery. Solar cells, fuel cells and reformers 9. Modern heat engines. 10. Construction of EV and HEV 11. Specifics of EV construction 12. Ecology and HEV 13. HEV development trends 14. Alternative energy sources and new fuels 15. Energy from biomass

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Labudović, B.	Renewable energy sources, Energy marketing, Zagreb.	2002	
Šljivac, D., Šimić, Z.	Renewable energy sources with a focus on management, textbook, ETF Osijek.	2008	

Evaluation criteria	**Assessment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	attendance- lectures / exercises	5	5%
	positively evaluated seminar paper	15	15%
	Midterm test	15	15%
	End-of.term test	15	15%
	laboratory exercises	10	10%
	Final exam		
	Theoretical	40	40%
	TOTAL	100	100 %

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
Applicable from	19.10.2023 - 213th session of the Academic Council, Faculty of Transport and Traffic Engineering Doboj

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study programme: Traffic*** ***Profile: Informatics in traffic*** II cycle | I year of study	

Course title	**NETWORK MANAGEMENT AND SERVICES**
Department	Computers, information technologies and biotechnology, ETF, University of East Sarajevo

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SI03210326,0311	elective	II	6,00

Professor/s	PhD Goran Jauševac, Assistant Professor
Associate/s	PhD Goran Jauševac, Assistant Professor

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
3	1	1	63	21	21	1,4

Total teacher workload (hours, per semester) W = 3*15+ 1*15+ 1*15=45 + 15 + 15 =75	Total student workload (hours, per semester) T = 3*15*1,4+ 1*15*1,4+ 1*15*1,4=63+ 21 + 21 = 105
Total workload: W+ T= Uopt= 75+ 105 = 180 hours per semester	

Course aims and learning outcomes	By mastering this course the student will be able to / will be able to: 1. Master the basic techniques of network and service management. . Master the basic techniques of maintaining telecommunications and computer networks and services. . To use various application software for management and design of telecommunication networks (eg Opnet, Cisco Packet Tracer, ...). 4. Configure and manage the telecommunication networks.
Prerequisites	None
Teaching methods	Lectures and laboratory exercises
Course content	1. Introduction. Changing the maintenance philosophy according to the maintenance concept 2. Processes in telecommunications 3. International organizations and standards in the field of network and service management 4. Principles of telecommunications management 5. TMN 6. TCP / IP protocols (**Midterm test**) 7. Platforms for management implementation 8. ITU-U recommendations 9. Application of the concept of network and service management 10. Management tools 11. SDH management 12. ATM management 13. GSM and UMTS management 14. Service management: TOM and eTOM 15. **End-of-term test**

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
A.Tanenbaum, D. Wetherall.	Rašunarske mreže, V izdanje, Mikroknjiga, Beograd	2012	
Held, G.	Understanding Data Communications (3rd Edition), J. Wiley & Sons	2001.	
Held, G.	Internetworking LANs and WANs (2nd Edition), J. Wiley & Sons	2001.	

Evaluation criteria	**Assessment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	attendance - lectures	10	10%
	laboratory exercises	10	10%
	Midterm test	20	20%
	End-of.term test	20	20%
	Final exam		
	Writing exam	40	40%
	TOTAL	100	100%

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
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UNIVERSITY OF EAST SARAJEVO
Faculty of Transport and Traffic Engineering Doboj
Study programme: Traffic
Profile: Informatics in traffic

II cycle	I year of study

Course title	**APPLICATION OF GIS**
Department	Information - Communication Systems in Traffic - Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SI03223826,0311	elective	II	6.0

Professor/s	PhD Ljubiša Preradović, Full Professor
Associate/s	PhD Ljubiša Preradović, Full Professor

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
3	1	1	63	21	21	1,4

Total teacher workload (hours, per semester)	Total student workload (hours, per semester)
3*15 + 1*15 + 1*15 = 75 hours	3*15*1.4 + 1*15*1.4 + 1*15*1.4 = 105 hours

Total workload: $W+T=U_{opt}$= 75 + 105 = 180 hours per semester

Course aims and learning outcomes	After successfully mastering the content of the course, the student will be able to: -models spatial objects, -decomposes the elements of space, -work with GIS tools
Prerequisites	None
Teaching methods	Lectures, auditory exercises, laboratory exercises, consultations
Course content	The place and role of geoinformation systems (GIS). Introduction to GIS. Basic concepts and terminology. Geospatial data infrastructure. Spatial reference frames. Spatial object modeling, GIS data model, raster and vector models, geometry, topology and topography of space. Decomposition of space elements. GIS system architecture. Space databases. Interpretation and presentation of spatial data. Midterm test Introduction to geospatial data visualization. Spatial analysis. GIS tools. Standardization in the field of geoinformation systems and technologies - OpenGis, ISO TC2 Service Oriented Architecture. GIS - three-layer architecture. Application of standards in the implementation of GIS systems. Applications of GIS systems in different areas. End-of-term test

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
C. Jones,	Geographical Information Systems and Computer Cartography, Pearson Education Inc.	1997.	
S. Shekhar, S. Chawla,	Spatial Databases: A Tour, Pearson Education Inc	2003.	
Peter A. Burrough, Rachael A. McDonnell,	Principi geografskih informacionih sistema, Građevinski fakultet Beograd	2006.	
Keith R. McCloy	Resource Managament Information Systems Remote Sensing, GIS and Modelling, Taylor & Francis	2006.	

Additional readings

Evaluation criteria	**Assessment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	Attendance - lectures / exercises	5	5%
	Positively graded seminar paper	15	15%
	Midterm test	15	15%
	End-of.term test	15	15%
	Laboratory exercises	10	10%
	Final exam		
	Oral examination	40	40%
	TOTAL	100	100%

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
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	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study programme: Traffic*** ***Profile: Informatics in traffic*** II cycle | I year of study	

Course title	**WIRELESS SENSOR NETWORKS**
Department	Electronics and Electronic Systems, ETF, University of East Sarajevo

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SI03224926,0311	elective	I	6,00

Professor/s	PhD Miroslav Kostadinović
Associate/s	PhD Miroslav Kostadinović

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
3	1	1	63	21	21	1,4

Total teacher workload (hours, per semester) W = 3*15+ 1*15+ 1*15=45 + 15 + 15 =75	Total student workload (hours, per semester) T = 3*15*1,4+ 1*15*1,4+ 1*15*1,4=63+ 21 + 21 = 105
Total workload: W+ T= Uopt= 75+ 105 = 180 hours per semester	

Course aims and learning outcomes	By mastering this course the student will be able to / will be able to: 1. Plan, install, uses and maintain wireless sensor networks, 2. Apply different network protocols in practice, 3. Apply the acquired knowledge in practice, 4. Identifies, formulates and solves problems of practical importance.
Prerequisites	None
Teaching methods	Lectures and laboratory exercises
Course content	1. Definitions of basic concepts of complex sensor networks. 2. Review of the structure of complex sensor networks, 3. Basic properties of complex sensor networks 4. Review of IEEE 1451 standards for smart converter networking 5. Overview of network communication model 6. Protocol for communication and synchronization 7. Classes of electrical interfaces with examples of implementations **8. Midterm test** 9. Overview of existing industrial wired interfaces., 10. Network topologies, interface specifications and communication protocols 11. Examples of industrial interfaces 12. Wireless dedicated sensor networks, hub architecture, 13. Overview of standard wireless interfaces, routing protocols for wireless sensor networks 14. Problems of data transmission protection and reduction of sensor node consumption **15. End-of-term test**

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Haenselmann, T.	Wireless Sensor Networks: Design Principles for Scattered Systems. Oldenbourg Verlag.	2011	
López, J., & Zhou, J. (Eds.).	Wireless sensor network security (Vol. 1). Ios Press.	2008	
Anjum, F., & Mouchtaris, P.	Security for wireless ad hoc networks. John Wiley & Sons.	2007	

	Assessment methods	**Points**	**Percentage**
Evaluation criteria	Pre-exam obligations attendance - lectures	10	10
	laboratory exercises	10	10%
	Midterm test	**20**	**20%**
	End-of term test	**20**	**20%**
	Final exam		
	Written exam	40	40%
	TOTAL	100	100%

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
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	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study programme: Traffic*** ***Profile: Informatics in traffic*** II cycle | I year of study	

Course title	**PARALLEL COMPUTING SYSTEMS**
Department	Computer and information sciences and bioinformatics, Faculty of Electrical Engineering East Sarajevo

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SI03225026,0311	elective	II	6,0

Professor/s	PhD Goran Kuzmić, Assistant Professor
Associate/s	PhD Goran Kuzmić, Assistant Professor

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient So**
L	**TE**	**LE**	**L**	**TE**	**LE**	**So**
3	1	1	63	21	21	1,4

Total teacher workload (hours, per semester) W = 3*15 + 1*15 + 1*15 = 45 + 15 + 15 = 75	Total student workload (hours, per semester) T = 3*15*1,4 + 1*15*1,4 + 1*15*1,4 = 63 + 21 + 21 = 105

Total workload: W+T=Uopt= 75+ 105 = 180 = hours per semester

Course aims and learning outcomes	After successfully mastering the content of the course, the student will be able to: -applies fast Fourier transform with the use of parallelism, -solves the problem of N bodies with the use of parallelism, -conducts Monte Carlo analysis using parallelism
Prerequisites	There are no prior prerequisites
Teaching methods	Lectures, auditory exercises, laboratory exercises, consultations
Course content by weeks	1 Hardware for parallel processing 2 Instruction-level parallelism 3 Parallelism at the shared memory level, parallelism at distributed memory 4 Typologies of communication networks and their impact on performances 5 Software protocols for parallel processing 6 Message Forwarding Protocol (MPI) protocol: Basics, 1-N, N-1 and N-M communication. 7 Parallel Virtual Machine (PVM) 8. Midterm test 9. Examples of parallelization of numerical algorithms 10. Algorithms in linear algebra using parallelisms 11. Fast Fourier transform using parallelisms 12. The problem of N bodies with the use of parallelisms 13 Monte 13. Carlo analysis using parallelisms 14 Efficiency of parallel computing 15 End-of-term test

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
M. Dubois, M. Annavaram, P. Stenström	Parallel Computer Organization and Design, Cambridge University Press	2012	
A. F. Lorenzon, A.C.S. B. Filho	Parallel computing hits the power wall: principles, challenges, and a survey of solutions. Springer Nature.	2019	

Evaluation criteria	**Assessment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	attendance - lectures/exercises	5	5%
	positively evaluated seminar paper	15	15%
	Midterm test	15	15%
	End-of term test	15	15%
	Laboratory exercises	10	10%
	Final exam		
	oral exam	40	40%
	TOTAL	100	100%

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
Applicable from	19.10.2023 - 213th session of the Academic Council, Faculty of Transport and Traffic Engineering Doboj

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj ***Study programme: Traffic*** ***Profile: Motor Vehicles*** I cycle | I year of study	

Course title	**UNCONVENTIONAL VEHICLE DRIVES**
Department	Motor Vehicles, Operation, Maintenance and Diagnostics of Vehicles

Code	**Course status**	**Semester**	**ECTS credits**
SAF12SM03226426,0320			

Professor/s	PhD Snežana Petković, Full Professor
Associate/s	PhD Snežana Petković, Full Professor

Weekly hours			**Individual student hours (per semester)**			**Student workload coefficient S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
3	2	0	3*15*1,4=63	2*15*1,4=42	0*15*1,4=0	1,4

Total teacher workload (hours, per semester) 3*15 + 2*15 + 0*15 = 75 hours	Total student workload (hours, per semester) 3*15*1,4 + 2*15*1,4 + 0*15*1,4 = 105 hours
Total subject load (teaching + student): 75 + 105 = 180 hours per semester	

Course aims and learning outcomes	1. introduction to the history of unconventional motor vehicle drives, reasons for development, possible implementations and the importance of these solutions 2. mastering the knowledge of the principles of operation of unconventional drives and theconcepts of vehicles with these drives 3. mastering the knowledge on the construction and development of components of unconventional motor vehicle drives 4. apply the acquired knowledge in practice
Prerequisites	does not have
Teaching methods	Lectures, auditory exercises, consultations
Course content	1. Review of performances of unconventional motor vehicle drives, history of development and assessment of their future significance. 2. Comparison of different unconventional drives from the point of view of application invehicles and their comparison with conventional drives. 3. Wankel engine. 4. Electric vehicle propulsion - concepts and designs. 5. Vehicle electric drive components - electric motors and rectifiers. 6. Components of electric drives of vehicles - energy storage and its provision. 7. Midterm test 8. Fuel cells - working principle and vehicle concepts. 9. Fuel cells - hydrogen storage and necessary infrastructure. 10. Hybrid drives - concepts, advantages and perspectives. 11. Hybrid drive components. 12. Stirling engine as a propulsion engine - theoretical foundations. 13. Gas turbine as propulsion engine. 14. Flywheel as propulsion engine. 15. Solar drive. (End-of-term test)

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Mitschke M., Wallentowitz H.:	Dynamics of power vehicles. Springer Verlag,Berlin	2004.	
Bauer H.:	Motor vehicle manual Bosch, Springer Verlag,Berlin	1998.	
Braess H.H., Seiffert U.:	Vieweg handbook for motor vehicle technology, Vieweg Verlag, Braunschweig	2001.	

	Assessment methods	**Points**	**Percentage**
Evaluation criteria	Pre-exam obligations		
	attendance	10	10%
	Midterm test	30	30%
	End-of.term test	30	30%
	Students who pass all tests are exempted from the written part of the examination.		
	Final exam		
	final exam (oral)	30	30%
	TOTAL	100	100%

Web sources	http://sf.ues.rs.ba/eng/wp-content/uploads/2024/01/Engleski-NPP-II-ciklus.pdf
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