UNIVERSITY OF EAST SARAJEVO
FACULTY OF TRANSPORT AND TRAFFIC ENGINEERING
DOBOJ

II CYCLE OF STUDY
STUDY PROGRAMME
TRANSPORT AND TRAFFIC

Doboj, 2016

CURRICULUM

SECOND CYCLE OF STUDY
(MASTER ACADEMIC STUDIES)

- TRANSPORT AND TRAFFIC-

The road transport and traffic

UNIVERSITY OF EAST SARAJEVO

II CYCLE TRAFFIC
(The road transport and traffic)

I year of study									
Number	**Code**	**Course title**	**Course status**	**Conditionality**	**Semester**	**Hours per semester**			**ECTS**
						L	TE	LE	
1.	САФ12СД02118016,0320	Methodology of scientific research work	O		I	3	2	0	6
2.	САФ12СД02118116,0320	Models, simulations and animations in traffic	O		I	3	1	1	6
3.	САФ12СД02118216,0320	Technical diagnostics of motor vehicles	O		I	3	2	0	6
4.	САФ12СД02218316,0320	1. Traffic networks	I_1		I	3	2	0	6
	САФ12СД02218416,0320	2. Deterministic models of operational research							
	САФ12СД02218516,0320	3. Telematic systems in road traffic							
5.	САФ12СД02218616,0320	1. Passenger transport systems	I_2		I	3	1	1	6
	САФ12СД02218716,0320	2. Goods transport systems							
	САФ12СД02218816,0320	3. Terminals and parking							
6.	САФ12СД02218926,0320	1. Forecasts in traffic	I_3		II	3	2	0	6
	САФ12СД02219026,0320	2. Traffic regulation and management							
	САФ12СД02219126,0320	3. Traffic Design - engineering of street systems							
7.	САФ12СД02219226,0320	1. Vehicle fleet maintenance system designing	I_4		II	3	1	1	6
	САФ12СД02219326,0320	2. Expertise of traffic accidents							
	САФ12СД02214726,0320	3. Database							
8.	САФ12СД021194218,01600	Master paper	O		II	16	0	0	18
					TOTAL:	**37**	**11**	**3**	**60**

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering ***Study program: Traffic*** ***Profile: The road transport and traffic*** II cycle | I year of study	

Course title	**METHODOLOGY OF SCIENTIFIC RESEARCH WORK**
Department	Department of Transport Engineering, Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СД02118016,0320	obligatory	I	6

Professor/s	PhD Perica Gojković, Full Professor; PhD Zoran Ćurguz, Associate Professor
Associate/s	Bojana Ristić, 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	$X*15*S_o$	$Y*15*S_o$	$Z*15*S_o$	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	1. Introducing students with methods used in the preparation of scientific research papers 2. Introducing students to the techniques used in the preparation of scientific research papers 3. mastering the writing and defense of the thesis 4. independent preparation of seminar paper
Prerequisites	no
Teaching methods	Lectures, auditory exercises, consultations
Course content	1. The concept, subject, significance and historical development of the methodology of scientific research 2. Basic scientific theories and research 3. Methods of scientific research 4. Conceptual foundations of research (concepts, theories and models, formulation and explanation of research topics and problems, defining the subject and goal of research, formulating research hypotheses) 5. Research approaches, strategies and planning (selection of research methods, determination of population and research sample) 6. Theoretical review of research (review of literature and research in accordance with the concept of research), first colloquium 7. Operationalization of research (measurement of economic variables, typology of data, search of primary and secondary sources, arranging and analyzing data, testing hypotheses) 8. Research instruments; notion of instruments, types of instruments, competition of instruments 9. Sample; concept, types, procedures and sampling techniques 10. Project of scientific research work 11. Methodology and technology of making a scientific work 12. Discussion of results 13. Writing a research report and conclusions 14. Preparation of bibliographic papers, technical processing of a scientific work, second colloquium

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
1. Zakic M.:	Methodology of scientific research, Faculty of Law, Banja Luka	2000.	
2. Colakhodzic E.:	Methodology and technology of scientific research work, Faculty of Teacher Education, Džemal Bijedić University, Mostar	2021.	

Additional readings

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

1. Stanivukovic D.:	Method of scientific work, Faculty of Technical Sciences, Novi Sad		

	Assesment methods	Points	Percentage
Evaluation criteria	Pre-exam obligations		
	attendance at lectures / exercises	5	5 %
	teaching activity	5	5 %
	positively graded seminar paper	20	20 %
	colloquium	40	40 %
	Final exam		
	Oral exam	30	30 %
	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 in Doboj		

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering ***Study program: Traffic*** ***Profile: The road transport and 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**
САФ12СД02118116,0320	Obligatory	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. optimizes traffic processes 2. models traffic processes 3. simulates traffic processes 4. animates traffic processes
Prerequisites	Does not have
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

	Assesment methods	Points	Percentage
Evaluation criteria	Pre-exam obligations		
	attendance at lectures / exercises	10	10%
	positively assessed seminary work / project / essay	10	20%
	case study - group work	10	10%
	test / colloquium	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		
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 program: Traffic*** ***Profile: The road transport and traffic*** II cycle | I year of study	

Course title	**TECHNICAL DIAGNOSTICS OF MOTOR VEHICLES**
Department	Department for motor vehicles, exploitation, maintenance and diagnostics of vehicles – Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СД02118216,0320	compulsory	I	6.0

Professor/s	PhD Zdravko B. Nunić, Full Professor
Associate/s	PhD Zdravko B. Nunić, 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	67.5	45	0	1.5

Total teacher workload (hours, per semester) 3*15 + 2*15 + 0*15 = W 45 + 30 + 0 = 75 hours	Total student workload (hours, per semester) 3*15*1.5 + 2*15*1.5 + 0*15*1.5 = T 67.5 + 45 + 0 = 112.5 hours
Total workload: $W+T=U_{opt}$= 75 + 112.5 = 187.5 hours per semester	

Course aims and learning outcomes	After successfully completing this course, a student will be able to: 1. recognize different basic systems of motor vehicles, 2. determine necessary stages of controlled system diagnostics on a vehicle, 3. define stages of diagnostics, 4. define appropriate measuring instruments for controlling the selected system, 5. evaluate the parameters of the failure of system elements and propose necessary corrective actions for its elimination
Prerequisites	Scientific research work exam passed
Teaching methods	Lectures, theoretical exercises, seminar paper
Course content	1. Elements of diagnostics of motor vehicles and engines 2. Methods of diagnostics of motor vehicles and engines 3. Procedures of diagnostics of motor vehicles and engines 4. Diagnostic parameters of motor vehicles and engines – testing 5. Diagnostics of traction and speed characteristics – practical 6. Diagnostics of control and braking system – practical 7. **Colloquium I** 8. Diagnostics of motion system and suspension system – practical 9. Diagnostics of transmission system – practical 10. Diagnostics of exhaust system 11. Diagnostics of comfort system in a vehicle 12. Diagnostics of chassis elements - safety elements 13. Diagnostics of elements of catalytic safety 14. Errors that may occur during technical condition determination 15. **Colloquium II**

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Todorović, P., Jeremić, B., Mačužić, I.	Tehnička dijagnostika, Univerzitet u Kragujevcu, Mašinski fakultet	2009	1-202

Additional readings

Author/s	**Name of publication, editor**	**Year**	**Pages (from-to)**
Adamović, Ž.	Tehnička dijagnostika; Zavod za udžbenike i nastavna sredstva, Beograd	1998	1-447
Janićijević, N.	Automatsko upravljanje u motornim vozilima, Mašinski fakultet Beograd	1993	1-190

	Assessment methods	**Points**	**Percentage**

Evaluation criteria	Pre-exam obligations		
	e.g. attendance to lectures / exercises	10	10%
	e.g. seminar paper/ project/ essay positively assessed	20	20%
	e.g. case study – group work	/	/
	e.g. test / colloquium	70	70%
	e.g. laboratory work / laboratory exercises	/	/
	e.g. practical work	/	/
	Final exam		
	e.g. final exam (oral / written)	30+40	70%
	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 program: Traffic*** ***Profile: The 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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СД02218316,0320	election	I	6

Professor/s	PhD Marko Subotić, Associate Professor
Associate/s	Bojana Ristić, 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 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. They apply 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	**Assesment methods**	**Points**	**Percentage**
	Pre-examination obligations		
	attendance	5	5 %
	activity during classes	5	5 %
	Semestral work	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 program: Traffic*** ***Profile: The road transport and traffic*** II cycle | I year of study	

Course title	**DETERMINISTIC MODELS OF OPERATIONAL RESEARCH**
Department	

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СД02218416,0320			

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**
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	
Prerequisites	
Teaching methods	
Course content	

Textbook (s)

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

Additional readings

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

	Assesment methods	**Points**	**Percentage**
Evaluation criteria			

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 program: Traffic*** ***Profile: The road transport and traffic*** II cycle | I year of study	

Course title	**TELEMATIC SYSTEMS IN ROAD TRAFFIC**
Department	Department for Transport Engineering – Faculty of Transport and Traffic Engineering

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СД02218516,0320	election	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 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	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 practice
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 PhDумском саобраћају-основе, CD	2012.	-

Additional readings

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

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Pre-examination obligations		
	attendance	20	20%

	activity during classes	20	20%
	term paper	20	20%
	colloquium I	10	20%
	colloquium II	10	10%
	Students who pass all colloquia are exempted from the written part of the examination.		
	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 in Doboj		

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering ***Study program: Traffic*** ***Profile: The road transport and traffic*** II cycle | I year of study	

Course title	**PASSENGER TRANSPORT SYSTEMS**
Department	Department of Road Traffic and Transport - Faculty of Transportation Doboj

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СД02218616,0320	elective	I	6,00

Professor/s	PhD Bojan Marić, Associate Professor
Associate/s	Radenka Đekić, Senior Assistant

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	1. knowledge of concepts and definitions of transport systems and transport policy 2. mastering scientific and professional knowledge, methods and information on the management of complex systems of urban and road passenger transport 3. mastering the models of organization and management of passenger transport systems and access to the transport services market 4. independent work on timetable calculations
Prerequisites	Passed the exam in the subject Transport of passengers and goods, Academic study of the first cycle
Teaching methods	Lectures, interactive workshops, case studies, debates, team presentations, etc.
Course content	1. Concepts and definitions of transport systems 2. Content and concepts of transport policy 3. Basic regulations and institutions in the field of road transport 4. Cities and public urban passenger transport systems (JGTP). Problems of modern cities 5. Fundamentals of modern transport policy 6. Subsystems of public passenger transport 7. Comparative analysis of subsystem performance 8. Organization and management of road transport systems - basic concepts 9. Models of organization and management of passenger transport systems 10. Models of access to the transport services market 11. Physical, functional and logical system integration 12. System quality and service quality. Forms and properties of service quality 13. Service quality indicators 14. Research methods in the passenger transport system 15. IT technologies in the passenger transport system

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Slaven Tica	Public passenger transport systems - Elements of technology, organization and management, University of Belgrade - Faculty of Transport and Traffic Engineering, Belgrade	2016.	-
Slaven Tica	Written material and presentations from lectures and exercises, Faculty of Transportation, Doboj	2015.	-
Vukan Vuchic	Urban Transit: System and Technology, John Viley&Sons Inc., Hoboken, New Jersey	2007.	-
Vukan Vuchic	Urban Transit Operation, Planning and Economics, John Viley&Sons Inc, Hoboken, New Jersey, USA	2005.	-

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Pre-exam obligations		

	attendance at lectures / exercises	5	5%
	activity during classes	5	5%
	I am positively assessed. work	20	20%
	colloquia	30	30%
	Students who pass all the colloquia are exempted from the written part of the exam.		
	Final exam		
	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		
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 program: Traffic*** ***Profile: The road transport and traffic*** II cycle | I year of study	

Course title	**GOODS TRANSPORT SYSTEMS**
Department	Department of Road Traffic and Transport - Faculty of Transportation Doboj

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СД02218716,0320	elective	I	6,00

Professor/s	PhD Bojan Marić, Associate Professor
Associate/s	Radenka Đekić, Senior Assistant

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	1. knowledge of concepts and definitions of transport systems and transport policy 2. mastering scientific and professional knowledge, methods and information on the management of complex systems of urban and road transport of goods 3. reading, understanding and using legal regulations and standards 4. mastering information systems and management systems in road transport
Prerequisites	Passed the exam in the subject Transport of passengers and goods, Academic study of the first cycle
Teaching methods	Lectures, interactive workshops, case studies, debates, team presentations, etc.
Course content	1. Concepts and definitions of transport systems 2. Content and concepts of transport policy 3. Basic regulations and institutions in the field of road transport 4. Freight road transport market 5. International and national road transport of goods (DTR) 6. Transportation for own needs. Groupage 7. Transport of goods in cities 8. Organization and management of road transport systems - basic concepts 9. Specific types of services in DTR. Oversized transport 10. Transport of dangerous goods 11. Transport of perishable goods. Transport of live animals 12. System quality and service quality. Forms and properties of service quality 13. Service quality indicators in DRT. Research methods 14. Information system in road transport 15. Management systems in road transport

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Olivera Medar, Slaven Tica	Written material and presentations from lectures and exercises, Faculty of Transportation, Doboj	2010.	-
I. Ivanovic	Modeling of transport capacities of freight transport, Faculty of Transportation, Belgrade	2005.	-
S. Cole	Applied Transport Economic : Policy, Management and Decision Making, Kogan Page, London, UK	2005.	-
Vukan Vuchic	Urban Transit Operation, Planning and Economics, John Viley&Sons Inc, Hoboken, New Jersey, USA	2005.	-

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	attendance at lectures / exercises	5	5%
	activity during classes	5	5%

	I am positively assessed. work	10	10%
	colloquia	40	40%
	Students who pass all the colloquia are exempted from the written part of the exam.		
	Final exam		
	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		
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 program: Traffic*** ***Profile: The road transport and traffic*** II cycle | I year of study	

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СД02218816,0320	elective	I	6,00

Professor/s	PhD Bojan Marić, Associate Professor
Associate/s	Radenka Đekić, Senior Assistant

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 work, 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
Svetozar Kostic, Branko Davidovic, Zoran Papic	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

	Assesment methods	Points	Percentage
Evaluation criteria	Pre-exam obligations		
	for example. attendance at lectures / exercises	10	10%
	for example. I am positively assessed. paper / project / essay	20	20%
	for example. case study - group work	/	/
	for example. test / colloquium	70	70%
	for example. laboratory work / lab. exercises	/	/
	for example. practical work	/	/
	Final exam		
	for example. 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 in Doboj		

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering ***Study program: Traffic*** ***Profile: The road transport and traffic*** II cycle | I year of study	

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СД02218926,0320		II	6

Professor/s	PhD Valentina Mirović, Full Professor
Associate/s	PhD Valentina Mirović, 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*S_o	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: 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 socio-economic 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 assignmentseminar 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,	2006	

	U.S. Department of Transportation		
Banister, D.	Transport Planning, Spon Press, New York	2002	

	Assesment methods	Points	Percentage
Evaluation criteria	Pre-exam assignments		
	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		
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 program: Traffic*** ***Profile: The road transport and traffic*** II cycle | I year of study	

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СД02219026,0320	election	II	6,0

Professor/s	PhD Marko Subotić, Associate Professor
Associate/s	Bojana Ristić, 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 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.	-

Additional readings

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

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Pre-examination obligations		
	attendance	5	5 %
	activity during classes	5	5 %
	Tests	10	10 %
	Seminary 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 in Doboj		

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering ***Study program: Traffic*** ***Profile: The 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**
САФ12СД02219126,0320	election	II	6,0

Professor/s	PhD Marko Subotić, Associate Professor
Associate/s	Bojana Ristić, 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 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 PhDуштво за путеве	Часопис Пут и саобраћај	2011.	-
EUROFILE	Часопис WORD HIGHWAUS	2011.	-

	Assesment 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 in Doboj		

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering ***Study program: Traffic*** ***Profile: The road transport and traffic*** II cycle | I year of study	

Course title	**VEHICLE FLEET MAINTENANCE SYSTEM DESIGNING**
Department	Department of Road Transport and Traffic- Faculty of Transport and Traffic Engineering

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СД02219226,0320	election	II	6

Professor/s	PhD Mesud Ajanović, Full Professor
Associate/s	PhD Mesud Ajanović, 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= 15 hours
Total workload: $W+T=U_{opt}$= 75 + 105 = 180 hours per semester	

Course aims and learning outcomes	1. knowledge of terms and definitions of fleets 2. to acquaint the student with the design of various fleet maintenance systems 3. to get acquainted with basic knowledge in the field of maintenance system analysis 4. apply the acquired knowledge in practice
Prerequisites	None
Teaching methods	Lectures, exercises, laboratory work, interactive workshops, debates, presentations, public defense of term paper
Course content	1. Division of vehicle fleets. Characteristics of fleets 2. Fleet resource management 3. Selection, procurement and write-off of vehicles 4. Methods of financing the purchase of vehicles 5. Analysis of financial reports of the fleet 6. Models of organization and management of vehicle fleets 7. Fleet activities. subcontracting fleet activities 8. Fleet cost management 9. Cost planning. Cost control. Management of information on the work and costs of the vehicle fleet, selection of information system and application 10. Professional training of employees in fleets. Risk management and fleet insurance 11. Design of fleet maintenance systems 12. Quantification of the impact of maintenance system quality parameters 13. Integral dynamic-stochastic simulation model for quantifying the influence of quality parameters 14. Models of calculating the periodicity of preventive interventions 15. Self-maintenance system and vehicle maintenance system for third parties, i.e. production system

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Папић В.Д.:	Управљање оPhDжавањем возних паркова, уџбеник у припреми		-
Payant R.P., Lewis B.T.:	Facility Manager's Maintenance Handbook, Secon d Edition, McGraw-Hill, New York	2007.	-

Additional readings

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

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Pre-examination obligations		
	attendance	5	5%
	activity during classes	5	5%

	term paper	30	30%
	colloquium I	15	15%
	colloquium II	15	15%
	Students who pass all colloquia 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		
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 program: Traffic*** ***Profile: The road transport and traffic*** II cycle of study | I years of study	

Course title	**EXPERTISE OF TRAFFIC ACCIDENTS**
Department	Department of Transportation Engineering

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СД02219326,0320	Electoral	II	6,0

Professor/s	PhD Tihomir Đurić, Full Professor
Associate/s	PhD Tihomir Đurić, 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*0,2=9	1*15*0,2=3	1*15*0.2=3	0,2

Total teacher workload (hours, per semester) 3*15 + 1*15 + 1*15 =75 hours	Total student workload (hours, per semester) 3*15*0.2 + 1*15*0.2+ 1*15*0.2= 15 hours

Total workload: $W+T=U_{opt}$= **75 + 15 = 90** hours per semester

Course aims and learning outcomes	By mastering this course the student will be able to: 1. Understands the concept and importance of traffic accident expertise 2. correctly interprets the traffic accident traces 3. the application of the scientific method in the process of traffic accident analysis 4.for simpler traffic accident analysis
Prerequisites	student may take the exam if he or she has passed the traffic safety exam
Teaching methods	ex-chair lectures, workshops, discussions, focus groups, individual and group work
Course content	1. Introduction, subject and method of study. 2. Legal basis of expert evaluation, place and role of traffic and technical expertise in judicial process 3. Methodology of traffic-technical analysis of traffic accidents 4. Ways to express the views of experts 5. Content of expert findings and opinions: Background 6. Classification of traffic accident traces 7. Contents of the expert's findings and opinions: Expert's finding - analysis of injuries and damage to the vehicle 8. Content of expert findings and opinions: Expert Findings - analysis of vehicle traces 9. Content of expert findings and opinions: Expert finding - lamp trace analysis 10. Calculation of vehicle speeds involved in a traffic accident 11. Determining the location of the collision 12. Defining a traffic accident omission 13. Use of computers and specialized software in traffic accident expertise 14. Specificity of expertise of particular traffic accidents 15. Specificity of expertise of particular traffic accidents

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
1. Dragac R.	Road Traffic Accident Investigation and Expertise, (J.P. SRJ Official Gazette), Belgrade	2007.	1-560
2. Dragac R. i Vujanic M.	Traffic Safety Part II, Faculty of Transportation, Belgrade	2002.	79-220
3. Vujanic M., Antic B., Pesic D. i Lipovac K.	Collection of tasks in traffic safety, with practicum, Faculty of Transport and Traffic Engineering, Belgrade	2015.	1-240

Additional readings

Author/s	**Name of publication, editor**	**Year**	**Pages (from-to)**
1. Lipovac K.	Traffic Accident Inspection - Elements of Traffic Tracology, College of Internal Affairs, Belgrade	2000.	1-208

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	activity during class - tests	10	10
	colloquiums	15	15
	positively evaluated seminar paper	20	20
	Final exam		
	written part of the exam	35	35
	final exam - oral	20	20
	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 in Doboj		

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering ***Study program: Traffic*** ***Profile: The road transport and traffic*** II cycle | I year of study	

Course title	**DATABASE**
Department	Department of Transportation Engineering - Faculty of Transportation Doboj

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СД02214726,0320	Electoral	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	3*15*0,2=9	1*15*0,2=3	1*15*0.2=3	0,2

Total teacher workload (hours, per semester) 3*15 + 1*15 + 1*15 =75 hours	Total student workload (hours, per semester) 3*15*0.2 + 1*15*0.2+ 1*15*0.2= 15 hours

Total workload: $W+T=U_{opt}$= **75 + 15 = 90** hours per semester

Course aims and learning outcomes	1. Students will be able to create and implement a database in traffic 2. Students will be released to manage traffic databases 3. Students will use the database management tool to create a user interface in traffic. 4. Professional knowledge of students will be received through the application of various minor applications in transport companies
Prerequisites	There are no formal conditions
Teaching methods	Lectures, laboratory exercises, computer classroom exercises and consultations. Learning and independent development of practical tasks.
Course content	1. The notion of data model - the notion of entity, type and class of entity, feature, entity type key 2. Concepts of database schemes at the intensive and extensional level. 3. Generations of data models applied in traffic 4. Model objects - connections. Intensity and extension of the model. IDEF1X standard for data modeling. 5. Application of relational data model in traffic - Concepts of structural component of the model. Integrity component. 6. Types of dependencies in the relational database scheme in traffic. 7. Algorithms for designing relational database schemes in traffic. 8. I colloquium 9. The notion of data normalization and normal form. Relational data model - Concepts of the operational component of the model. 10. Relational algebra and relational calculus Standard SQL query language. Inquiries 11. Update the database. Views. Restrictions. Object data model - Type specification. Inheriting states and behaviors. 12. Class diagrams. OQL object query language. XML as a data model - Defining types of XML documents. 13. Introduction to the concept of the base of mobile objects for tracking the routes of traffic entities. 14. Display of GPS tracks of different types of vehicles on a digital map. 15. II colloquium

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Lazarević B., Marjanović Z., Aničić N., Babarogić S.	Database	2003	
Mogin P., Lukovic I.	Principles of databases	1995	

Additional readings			
Author/s	**Name of publication, editor**	**Year**	**Pages (from-to)**
Elmasri R., Navathe S. B.	„Fundamentals of Database Systems“5th Edition,	2006	

	Assesment methods	**Points**	**Percentage**
Evaluation criteria	Pre-exam obligations		
	attendance at lectures / exercises	5	5%
	I am positively assessed. paper / project / essay	15	15%
	case study - group work		
	test / colloquium	40	40%
	laboratory work / lab. exercises		
	practical work		
	Final exam		
	for example. final exam (oral / written)	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 in Doboj		

RAILWAY TRAFFIC

UNIVERSITY OF EAST SARAJEVO
Faculty of Transport and Traffic Engineering Doboj

II CYCLE TRAFFIC
(Railway traffic)

I year of study									
Number	**Code**	**Course title**	**Course status**	**Conditionality**	**Semester**	**Hours per semester**			**ECTS**
						L	**TE**	**LE**	
1.	САФ12СЖ02118016,0320	Methodology of scientific research work	M		I	3	2	0	6
2.	САФ12СЖ02118116,0320	Models, simulations and animations in traffic	M		I	3	1	1	6
3.	САФ12СЖ02119516,0320	High-speed train systems	M		I	3	2	0	6
4.	САФ12СЖ02219616,0320	1. Selected chapters from the tehnology for the exploitation of railway traffic	O_1		I	3	1	1	6
	САФ12СЖ02219716,0320	2. Work theory of railway network operator and towing organization							
	САФ12СЖ02219816,0320	3. Planning and design of railway lines							
5.	САФ12СЖ02219916,0320	1. Selected chapters from the transport of passengers by rail	O_2		I	3	1	1	6
	САФ12СЖ02220016,0320	2. Quality and service system in railway traffic							
	САФ12СЖ02220116,0320	3. Selected chapters from the transport of goods by rail							
6.	САФ12СЖ02220226,0320	1. Automation of railway traffic through information technologies	O_3		II	3	1	1	6
	САФ12СЖ02220326,0320	2. Strategic management in railway engineering							
	САФ12СЖ02219326,0320	3. Expertise of traffic accidents							
7.	САФ12СЖ02218426,0320	1. Deterministic models of operational research	O_4		II	3	1	1	6
	САФ12СЖ02220426,0320	2. Risk analysis							
	САФ12СЖ02220526,0320	3. Modeling in railway transport							
8.	САФ12СЖ021194218,01600	MASTER THESIS	O		II	16	0	0	18
					TOTAL	**37**	**9**	**5**	**60**

Profile: *Master of traffic - 300 ECTS - railway traffic*

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

Course title	**METHODOLOGY OF SCIENTIFIC RESEARCH WORK**
Department	Department of Transport Engineering - Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СЖ02118016,0320	mandatory	I	6.00

Professor/s	PhD Perica Gojković, Full Professor; PhD Zoran Ćurguz, Associate Professor
Associate/s	Bojana Ristić, 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	X*15*S_o	Y*15*S_o	Z*15*S_o	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	1. Introducing students with methods used in the preparation of scientific research papers 2. Introducing students to the techniques used in the preparation of scientific research papers 3. mastering the writing and defense of the thesis 4. independent preparation of seminar paper
Prerequisites	no
Teaching methods	Lectures, auditory exercises, consultations
Course content	1. The concept, subject, significance and historical development of the methodology of scientific research 2. Basic scientific theories and research 3. Methods of scientific research 4. Conceptual foundations of research (concepts, theories and models, formulation and explanation of research topics and problems, defining the subject and goal of research, formulating research hypotheses) 5. Research approaches, strategies and planning (selection of research methods, determination of population and research sample) 6. Theoretical review of research (review of literature and research in accordance with the concept of research), first colloquium 7. Operationalization of research (measurement of economic variables, typology of data, search of primary and secondary sources, arranging and analyzing data, testing hypotheses) 8. Research instruments; notion of instruments, types of instruments, competition of instruments 9. Sample; concept, types, procedures and sampling techniques 10. Project of scientific research work 11. Methodology and technology of making a scientific work 12. Discussion of results 13. Writing a research report and conclusions 14. Preparation of bibliographic papers, technical processing of a scientific work, second colloquium

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Zakic M.:	Methodology of scientific research, Faculty of Law, Banja Luka	2000.	
Colakhodzic E.:	Methodology and technology of scientific research work, Faculty of Teacher Education, Džemal Bijedić University, Mostar	2021.	

Additional readings

Author/s	**Name of publication, editor**	**Year**	**Pages (from-to)**
Stanivukovic D.:	Method of scientific work, Faculty of Technical Sciences, Novi Sad		

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**

	Pre-exam obligations		
	attendance at lectures / exercises	5	5%
	teaching activity	5	5%
	positively graded seminar paper	20	20%
	colloquium	40	40%
	Final exam		
	Oral exam	30	30%
	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 in Doboj		

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering ***Study program: Traffic*** ***Profile: Railway 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**
САФ12СЖ02118116,0320	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. optimizes traffic processes 2. models traffic processes 3. simulates traffic processes 4. animates traffic processes
Prerequisites	Does not have
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	**Assesment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	attendance at lectures / exercises	10	10%
	positively assessed seminary work / project / essay	10	20%

	case study - group work	10	10%
	test / colloquium	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		
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 Doboj ***Study program: Traffic*** ***Profile: Railway traffic*** II cycle | I year of study	

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СЖ02119516,0320	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 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 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 high-speed trains, 2. analyze their technical and aerodynamic characteristics 3. independently work on the construction of high-speed trains, as well as performance calculations, kinematics and dynamics, 4. simulating high-speed train movements as well as self-guiding curtain sets
Prerequisites	None
Teaching methods	Lectures, auditory exercises, consultations.
Course content	1. Basic requirements and basic performance of high-speed train sets and track design 2. Technical and aerodynamic characteristics of diesel-engine sets of high-speed trains, electro-motor sets and sets with self-loading box 3. Basic characteristics of magnetically-levitation set 4. Computer systems 5. Signaling systems 6. Telecommunication systems 7. Security systems for the safety of the route 8. Types and characteristics of traction engines 9. Linear engines 10. Numerical analysis and simulation of high speed gear sets 11. Determination and baseline calculation of basic aerodynamic effects during the movement of high-speed trains 12. Calculation of kinematic and dynamic performances 13. Simulation of self-assembly of sets in the curve 14. Dimensioning of stable electric power train units of high-speed trains and traction electric motors 15. 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	--

Additional readings

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

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	Presence during lectures	10	10%
	Positively evaluated seminary work	20	20%
	Project presentation	20	20%
	Exam/colloquium	20	20%

	Labaratory work-practice		
	Practical work		
	Final exam		
	wrriten	15	15%
	verbally	15	15%
	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 in Doboj		

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

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СЖ02219616,0320	optional 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 S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
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: $W+T=U_{opt}$ = 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	--

Additional readings

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

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Preexamination obligations		
	Presence during lectures	5	5%
	Seminary work	25	25%
	Colloquium I and II	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 in Doboj		

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

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СЖ02219716,0320	optional 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 and Traffic Engineering, Belgrade*	2002	
Dinić D.	*Vuča Vozova, Zavod za novinsko-izdavačku i propagandnu delatnost JŽ, Beograd*	1983	
Kovačević P.	*Eksploatacija železnica knjiga I i II, Zavod za NIP delatnost JŽ, Beograd*	1988	

Additional readings

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

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	Presence during lectures	10	10%

	Positively evaluated seminary work	20	20%
	Project presentation	20	20%
	Exam/colloquium	20	20%
	Labaratory work-practice		
	Practical work		
	Final exam		
	wrriten	15	15%
	verbally	15	15%
	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 in Doboj		

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

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СЖ02219816,0320	optional 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 S_o**
L	**TE**	**LE**	**L**	**TE**	**LE**	**S_o**
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=U_{opt} = 75 + 105 = 180 hours per semester	

Course aims and learning outcomes	Compiting this course, the student will be enabled to: 1. to participates in the preparation of spatial plans, 2. to participates in the preparation of planning and design documents, 3. to participates in the evaluation of different railway line alignment s, 4. to 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 colloquiums passed, 4. all test 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 (**1st colloquium**) 7. Vertialc 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 (**2nd colloquium**)

Textbook (s)

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

Evaluation criteria	**Assesment 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		
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 Doboj ***Study program:*** **Traffic** ***Profile:*** **Railway traffic** II cycle | I year of study	

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СЖ02219916,0320	optional 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 / 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 Transport and 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)**

	Assesment methods	**Points**	**Percentage**
Evaluation criteria	Pre-exam obligations		
	Presence during lectures	10	10%
	Positively evaluated seminary work	3x10	30%
	Project presentation	30	30%
	Exam/colloquium		

	Labaratory work-practice		
	Practical work		
	Final exam		
	verbally	30	30%
	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 in Doboj		

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

Course title	**QUALITY AND SERVICE SYSTEM IN RAILWAY TRAFFIC**
Department	Department for Transport Engineering – Faculty of Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СЖ02220016,0320	optional 2	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**	**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. understands the requirements of railway service users in the context of the needs imposed by the modern market, 1. use and apply different approaches, models and methods of measuring and improving quality, 2. develop and apply specific quality management models in real business conditions, 3. measure and improve the quality of processes on the railway and railway system, 4. manages resources within its competence more successfully in real business conditions.
Prerequisites	None
Teaching methods	Lectures, auditory exercises, seminary work, consultations
Course content	1. Characteristics and specifics of the modern market of transport services 2. Defining the concept of transport service quality 3. Quality global vision of the future 4. The place and role of the quality system in the organization 5. Evolution of the concept of quality management 6. Quality management systems 7. I colloquium 8. Approach to the introduction of quality systems in the railway transport organization 9. Development of procedures. Building business processes. Flowchart 10. Process management through quality cost management 11. The concept of continuous quality improvement. Quality loop 12. Integrated quality management systems. Structure. Integration methods 13. Models of excellence. Quality management tools and techniques, 14. Development and application of specific models and approaches to quality management in the railway transport organization 15. II colloquium

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Bobrek, M., Milekić, M., Macanović, K.	Quality management (Integrated management system according to ISO 9001: 2015), *Faculty of Transport and Traffic Engineering Doboj*	2014	1-284

Additional readings

Author/s	**Name of publication, editor**	**Year**	**Pages (from-to)**
Kilibard, M., Zečević, S.	Quality management in logistics, Faculty of Transport and Traffic Engineering, Belgrade	2008	1-368

	Assesment methods	**Points**	**Percentage**
Evaluation criteria	Pre-exam obligations		
	Presence during lectures	10	10%
	Positively evaluated seminary work	20	20%

	Exam/colloquium	2x35	70%
	Final exam		
	wrriten		
	verbally		
	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 in Doboj		

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering Doboj	
	Study program: **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 Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СЖ02220116,0320	optional 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_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 students will be able to / 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	

Additional readings

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

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	Presence during lectures	10	10%
	Positively evaluated seminary work	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 in Doboj		

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

Course title	**AUTOMATION OF RAILWAY TRAFFIC THROUGH INFORMATION TECHNOLOGIES**
Department	Department for Transport Engineering – Faculty of Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СЖ02220226,0320	optional 3	II	6.00

Professor/s	PhD Ratko Đuričić, Full Professor
Associate/s	PhD Ratko Đuričić, Full 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. knows modern systems for railway traffic automation. 2. knows the application of information and communication technologies on the railway. 3. follows world trends in this field and is qualified to propose applications in our country and 4. has the knowledge to be able to get involved in their development.
Prerequisites	None
Teaching methods	Classes are conducted in the form of lectures by teachers, classroom exercises and demonstration exercises on our railway and, if possible, foreign railways. Learning, tests, assignments and consultations.
Course content	1. Introduction. Basic terms. 2. Traffic telecommand 3. Line setting 4. Automation of railway traffic 5. Automatic train guidance 6. ETCS 7. Automatic traffic management 8. ERTMS 9. Modern railway communication systems 10. GSM-R 11. Satellite tracking of locomotives and trains 12. Automation of shunting station operation 13. Directions of development of shunting station automation 14. Information technologies on railways 15. High speed trains

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Zoran Ž. Avramović	Modeling and Microcomputer Management of Shunting Stations (monograph), Želnid, Belgrade, Serbia	1995	full book

Additional readings

Author/s	**Name of publication, editor**	**Year**	**Pages (from-to)**
Zoran Ž. Avramović	Design of relay station signaling and safety devices, Faculty of Transport, Communications and Logistics, Berane, Montenegro	2015	full book

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	Presence during lectures	10	10%
	Positively evaluated seminary work	10	10%

	Project presentation		
	Exam/colloquium	2x25	50%
	Labaratory work-practice		
	Practical work		
	Final exam		
	Final exam(verbally)	30	30%
	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 in Doboj		

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

Course title	**STRATEGIC MANAGEMENT IN RAILWAY ENGINEERING**
Department	Department for Transport Engineering – Faculty of Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СЖ02220326,0320	optional 3	II	6.00

Professor/s	PhD Slobodan Subotić, Associate Professor
Associate/s	PhD Siniša Božičković, Assistant 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. govern the basics and essence of management; 2. create a vision, mission and goals in identifying competitiveness; 3. performs performance measurement; 4. conducts electronic business.
Prerequisites	None
Teaching methods	Lectures, auditory and calculation exercises, consultations
Course content	1. The concept and essence of management. Fundamentals of the strategic management process. Schools of strategic management 2. Approaches to strategic thinking. Modern business environment 3. The concept and analysis of the business environment of the company. 4. Vision, mission, goals. Identifying competitiveness .. 5. Value chain analysis. Prediction 6. Formulation of strategy 7. Implementation of the strategy. Strategic control. 8. Performance measurement 9. Portfolio analysis. SWOT analysis. Scenario method 10. Experience curve technique. Gap analysis 11. Product life cycle concept. Benchmarking. 12. Strategic importance of information technology in business 13. Electronic business 14. The concept of learning organization 15. Business process reengineering

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Vešović, V.	Traffic Management, Fifth Supplemented Edition, Faculty of Transport and Traffic Engineering, University of Belgrade	2003	
Todorović, J., Đuričin, D., Janošević, S.	Strategic Management, third amended edition, Institute for Market Research, Belgrade	2000	

Additional readings

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

	Assesment methods	**Points**	**Percentage**
Evaluation criteria	Pre-exam obligations		
	Presence during lectures	10	10%
	Positively evaluated seminary work	30	30%
	Project presentation		

	Exam/colloquium	40	40%
	Final exam		
	Final exam(verbally)	20	20%
	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 in Doboj		

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

Course title	**EXPERTISE OF TRAFFIC ACCIDENTS**
Department	Department for Transport Engineering – Faculty of Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СЖ02219326,0320	optional 3	II	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**	**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. understands the concept and significance of traffic accident expertise 2. correctly interprets the traces of a traffic accident 3. application of scientific methods in the process of traffic accident analysis 4. do a simpler analysis of traffic accidents
Prerequisites	A student may take the exam if he has passed the "Railway Safety" exam
Teaching methods	Lectures ex chair, workshops, discussion, focus groups, individual and group work
Course content	1. Introduction, subject and method of study. 2. Legal basis of expertise, place and role of traffic technical expertise in court proceedings 3. Methodology of traffic-technical analysis of traffic accidents 4. Ways of expressing the views of experts 5. Content of the expert's findings and opinion: Basic data 6. Classification of traces of a traffic accident 7. Content of the expert's findings and opinion: Expert's report - analysis of injuries and damage to vehicles 8. Content of the expert's findings and opinion: Expert's finding - analysis of traces of vehicle movement 9. Content of the expert's findings and opinion: Expert's finding - analysis of traces on light bulbs 10. Calculation of vehicle speeds that participated in a traffic accident 11. Determining the place of collision 12. Defining omissions in connection with a traffic accident 13. Use of computers and specialized software in traffic accident expertise 14. Specifics of expertise of individual traffic accidents 15. Specifics of expertise of individual traffic accidents

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Dragač Radoslav i Vujanić Milan	Traffic Safety Part II, Faculty of Transport and Traffic Engineering, University of Belgrade	2002	79-220
Vujanić Milan, Antić Boris, Pešić Dalibor i Lipovac Krsto	Collection of tasks in traffic safety, with practicum, Faculty of Transport and Traffic Engineering, University of Belgrade	2015	1-240

Additional readings

Author/s	**Name of publication, editor**	**Year**	**Pages (from-to)**
Lipovac Krsto	Investigation of traffic accidents - Elements of traffic trasology, Higher School of Internal Affairs, Belgrade	2000	1-208

	Assesment methods	**Points**	**Percentage**
Evaluation criteria	Pre-exam obligations		
	Presence during lectures	10	10%
	Positively evaluated seminary work	20	20%

	Exam/colloquium	15	15%
	Final exam		
	wrriten	35	35%
	verbally	20	20%
	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 in Doboj		

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

Course title	**DETERMINISTIC MODELS OF OPERATIONAL RESEARCH**
Department	Department for Transport Engineering – Faculty of Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СЖ02218426,0320	optional 4	II	6.00

Professor/s	PhD Suzana Miladić-Tešić, Assistant 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**	**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	Students will be trained to: 1. selection of the type of mathematical model for the given optimization tasks 2. solving complex tasks by performing optimization by applying linear and integer programming 3. performing sensitivity analysis to changes in input parameters 4. Identifying the advantages and disadvantages of deterministic models of operational research 5. monitoring the performance of traffic systems
Prerequisites	None
Teaching methods	Lectures, exercises, consultations, seminar work
Course content	1. Modeling of practical tasks with linear and integer programming models 2. Sensitivity analysis 3. Application of appropriate software 4. Duality 5. Economic interpretation of dual variables 6. Case studies 7. Colloquium I 8. Tasks of allocating workers and resources 9. Multi-stage transport tasks 10. Dynamic models 11. Nonlinear programming 12. Optimization of the function of one or more variables without and with constraints 13. Applications in traffic and transport 14. Simulation, Application of appropriate software 15. Colloquium II

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

Additional readings

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

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	Presence during lectures		
	Positively evaluated seminary work	20	20%
	Exam/colloquium	40	40%
	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 in Doboj		

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

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СЖ02220426,0320	optional 4	II	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**	**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 overall 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 Management Guidelines	*Managing Risk in Large Projects and Complex Procurements*,John Wiley	2004	

Additional readings

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

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	Presence during lectures	10	10%
	Positively evaluated seminary work	20	20%
	Exam/colloquium	30	30%

	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 in Doboj		

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

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СЖ02220526,0320	optional 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 to understand 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 Traffic engineering 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

Additional readings

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

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	Presence during lectures	10	10%
	Positively evaluated project work	20	20%

	Solved all colloquiums(tasks)	20	20%
	Solved all colloquiums(theory)	20	20%
	Final exam		
	Final exam(verbally)	30	30%
	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 in Doboj		

LOGISTICS

UNIVERSITY OF EAST SARAJEVO
Faculty of Transport and Traffic Engineering Doboj

II CYCLE / TRAFFIC /
Logistics

I year of study									
Number	**Code**	**Course title**	**Course status**	**Conditionality**	**Semester**	**Hours per semester**			**ECTS**
						L	**TE**	**LE**	
1.	САФ12СЛ02118016,0320	Methodology of scientific research work	M		I	3	2	0	6
2.	САФ12СЛ02118116,0320	Models, simulations and animations in traffic	M		I	3	1	1	6
3.	САФ12СЛ02120616,0320	Planning and design of logistics centers	M		I	3	1	1	6
4.	САФ12СЛ02220716,0320	1. Operational planning of transhipment processes	O_1		I	3	2	0	6
	САФ12СЛ02220816,0320	2. Logistics system performance modeling							
	САФ12СЛ02220916,0320	3. Logistics marketing management							
5.	САФ12СЛ02221016,0320	1. Logistics of hazardous materials	O_2		I	3	1	1	6
	САФ12СЛ02221116,0320	2.supply chain modeling and management							
	САФ12СЛ02221216,0320	3.quality management methods in logistics							
6.	САФ12СЛ02221326,0320	1. Special areas of return logistics	O_3		II	3	2	0	6
	САФ12СЛ02221426,0320	2. Special areas of city logistics							
	САФ12СЛ02221526,0320	3. Goods terminals							
7.	САФ12СЛ02221626,0320	1. Intermodal transport technologies	O_4		II	3	2	0	6
	САФ12СЛ02221726,0320	2. Logistics organization design							
	САФ12СЛ02221826,0320	3. Warehouse systems management							
8.	САФ12СЛ021194218,01600	Master thesis	M		II	16	0	0	18
					TOTAL	**37**	**11**	**3**	**60**

Profile: *Master of traffic - 300 ECTS -* ***Logistics***

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

Course title	**METHODOLOGY OF SCIENTIFIC RESEARCH WORK**
Department	Department for Transport Engineering – Faculty of Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СЛ02118016,0320	mandatory	I	6.00

Professor/s	PhD Perica Gojković, Full Professor; PhD Zoran Ćurguz, Associate Professor
Associate/s	Bojana Ristić, 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	X*15*S_o	Y*15*S_o	Z*15*S_o	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	1. Introducing students with methods used in the preparation of scientific research papers 2. Introducing students to the techniques used in the preparation of scientific research papers 3. mastering the writing and defense of the thesis 4. independent preparation of seminar paper
Prerequisites	no
Teaching methods	Lectures, auditory exercises, consultations
Course content	1. The concept, subject, significance and historical development of the methodology of scientific research 2. Basic scientific theories and research 3. Methods of scientific research 4. Conceptual foundations of research (concepts, theories and models, formulation and explanation of research topics and problems, defining the subject and goal of research, formulating research hypotheses) 5. Research approaches, strategies and planning (selection of research methods, determination of population and research sample) 6. Theoretical review of research (review of literature and research in accordance with the concept of research), first colloquium 7. Operationalization of research (measurement of economic variables, typology of data, search of primary and secondary sources, arranging and analyzing data, testing hypotheses) 8. Research instruments; notion of instruments, types of instruments, competition of instruments 9. Sample; concept, types, procedures and sampling techniques 10. Project of scientific research work 11. Methodology and technology of making a scientific work 12. Discussion of results 13. Writing a research report and conclusions 14. Preparation of bibliographic papers, technical processing of a scientific work, second colloquium

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Zakic M.:	Methodology of scientific research, Faculty of Law, Banja Luka	2000	
Colakhodzic E.:	Methodology and technology of scientific research work, Faculty of Teacher Education, Džemal Bijedić University, Mostar	2021	

Additional readings

Author/s	**Name of publication, editor**	**Year**	**Pages (from-to)**
Stanivukovic D.:	Method of scientific work, Faculty of Technical Sciences, Novi Sad		

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**

	Pre-exam obligations		
	attendance at lectures / exercises	5	5%
	teaching activity	5	5%
	positively graded seminar paper	20	20%
	colloquium	40	40%
	Final exam		
	Oral exam	30	30%
	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 in Doboj		

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering ***Study program: Traffic*** ***Profile: Logistics*** 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**
САФ12СЛ02118116,0320	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. optimizes traffic processes 2. models traffic processes 3. simulates traffic processes 4. animates traffic processes
Prerequisites	Does not have
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	**Assesment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	attendance at lectures / exercises	10	10%

	positively assessed seminary work / project / essay	10	20%
	case study - group work	10	10%
	test / colloquium	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		
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 program: Traffic*** ***Profile:***	
	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**
САФ12СЛ02120616,0320	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	No special conditions
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	**Assesment methods**	**Points**	**Percentage**
	Preexamination obligations		
	attendance during lectures	5	5%
	attendance during exercise	5	5%
	seminar work	10	10%
	colloquiums	2x25	50%
	Final examination		

	oral examionation	30	30%
	Overall	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 program: Traffic*** ***Profile: Logistics*** II cycle | I year of study	

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СЛ02220716,0320	optional 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	

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Preexamination obligations		
	attendance during lectures/exercise	10	10%
	Project presentation	10	10%
	seminar work	10	10%

	Colloquium1	20	20%
	Colloquium2	20	20%
	Final examination		
	oral examionation	30	30%
	Overall	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 program: Traffic*** ***Profile: Logistics*** II cycle | I year of study	

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СЛ02220816,0320	optional 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)**			**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 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	**Assesment methods**	**Points**	**Percentage**
	Preexamination obligations		
	attendance during lectures/exercise	5	5%
	activity	5	5%

	seminar work	20	20%
	tests	10	20%
	Colloquium1	15	15%
	Colloquium2	15	15%
	Final examination		
	oral examionation	30	30%
	Overall	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 program: Traffic*** ***Profile: Logistics*** II cycle | I year of study	

Course title	**LOGISTICS MARKETING MANAGEMENT**
Department	Department of Transport Engineering - Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СЛ02220916,0320	optional 1	I	6.00

Professor/s	PhD Svetlana Terzić, Associate Professor
Associate/s	PhD Svetlana Terzić, 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 the concepts of approaches and dimensions of marketing management in logistics 2. students get acquainted in more detail with different approaches and procedures of marketing management 3. to be able to independently apply certain modalities of planning, organization and management of marketing activities of logistics systems 4. apply the acquired knowledge in practice
Prerequisites	No special conditions
Teaching methods	Lectures, exercises, video presentations, simulations, presentations
Course content	1. Approaches and dimensions of marketing management in logistics 2. Research the marketing environment 3. Planning and control of marketing activities 4. Organization of marketing functions in logistics systems 5. Marketing decision making 6. Marketing Information System (MIS) 7. Strategic analysis and selection of marketing strategies 8. Logistics market positioning strategy 9. Manage promotional activities 10. Deciding on marketing instruments for logistics services 11. Development of a marketing plan and implementation of a marketing program; Creating a logistics service as an integral part of the concept of value for the consumer 12. Value chain logistics services management; Relationship Marketing and Customer Relationship Management (CRM) 13. Management of customer service satisfaction; Retention strategy 14. Modeling customer satisfaction and loyalty 15. Models of behavior of users of logistics services

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
M.J. Kilibarda	Marketing u logistici, Autorizovana skripta, Saobraćajni fakultet, Beograd, Srbija	2008	

Additional readings

Author/s	**Name of publication, editor**	**Year**	**Pages (from-to)**
A. Harrison and Remko van Hoek:	Logistics Management and Strategy, Prentice Hall, New York, USA	2005	

	Assesment methods	**Points**	**Percentage**
Evaluation criteria	Preexamination obligations		
	attendance during lectures/exercise	5	5%
	activity during classes	5	5%

	seminar work	20	20%
	Colloquium1	20	20%
	Colloquium2	20	20%
	Final examination		
	oral examionation	30	30%
	Overall	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 program: Traffic*** ***Profile: Logistics*** II cycle | I year of study	

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СЛ02221016,0320	optional 2	I	6.00

Professor/s	PhD Perica Gojković, 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	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 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	No special conditions
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 for Europe		
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	**Assesment methods**	**Points**	**Percentage**
	Preexamination obligations		
	attendance during lectures/exercise	5	5%
	activity during classes	5	5%
	seminar work	25	25%
	Colloquium1	20	20%
	Colloquium2	20	20%
	Final examination		
	oral examionation	25	25%
	Overall	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 program: Traffic ***Profile: Logistics***	
	II cycle / I year of study	

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СЛ02221116,0320	optional 2	I	6.00

Professor/s	PhD Slobodan Zečević, Full Professor
Associate/s	PhD Slobodan Zečević, 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=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. defines the structure of the process in the flows of materials from the source of raw materials to the final consumer 2. identifies and quantifies relevant parameters in the analysis and design of supply chains 3. choose the optimal supply chain strategy 4. masters supply chain management models
Prerequisites	No special conditions
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	**Assesment methods**	**Points**	**Percentage**

	Preexamination obligations		
	attendance during lectures/exercise	5	5%
	activity during classes	5	5%
	seminar work	30	30%
	Colloquium1	20	20%
	Colloquium2	20	20%
	Final examination		
	oral examionation	20	20%
	Overall	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 program: Traffic ***Profile: Logistics***	
	II cycle / I year of study	

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СЛ02221216,0320	optional 2	I	6.00

Professor/s	PhD Živko Erceg, Associate Professor
Associate/s	PhD Siniša Božičković, 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	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	No special conditions
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	

Additional readings

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

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Preexamination obligations		
	attendance during lectures/exercise	10	10%
	seminar work	20	20%
	Colloquium1	10	10%

	Colloquium2	10	10%
	Final examination		
	oral examionation	30	30%
	Overall	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 program: Traffic ***Profile: Logistics***	
	II cycle | I year of study	

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СЛ02221326,0320	optional 3	II	6.00

Professor/s	PhD Radovan Višković, Associate Professor
Associate/s	PhD Radovan Višković, 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 return logistics 2. expanding the knowledge of students in the field of return flows in logistics by getting acquainted with the concepts of modeling return flows in the network of return logistics in the collection of logistics flows 3. Introducing students to solving classic tasks in the field of return flows 4. apply the acquired knowledge in practice
Prerequisites	logistics in traffic
Teaching methods	lectures, tutorials, case studies, debate classes
Course content	1. Objectives of return logistics 2. Backflow logistics tasks 3. Logistics of return flows 4. Types of problems in return logistics networks 5. Defining problems and ways to solve return logistics processes 6. Waste management in return flow logistics 7. Preparation for the colloquium 8. Types of problems and ways to solve them in logistics of return flows (collection) 9. Management of electrical and electronic waste in logistics of return flows 10. PET materials and packaging in return logistics 11. Various approaches and ways of solving problems in return logistics 12. Models for shaping the structure of recycling logistics networks 13. Models of return logistics networks of empty logistics units 14. KANBAN system. (KANBAN system: problem analysis. Adaptation and rationalization of production and flows of materials and goods with the help of KANBAN system. Application of KANBAN system.) 15. Preparation for the colloquium

Textbook (s)

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

Additional readings

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

	Assesment methods	**Points**	**Percentage**
Evaluation criteria	Preexamination obligations		
	attendance during lectures/exercise	5	5%
	activity	5	5%
	seminar work	20	20%

	tests	10	10%
	Colloquium1	15	15%
	Colloquium2	15	15%
	Final examination		
	oral examionation	30	30%
	Overall	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 program: Traffic ***Profile: Logistics***	
	II cycle | I year of study	

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СЛ02221426,0320	optional 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	No special conditions
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 Logistics and Freight Transport,Ashgate Publishing Ltd	2012	-
Rushton A.	The Handbook of Logistics and Distribution Management, Kogan Page Publishers	2010	-

	Assesment methods	**Points**	**Percentage**
Evaluation criteria	Preexamination obligations		
	attendance during lectures/exercise	10	10%
	seminar work	30	30%
	Colloquium1	20	20%

	Colloquium2	20	20%
	Final examination		
	oral examionation	20	30%
	Overall	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 program: Traffic*** ***Profile: Logistics*** II cycle | I year of study	

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СЛ02221526,0320	optional 3	II	6.00

Professor/s	PhD Slobodan Zečević, Full 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 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	No special conditions
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.	

Additional readings

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

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Preexamination obligations		
	attendance during lectures/exercise	10	10%
	seminar work	20	20%
	Colloquium1	15	15%

	Colloquium2	15	15%
	Final examination		
	oral examionation	40	40%
	Overall	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 program: Traffic ***Profile: Logistics***	
	II cycle / I year of study	

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СЛ02221626,0320	optional 4	II	6.00

Professor/s	PhD Slobodan Zečević, Full 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 in terms 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	No special conditions
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-spoke networks, IOS/Delph	2006.	-

Additional readings

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

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Preexamination obligations		
	attendance during lectures/exercise	5	5%
	activity	5	5%

	seminar work	15	15%
	Colloquium1	20	20%
	Colloquium2	20	20%
	Final examination		
	oral examionation	35	35%
	Overall	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 program: Traffic*** ***Profile: Logistics*** II cycle | I year of study	

Course title	**LOGISTICS ORGANIZATION DESIGN**
Department	Department of Transport Engineering - Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СЛ02221726,0320	optional 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	No special conditions
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 са предавања, Нови Сад	2003	-
Rupper P.:	Transport, Lager und Logistic, Verlag Industrielle organisation, Zurich	1990	-

Additional readings

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

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Preexamination obligations		
	activity	10	10%
	project	25	25%
	Colloquium1	15	15%
	Colloquium2	20	20%
	Final examination		
	oral examionation	30	30%

	Overall	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 program: Traffic*** ***Profile: Logistics*** II cycle | I year of study	

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СЛ02221826,0320	optional 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	No special conditions
Teaching methods	lectures, tutorials, special exercise at warehouse system
Course content	1. Introduction to storage systems management 2. Data storage. Data bank 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	-

Additional readings

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

	Assesment methods	**Points**	**Percentage**
Evaluation criteria	Preexamination obligations		
	attendance during lectures/exercise	10	10%
	Seminar work	10	10%
	Colloquium1	15	15%
	Colloquium2	15	15%
	Final examination		
	oral examionation	50	50%
	Overall	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

TELECOMMUNICATIONS AND POSTAL TRAFFIC

UNIVERSITY OF EAST SARAJEVO

II CYCLE TRAFFIC/
(Telecommunications and postal traffic)

First year									
Ordinal number	**Course code**	**Course title**	**Status**	**Conditioned courses**	**Semester**	**Hours fund**			**ECTS**
						L	TE	LE	
1.	САФ12СТ02118016,0320	Methodology of scientific research work	O		I	3	2	0	6
2.	САФ12СТ02118116,0320	Models, simulations and animations in traffic	O		I	3	1	1	6
3.	САФ12СТ02121916,0320	Telematics systems	O		I	3	1	1	6
4.	САФ12СТ02222016,0320	1. Electronic systems in traffic	I_1		I	3	1	1	6
	САФ12СТ02222116,0320	2. Project management in postal traffic							
5.	САФ12СТ02210516,0320	1. Multimedia communications	I_2		I	3	1	1	6
	САФ12СТ02222216,0320	2. Communication systems in postal traffic							
6.	САФ12СТ02222326,0320	1. Selected chapters in the field of telecommunications	I_3		II	3	1	1	6
	САФ12СТ02222426,0320	2. New technologies in postal traffic							
7.	САФ12СТ02222526,0320	1. Application of renewable energy sources in transport systems	I_4		II	3	1	1	6
	САФ12СТ02222626,0320	2. Quality management in postal traffic							
8.	САФ12СТ021194218,01600	master thesis	O		II	16	0	0	18
					TOTAL:	**37**	**8**	**6**	**60**

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

Course title	**METHODOLOGY OF SCIENTIFIC RESEARCH WORK**
Department	Department of Transport Engineering - Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СТ02118016,0320	obligatory	I	6

Professor/s	PhD Perica Gojković, Full Professor; PhD Zoran Ćurguz, Associate Professor
Associate/s	Bojana Ristić, 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	X*15*S_o	Y*15*S_o	Z*15*S_o	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	1. Introducing students with methods used in the preparation of scientific research papers 2. Introducing students to the techniques used in the preparation of scientific research papers 3. mastering the writing and defense of the thesis 4. independent preparation of seminar paper
Prerequisites	no
Teaching methods	Lectures, auditory exercises, consultations
Course content	1. The concept, subject, significance and historical development of the methodology of scientific research 2. Basic scientific theories and research 3. Methods of scientific research 4. Conceptual foundations of research (concepts, theories and models, formulation and explanation of research topics and problems, defining the subject and goal of research, formulating research hypotheses) 5. Research approaches, strategies and planning (selection of research methods, determination of population and research sample) 6. Theoretical review of research (review of literature and research in accordance with the concept of research), first colloquium 7. Operationalization of research (measurement of economic variables, typology of data, search of primary and secondary sources, arranging and analyzing data, testing hypotheses) 8. Research instruments; notion of instruments, types of instruments, competition of instruments 9. Sample; concept, types, procedures and sampling techniques 10. Project of scientific research work 11. Methodology and technology of making a scientific work 12. Discussion of results 13. Writing a research report and conclusions 14. Preparation of bibliographic papers, technical processing of a scientific work, second colloquium

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
3. Zakic M.:	Methodology of scientific research, Faculty of Law, Banja Luka	2000.	
4. Colakhodzic E.:	Methodology and technology of scientific research work, Faculty of Teacher Education,	2021.	

	Džemal Bijedić University, Mostar		
Additional readings			
Author/s	**Name of publication, editor**	**Year**	**Pages (from-to)**
2. Stanivukovic D.:	Method of scientific work, Faculty of Technical Sciences, Novi Sad		

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	attendance at lectures / exercises	5	5 %
	teaching activity	5	5 %
	positively graded seminar paper	20	20 %
	colloquium	40	40 %
	Final exam		
	Oral exam	30	30 %
	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 in Doboj		

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering ***Study program: 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**
САФ12СТ02118116,0320	Obligatory	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. optimizes traffic processes 2. models traffic processes 3. simulates traffic processes 4. animates traffic processes
Prerequisites	Does not have
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	2009.	1-135

	Novi Sad		

	Assesment methods	Points	Percentage
Evaluation criteria	Pre-exam obligations		
	attendance at lectures / exercises	10	10%
	positively assessed seminary work / project / essay	10	20%
	case study - group work	10	10%
	test / colloquium	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		
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 program: Traffic*** ***Profile: Telecommunications and postal traffic*** IIcycle | I year of study	

Course title	**TELEMATICS SYSTEMS**
Department	Department of Information - Communication Systems in Traffic - Faculty of Transportation Doboj

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СТ02121916,0320	elective	I	6.0

Professor/s	PhD Aleksandar Stjepanović, Associate 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	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 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**	

Additional readings

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

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Pre-exam obligations		

	attendance at lectures / exercises	5	5%
	positively graded seminar paper	15	15%
	Colloquium 1	15	15%
	Colloquium 2	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 in Doboj		

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

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СТ02222016,0320	elective	I	6,0

Professor/s	PhD Miroslav Kostadinović, Associate 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	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 and 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 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 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	

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

	Assesment methods	**Points**	**Percentage**
	Assesment methods		
Evaluation criteria	Pre-exam obligations		
	presence in lectures / exercises	10	10%
	positively evaluated seminar work	10	10%
	Colloquium 1	15	15%
	Colloquium 2	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 in Doboj		

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

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СТ02222116,0320	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: $W+T=U_{opt}$= 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. 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. recognizes and defines the role and place of project and investment management; 4. Performs performance improvement in project management.
Prerequisites	There is no prior conditionality
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.	

	Assesment methods	Points	Percentage
Evaluation criteria	Pre-exam obligations		
	attendance continued	10	10 %
	activity during classes	5	5 %
	positively graded seminar paper	10	15 %
	colloquia	2 x 25	50%
	Final exam		
	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 in Doboj		

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

Course title	**MULTIMEDIA COMMUNICATIONS**
Department	Department of Information - Communication Systems in Traffic - Faculty of Transportation Doboj

Code	**Course status**	**Semester**	**ECTS credits**
CAΦ12CT02210516,0320	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	There is no prior conditionality
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-googlemaps 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**	

Additional readings

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

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Pre-exam obligations		

	attendance at lectures / exercises	5	5%
	positively graded seminar paper	15	15%
	Colloquium 1	15	15%
	Colloquium 2	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 in Doboj		

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

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СТ02222216,0320	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		

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

	Assesment methods	**Points**	**Percentage**
Evaluation criteria	Pre-exam obligations		
	attendance at lectures / exercises	5	5%
	positively graded seminar paper	15	15%
	Colloquium 1	15	15%
	Colloquium 2	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 in Doboj		

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering ***Study program: Traffic*** ***Profile: The road transport and traffic*** II cycle | I year of study	

Course title	**SELECTED CHAPTERS IN THE FIELD OF TELECOMMUNICATIONS**
Department	

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СТ02222326,0320			

Professor/s	
Associate/s	

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	
Prerequisites	
Teaching methods	
Course content	

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

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

	Assesment methods	**Points**	**Percentage**
Evaluation criteria			

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 program: Traffic*** ***Profile: Telecommunications and postal traffic*** II cycle | I year of study	

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СТ02222426,0320	elective	II	6,00

Professor/s	PhD Dejan Marković, Full Professor
Associate/s	PhD Dejan Marković, 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	After successfully passing the course, the student will be able to apply the knowledge from 1. Counter business technology 2. Information technologies in postal traffic 3. Electronic services in postal traffic 4. Automation of money transactions in the post office
Prerequisites	Conditions for taking the course are: 1. regular class attendance (lectures and exercises), 2. completed and defended project task, 3. passed all colloquia
Teaching methods	Lectures, auditory exercises, laboratory exercises, consultations
Course content	1. Automation of counter operations. Modern counters 2. Counter system configurations 3. Informatization (information kiosks) and management of postal systems management 4. Electronic and hybrid mail in modern automated processes 5. Automation in electronic services, e-mail, electronic brand and user applications 6. The impact of automation on the quality of postal services and electronic services 7. I colloquium 8. Automatic and mobile office 9. Postal information system 10. Automation of new services in postal traffic 11. Automation in postal logistics systems 12. Reliability of automatic technical systems and automatic diagnostics 13. Automation of self-service money transactions in the post office 14. Computer-assisted quality 15. II colloquium

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Bukumirović M.	Automatizacija procesa rada u poštanskim sistemima, Faculty of Transport and Traffic Engineering, Belgrade	1999.	

Additional readings

Author/s	**Name of publication, editor**	**Year**	**Pages (from-to)**
Dobrodolac, M.; Marković,	Eksploatacija poštanskog saobraćaja, Faculty of	2016.	

D., Blagojević, M.	Transport and Traffic Engineering, Belgrade		

	Assesment methods	Points	Percentage
Evaluation criteria	Pre-exam obligations		
	attendance at lectures / exercises	10	10%
	completed and positively evaluated project task	20	20%
	Colloquium 1	20	20%
	Colloquium 2	20	20%
	Passed tests	10	10 %
	Final exam		
	oral exam	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 in Doboj		

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

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СТ02222526,0320	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	No
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	

Additional readings

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

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	presence in lectures / exercises	5	5%
	positively evaluated seminar work	15	15%
	Colloquium 1	15	15%
	Colloquium 2	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 in Doboj		

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

Course title	**QUALITY MANAGEMENT IN POSTAL TRAFFIC**
Department	Department of Transport Engineering - Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СТ02222626,0320	elective	II	6,00

Professor/s	PhD Đorđe Popović, Associate Professor
Associate/s	PhD Đorđe Popović, 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	After acquainting the student with the basic concepts and aspects of quality management, and successfully passing the course, the student will be able to independently apply existing and develop new models of quality management.
Prerequisites	There is no prior conditionality
Teaching methods	Lectures, auditory exercises, laboratory exercises, consultations
Course content	1. Quality and quality management. The concept of quality. 2. Quality global vision of the future. Quality and social responsibility. 3. Definitions in the field of quality management. 4. Development of quality assurance, ie quality management. 5. Product quality. 6. SPC methods. 7. Analysis of process stability and accuracy. 8. Approach to the introduction of quality management systems. Purpose of quality management system documentation. 9. Development of procedures. Building business processes. Flowchart. 10. Process management through quality cost management. 11. The concept of continuous quality improvement. Quality loop. 12. Integrated management systems. Structure. Integration methods. 13. Total Quality Management (TQM). The role of TQM. 14. Models of excellence. 15. QMS tools and techniques.

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Bobrek, M.	QMS Design, Faculty of Mechanical Engineering, Banja Luka,	2000.	
Bobrek, M. i dr.	Upravljanje kvalitetom, Faculty of Mechanical Engineering, Banja Luka	2006.	

Additional readings

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

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Pre-exam obligations		

	attendance at lectures / exercises	10	10%
	completed and positively evaluated project task	20	20%
	Colloquium 1	20	20%
	Colloquium 2	20	20%
	passed tests	10	10 %
	Final exam		
	Oral exam	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 in Doboj		

INFORMATICS IN TRAFFIC

UNIVERSITY OF EAST SARAJEVO

II CYCLE TRAFFIC /
(Informatics in traffic)

First year									
Ordinal number	**Course code**	**Course title**	**Status**	**Conditioned courses**	**Semester**	**Hours fund**			**ECTS**
						L	TE	LE	
1.	САФ12СИ02118016,0320	Methodology of scientific research work	O		I	3	2	0	6
2.	САФ12СИ02118116,0320	Models, simulations and animations in traffic	O		I	3	1	1	6
3.	САФ12СИ02124516,0320	Selected chapters in software engineering	O		I	3	1	1	6
4.	САФ12СИ02209316,0320	1. Design and application of digital systems	I_1		I	3	1	1	6
	САФ12СИ02224616,0320	2. Design of computer networks							
	САФ12СИ02224716,0320	3. Design and application of information systems							
5.	САФ12СИ02224816,0320	1. Design of microprocessor systems	I_2		I	3	1	1	6
	САФ12СИ02221916,0320	2. Telematics systems							
	САФ12СИ02222016,0320	3. Electronic systems in traffic							
6.	САФ12СИ02210326,0320	1. Network management and services	I_3		II	3	1	1	6
	САФ12СИ02223826,0320	2. Application of GIS							
	САФ12СИ02224926,0320	3. Wireless Sensor Networks							
7.	САФ12СИ02225026,0320	1. Parallel computing systems	I_4		II	3	1	1	6
	САФ12СИ02225126,0320	2. User interfaces programming							
	САФ12СИ02222526,0320	3. Application of renewable energy sources in transport systems							
8.	САФ12СИ021194218,01600	Master thesis	O		II	16	0	0	18
TOTAL:						**37**	**8**	**6**	**60**

Output profile: master of traffic - 300 ECTS – informatics in traffic

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

Course title	**METHODOLOGY OF SCIENTIFIC RESEARCH WORK**
Department	Department of Transport Engineering - Faculty of Transport and Traffic Engineering Doboj

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СИ02118016,0320	obligatory	I	6

Professor/s	PhD Perica Gojković, Full Professor; PhD Zoran Ćurguz, Associate Professor
Associate/s	Bojana Ristić, 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	$X*15*S_o$	$Y*15*S_o$	$Z*15*S_o$	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	1. Introducing students with methods used in the preparation of scientific research papers 2. Introducing students to the techniques used in the preparation of scientific research papers 3. mastering the writing and defense of the thesis 4. independent preparation of seminar paper
Prerequisites	no
Teaching methods	Lectures, auditory exercises, consultations
Course content	1. The concept, subject, significance and historical development of the methodology of scientific research 2. Basic scientific theories and research 3. Methods of scientific research 4. Conceptual foundations of research (concepts, theories and models, formulation and explanation of research topics and problems, defining the subject and goal of research, formulating research hypotheses) 5. Research approaches, strategies and planning (selection of research methods, determination of population and research sample) 6. Theoretical review of research (review of literature and research in accordance with the concept of research), first colloquium 7. Operationalization of research (measurement of economic variables, typology of data, search of primary and secondary sources, arranging and analyzing data, testing hypotheses) 8. Research instruments; notion of instruments, types of instruments, competition of instruments 9. Sample; concept, types, procedures and sampling techniques 10. Project of scientific research work 11. Methodology and technology of making a scientific work 12. Discussion of results 13. Writing a research report and conclusions 14. Preparation of bibliographic papers, technical processing of a scientific work, second colloquium

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
5. Zakic M.:	Methodology of scientific research, Faculty of Law, Banja Luka	2000.	
6. Colakhodzic E.:	Methodology and technology of scientific research work, Faculty of Teacher Education,	2021.	

	Džemal Bijedić University, Mostar		
Additional readings			
Author/s	**Name of publication, editor**	**Year**	**Pages (from-to)**
3. Stanivukovic D.:	Method of scientific work, Faculty of Technical Sciences, Novi Sad		

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	attendance at lectures / exercises	5	5 %
	teaching activity	5	5 %
	positively graded seminar paper	20	20 %
	colloquium	40	40 %
	Final exam		
	Oral exam	30	30 %
	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 in Doboj		

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering ***Study program: Traffic*** ***Profile: Informatics in 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**
САФ12СИ02118116,0320	Obligatory	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. optimizes traffic processes 2. models traffic processes 3. simulates traffic processes 4. animates traffic processes
Prerequisites	Does not have
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	2009.	1-135

	Novi Sad		
Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	attendance at lectures / exercises	10	10%
	positively assessed seminary work / project / essay	10	20%
	case study - group work	10	10%
	test / colloquium	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		
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 program: Traffic*** ***Profile: Informatics in traffic*** II cycle | I year of study	

Course title	**SELECTED CHAPTERS IN SOFTWARE ENGINEERING**
Department	Department of computers, information technologies and biotechnology, ETF, University of East Sarajevo

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СИ02124516,0320	mandatory	I	6,0

Professor/s	PhD Gordana Jotanović, Associate Professor
Associate/s	PhD Gordana Jotanović, 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	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 = U_{opt} = 75+ 105 = 180 hours per semester	

Course aims and learning outcomes	After the training: 1. students should independently manage the software process, 2. students should independently model software systems applicable in traffic, 3. students should master the design of software systems in traffic, 4. students should design user interface with application in traffic.
Prerequisites	No
Teaching methods	Lectures and laboratory exercises
Course content	1. Basic concepts related to software engineering. 2. Models for software processes. 3. Software process management. 4. Modelling of software systems applicable in traffic. 5. Use of prototypes in traffic. 6. Formal specification. 7. Design of software systems in traffic. 8. Colloquium 1 9. User interface design with traffic application. 10. Statistical verification. 11. Software testing. 12. Maintenance and evolution. 13. Configuration Management. 14. Software re-engineering. 15. Colloquium 2

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Tsui, Frank, Orlando Karam, and Barbara Bernal	Essentials of software engineering. Jones & Bartlett Learning.	2022	
Haberfellner, Reinhard, et al.	Systems engineering. Cham: Springer International Publishing.	2019	
Ian Sommerville	Software Engineering, 9th edition. Addison-Wesley, Boston, MA, USA	2011	

Pierre B. and Richard E	Guide to the Software Engineering Body of Knowledge, Version 3.0, SWEBOK. IEEE	2014	
Shari Lawrence Pfleeger, Joanne M. Atlee	Software Engineering Theory and Practice,Pearson Education	2006	

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

	Assesment methods	**Points**	**Percentage**
Evaluation criteria	Pre-exam obligations		
	presence in lectures / exercises	10	10%
	positively evaluated seminar work	10	10%
	Colloquium 1	15	15%
	Colloquium 2	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 in Doboj		

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

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СИ02209316,0320	elective	I	6,0

Professor/s	PhD Miroslav Kostadinović, Associate 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	1 Introduction. Construction and structure of digital systems. Application of digital systems 2 Procedures and basic stages in digital system design 3 Ways and styles of design. Project documentation 4 Basic parameters of digital circuits and systems 5 Design and application of combination assemblies and systems 6 Components and criteria for selection of real combination systems 7 State Automats and State Diagrams (Colloquium 1) 8 Design and application of sequential assemblies and systems 9 Optimization of real sequential systems 10 Programmable logic circuits and their application in digital system design 11 Combinational and sequential programmable logic components 12 Design approach with microprocessors and microcontrollers 13 Display of a specific microcontroller 14 Hardware and software design support with microcontrollers 15 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			
Author/s	**Name of publication, editor**	**Year**	**Pages (from-to)**

	Assesment methods	**Points**	**Percentage**
Evaluation criteria	**Assesment methods**		
	Pre-exam obligations		
	presence in lectures / exercises	10	10%
	positively evaluated seminar work	10	10%
	Colloquium 1	15	15%
	Colloquium 2	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 in Doboj		

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering ***Study program: 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**
САФ12СИ02224616,0320	elective	I	6,00

Professor/s	PhD Goran Jauševac, 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**
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	**Assesment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	attendance at lectures	10	10%
	laboratory exercises	10	10%
	I Colloquium	20	20%
	II Colloquium	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		
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 program: 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**
САФ12СИ02224716,0320	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**	

Additional readings

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

	Assesment methods	**Points**	**Percentage**
Evaluation criteria	attendance at lectures / exercises	5	
	positively graded seminar paper	15	
	colleqium 1	15	
	colleqium 2	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		
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 program: Traffic*** ***Profile: Informatics in traffic*** II cycle | I year of study	

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СИ02224816,0320	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	2011.	

	River, New Jersey, USA.		

	Assesment methods	Points	Percentage
Evaluation criteria	Pre-exam obligations		
	presence in 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		
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 program: Traffic*** ***Profile: Informatics in traffic*** II cycle | I year of study	

Course title	**TELEMATICS SYSTEMS**
Department	Department of Information - Communication Systems in Traffic - Faculty of Transportation Doboj

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СИ02221916,0320	elective	I	6.0

Professor/s	PhD Aleksandar Stjepanović, Associate 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	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. 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)**
B. Stjepanović, M. Kostadinović	Telematski sistemi, University of East Sarajevo	**2020**	

Additional readings

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

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	attendance at lectures / exercises	5	5%

	positively graded seminar paper	15	15%
	Colloquium 1	15	15%
	Colloquium 2	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 in Doboj		

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

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СИ02222016,0320	elective	I	6,0

Professor/s	PhD Dragan Peraković, Full Professor
Associate/s	PhD Dragan Peraković, 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) 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: 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 and 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 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 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	

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

	Assesment methods	**Points**	**Percentage**
	Assesment methods		
Evaluation criteria	Pre-exam obligations		
	presence in lectures / exercises	10	10%
	positively evaluated seminar work	10	10%
	Colloquium 1	15	15%
	Colloquium 2	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 in Doboj		

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

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СИ02210326,0320	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	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. 2. Master the basic techniques of maintaining telecommunications and computer networks and services. 3. 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	No
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.TMN6.TCP / IP protocols (**I colloquium**) 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. **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	
Held, G.	Understanding Data Communications (3rd Edition), J. Wiley & Sons	2001.	
Held, G.	Internetworking LANs and WANs (2nd Edition), J. Wiley & Sons	2001.	

Additional readings

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

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	attendance at lectures	10	10%
	laboratory exercises	10	10%
	I Colloquium	20	20%
	II Colloquium	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		
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 program: Traffic*** ***Profile: Informatics in traffic*** II cycle | I year of study	

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СИ02223826,0320	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) 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	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	No prior conditionality
Teaching methods	Lectures, auditory exercises, laboratory exercises, consultations
Course content	1 The place and role of geoinformation systems (GIS). 2 Introduction to GIS. Basic concepts and terminology. 3 Geospatial data infrastructure. Spatial reference frames. 4 Spatial object modeling, GIS data model, raster and vector models, geometry, topology and topography of space. 5 Decomposition of space elements. 6 GIS system architecture. Space databases. 7 Interpretation and presentation of spatial data. 8 I colloquium. 9 Introduction to geospatial data visualization. Spatial analysis. GIS tools. 10 Standardization in the field of geoinformation systems and technologies - OpenGis, ISO TC211. 11 Service Oriented Architecture. 12 GIS - three-layer architecture. 13 Application of standards in the implementation of GIS systems. 14 Applications of GIS systems in different areas. 15 II colloquium.

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

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

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	Attendance at lectures / exercises	5	5%
	Positively graded seminar paper	15	15%
	Colloquium 1	15	15%
	Colloquium 2	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		
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 program: Traffic*** ***Profile: Informatics in traffic*** II cycle | I year of study	

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СИ02224926,0320	elective	I	6,00

Professor/s	PhD Dagan Peraković, Full Professor
Associate/s	PhD Dagan Peraković, 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) 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	No
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. **I colloquium** 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. **II colloquium**

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	

Additional readings

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

	Assesment methods	**Points**	**Percentage**
Evaluation criteria	Pre-exam obligations		
	attendance at lectures	10	10%
	laboratory exercises	10	10%

	I Colloquium	20	20%
	II Colloquium	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		
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 program: Traffic*** ***Profile: Informatics in traffic*** II cycle | I year of study	

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СИ02225026,0320	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 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: $W+T=U_{opt}$= 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: -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 I colloquium 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 Carlo analysis using parallelisms 14 Efficiency of parallel computing 15 II colloquium

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	

Additional readings

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

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	attendance at lectures/exercises	5	5%

	positively evaluated seminar work	15	15%
	Colloquium 1	15	15%
	Colloquium 2	15	15%
	Laboratory exercises	10	10%
	Final exam		
	oral exam	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 in Doboj		

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

Course title	**USER INTERFACES PROGRAMMING**
Department	Department of computers, information technologies and biotechnology, ETF, University of East Sarajevo

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СИ02225126,0320	elective	II	6,00

Professor/s	PhD Gordana Jotanović, Associate Professor
Associate/s	PhD Gordana Jotanović, 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	45	0	45	1,5

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 user interfaces and human computer interaction. 2. Students should acquire knowledge about principles, methods and tools for user interface development. 3. Students should acquire knowledge on design and development of user interfaces for traffic engineering domain.
Prerequisites	Object-oriented programming in Java.
Teaching methods	Lectures. Auditory exercises. Laboratory exercises. Seminary work.
Course content	1. Interactive systems. Human-computer interaction. 2 Guides, principles and theories. 3 User-centric design. 4. User interface design principles. 5. Design, prototyping and construction. 6. User interface design evaluation. 7. Interaction styles 8. Graphic design. 9. Visualization of information. 10. Internationalization. 11. Software architectures and user interfaces. 12. Interaction devices. 13. Web based and mobile user interfaces. 14. User manuals, online help and guides. Documentation. 15. Examples of application of user interfaces in traffic.

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
B. Shneiderman, C. Plaisant	Dizajniranje korisničkog interfejsa. Cet. Beograd. Srbija.	2005.	
Herbert Schildt	Java JDK9: Kompletan priručnik, prevod 10. izdanja. Mikroknjiga, Beograd, Srbija.	2018	

Additional readings

Author/s	**Name of publication, editor**	**Year**	**Pages (from-to)**
Jennifer Preece, Helen Sharp, Yvonne Rogers	Interaction Design: Beyond Human-Computer Interaction, 4th Edition. Wiley. USA.	2015.	

	Assesment methods	Points	Percentage
Evaluation criteria	Pre-exam obligations		
	presence in 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		
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 program: Traffic*** ***Profile: Informatics in traffic*** II cycle | I year of study	

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СИ02222526,0320	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	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 = 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	No
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	

Additional readings

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

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	presence in lectures / exercises	5	5%
	positively evaluated seminar work	15	15%
	Colloquium 1	15	15%
	Colloquium 2	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 in Doboj		

MOTOR VEHICLES

UNIVERSITY OF EASTERN SARAJEVO

II CYCLE TRAFFIC /
(MOTOR VEHICLES)

First year									
Serial number	**Item code**	**Name of the subject**	**Status**	**Conditional subjects**	**Semester**	**Fund of hours**			**ECTS**
						L	TE	LE	
1.	САФ12СМ02118016,0320	METHODOLOGY OF SCIENTIFIC RESEARCH WORK	O		I	3	2	0	6
2.	САФ12СМ02118116,0320	MODELS, SIMULATIONS AND ANIMATIONS IN TRAFFIC	O		I	3	1	1	6
3.	САФ12СМ02125216,0320	SENIOR ENGINEERING MATHEMATICS	O		I	3	2	0	6
4.	САФ12СМ02225316,0320	1. ADVANCED FLUID-GAS DYNAMICS	I_1		I	3	2	0	6
	САФ12СМ02225416,0320	2. ELASTICITY THEORY							
	САФ12СМ02225516,0320	3. TORSION OSCILLATIONS OF SUS ENGINES							
5.	САФ12СМ02225616,0320	1. SUS ENGINE CHARGING	I_2		I	3	2	0	6
	САФ12СМ02225716,0320	2. ENGINE DYNAMICS SUS							
	САФ12СМ02225816,0320	3. PROCESS MODELING IN ENGINES							
6.	САФ12СМ02225926,0320	1. VEHICLE ACTIVE SAFETY SYSTEM	I_3		II	3	2	0	6
	САФ12СМ02226026,0320	2. SPECIAL PURPOSE VEHICLES							
	САФ12СМ02226126,0320	3. ACCIDENT ANALYSIS							
7.	САФ12СМ02226226,0320	1. AERODYNAMICS AND VEHICLE DESIGN	I_4		II	3	2	0	6
	САФ12СМ02226326,0320	2. VEHICLE TRANSMISSION							
	САФ12СМ02226426,0320	3. UNCONVENTIONAL VEHICLE DRIVES							
8.	САФ12СМ021194218,01600	MASTER WORK	O		II	16	0	0	18
UKUPNO:						**37**	**13**	**1**	**60**

Output profile: master of traffic - 300 ECTS – motor vehicles

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering ***Study program: Traffic*** ***Profile:Motor Vehicles*** II cycle / I year of study	

Course title	**METHODOLOGY OF SCIENTIFIC RESEARCH WORK**
Department	

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СМ02118016,0320	obligatory	I	6

Professor/s	PhD Perica Gojković, Full Professor; PhD Zoran Ćurguz, Associate Professor
Associate/s	Bojana Ristić, 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	X*15*S_o	Y*15*S_o	Z*15*S_o	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	1. Introducing students with methods used in the preparation of scientific research papers 2. Introducing students to the techniques used in the preparation of scientific research papers 3. mastering the writing and defense of the thesis 4. independent preparation of seminar paper
Prerequisites	no
Teaching methods	Lectures, auditory exercises, consultations
Course content	1. The concept, subject, significance and historical development of the methodology of scientific research 2. Basic scientific theories and research 3. Methods of scientific research 4. Conceptual foundations of research (concepts, theories and models, formulation and explanation of research topics and problems, defining the subject and goal of research, formulating research hypotheses) 5. Research approaches, strategies and planning (selection of research methods, determination of population and research sample) 6. Theoretical review of research (review of literature and research in accordance with the concept of research), first colloquium 7. Operationalization of research (measurement of economic variables, typology of data, search of primary and secondary sources, arranging and analyzing data, testing hypotheses) 8. Research instruments; notion of instruments, types of instruments, competition of instruments 9. Sample; concept, types, procedures and sampling techniques 10. Project of scientific research work 11. Methodology and technology of making a scientific work 12. Discussion of results 13. Writing a research report and conclusions 14. Preparation of bibliographic papers, technical processing of a scientific work, second colloquium

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
7. Zakic M.:	Methodology of scientific research, Faculty of Law, Banja Luka	2000.	
8. Colakhodzic E.:	Methodology and technology of scientific research work, Faculty of Teacher Education, Džemal Bijedić University, Mostar	2021.	

Additional readings			
Author/s	**Name of publication, editor**	**Year**	**Pages (from-to)**
4. Stanivukovic D.:	Method of scientific work, Faculty of Technical Sciences, Novi Sad		

	Assesment methods	**Points**	**Percentage**
Evaluation criteria	Pre-exam obligations		
	attendance at lectures / exercises	5	5 %
	teaching activity	5	5 %
	positively graded seminar paper	20	20 %
	colloquium	40	40 %
	Final exam		
	Oral exam	30	30 %
	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 in Doboj		

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering ***Study program: Traffic*** ***Profile:Motor Vehicles*** 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**
САФ12СМ02118116,0320	Obligatory	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. optimizes traffic processes 2. models traffic processes 3. simulates traffic processes 4. animates traffic processes
Prerequisites	Does not have
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	2009.	1-135

	Novi Sad		

	Assesment methods	Points	Percentage
Evaluation criteria	Pre-exam obligations		
	attendance at lectures / exercises	10	10%
	positively assessed seminary work / project / essay	10	20%
	case study - group work	10	10%
	test / colloquium	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		
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 program: Traffic*** ***Profile:Motor Vehicles*** I cycle / I year of study	

Course title	**SENIOR ENGINEERING MATHEMATICS**
Department	

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СМ02125216,0320			

Professor/s	PhD Dagana Nedić, Associate Professor
Associate/s	PhD Dagana Nedić, 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 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	By mastering this course students will be able to learn: 1. numerical series, the concept of convergence and the necessary and sufficient conditions of convergence; 2. differentiation and integration of degree series; 3. integral theory; 4. classification of linear partial equations of the second order, reduction to canonical forms.
Prerequisites	does not have
Teaching methods	Lectures, auditory exercises, consultations
Course content	1. Numerical series. The concept of convergence, necessary and sufficient conditions of convergence 2. Functional rows. Uniform convergence 3. Developing functions in the Taylor and Mac-Laurent orders 4. Degrees of order, convergence intervals 5. Differentiation and integration of degree series 6. Fourier series. Developing a Fourier order function on an arbitrary segment 7. I colloquium 8. Development of Fourier series functions by sines or cosines of multiple angles 9. Partial differential equations (classification, general first order partial equation) 10. Integral theory. Lagrange-Charpita method 11. Classification of linear partial equations of the second order, reduction to canonical forms, setting initial and boundary conditions, methods of solving 12. Basics of complex analysis 13. Integrals of functions of a complex variable, Cauchy's integral theorem for single and multiple connected domains, 14. Laurent order, remainder and its application 15. Basics of tensor calculus. (II colloquium)

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Erwin Kreyszig:	Advanced engineering mathematics, John Wiley&Sons	2000.- VIII edition	
I.Aganović, K.Veselić	Linear differential equations, Introduction to boundary value problems, Element, Zagreb,	2001.	

Additional readings

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

D.S.Mitrinović	Complex analysis, Construction book, Belgrade	1981.	

	Assesment methods	Points	Percentage
Evaluation criteria	Pre-exam obligations		
	attendance at lectures / exercises	10	10%
	teaching activity		
	positively graded seminar paper		
	colloquium	60	60%
	Final exam		
	final exam (oral)	30	30%
	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 in Doboj		

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

Course title	**ADVANCED FLUID-GAS DYNAMICS**
Department	Department of Motor Vehicles, Operation, Maintenance and Diagnostics of Vehicles

Code	**Course status**	**Semester**	**ECTS credits**
CAΦ12CM02225316,0320			

Professor/s	PhD Milan Milotić, Associate Professor
Associate/s	PhD Milan Milotić, 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 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. To get acquainted with fluid flow, basic settings and definitions; 2. Analyze turbulent fluid motion; 3. They study the dynamics of compressible fluid; 4. Acquired knowledge in application practice.
Prerequisites	does not have
Teaching methods	Lectures, auditory exercises, consultations
Course content	1. Potential fluid flow: Basic settings and definitions. 2. Superposition of basic types of potential flows and some forms of complex flows (flow of cylindrical bodies 3. Application of the function of a complex variable - the principle of conformal mapping. 4. Turbulent fluid motion 5. Boundary layer: Concept and definitions. Empirical formulas. Equation of fluid motion in the boundary layer - Prandtl equation for the boundary layer. 6. Hydrodynamic vibrations 7. I colloquium 8. Boundary layer on a flat plate. Free turbulent flows: mixing layer, plane and circular jet, vortex trace. 9. Basic principles of functioning of hydraulic machines: Hydrostatic and hydrodynamic machines (HS and HD machines). 10. Euler's main turbine equation and the basic conclusions that follow from it. 11. Dynamics of compressible fluid: Properties of compressible fluid motion. 12. Disorder propagation and speed of sound. Mach number. 13. One-dimensional stationary isentropic flow of an ideal gas. 14. One-dimensional stationary flow in isolated channels (with friction). 15. Isothermal flow in gas pipelines and gas networks. (II colloquium)

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
K. Hanjalić	Compressible fluid dynamics, Light,	1977	
I. Demirdžić:	, Fluid Mechanics, Part I, Faculty of Mechanical Engineering Sarajevo,	1990	

Additional readings

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

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**

	Pre-exam obligations		
	attendance at lectures / exercises	10	10%
	teaching activity		
	positively graded seminar paper		
	colloquium	60	60%
	Final exam		
	final exam (oral)	30	30%
	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 in Doboj		

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering ***Study program: Traffic*** ***Profile:Motor Vehicles*** II cycle / I year of study	

Course title	**ELASTICITY THEORY**
Department	Department of Motor Vehicles, Operation, Maintenance and Diagnostics of Vehicles

Code	**Course status**	**Semester**	**ECTS credits**
CAΦ12CM02225416,0320			

Professor/s	PhD Milan Milotić, Associate Professor
Associate/s	PhD Milan Milotić, 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 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	By mastering this course students will be able to: 1. They study the theory of elasticity; 2. Analyze stresses and strains; 3. Apply experimental methods for determining stresses and defomations; 4. Apply the acquired knowledge on concrete examples.
Prerequisites	does not have
Teaching methods	Lectures, auditory exercises, consultations
Course content	1. Theory of elasticity - introduction 2. Stress analysis 3. Deformation analysis 4. Relationship between stress and strain 5. Solving the equations of the theory of elasticity 6. Torsion of straight rods 7. I colloquium 8. Flat problem of elasticity theory 9. Bending thin plates 10. Experimental methods for determining stresses and strains - introduction. Basic relations from the theory of elasticity and resistance of materials 11. Mechanics of model similarity. Determination of stresses and strains by brittle varnish. 12. Photoelascimetry - Basic concepts in optics, Wave equation, Light interference, Optical anisotropic materials 13. Photoelascimetry - Polaroid filters, Polariscopes, Analysis of models in plane polarized light, 14. Photoelascimetry - Compensation method, Recording of isoclines and isochromes, Separation of main stresses, 15. Photoelasticity - Materials, Special methods of photoelasticity, Model similarity in photoelasticity, Determination of stress concentration. (II colloquium)

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Vukojević Dušan	Elasticity theory with experimental methods, Faculty of Mechanical Engineering in Zenica,	1998.	
Rašković D.	Teorija elastičnosti, naučna knjiga Beograd,	1985.	

Additional readings

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

	Assesment methods	Points	Percentage
Evaluation criteria	Pre-exam obligations		
	attendance at lectures / exercises	10	10%
	teaching activity		
	positively graded seminar paper		
	colloquium	60	60%
	Final exam		
	final exam (oral)	30	30%
	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 in Doboj		

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering ***Study program: Traffic*** ***Profile:Motor Vehicles*** II cycle / I year of study	

Course title	**TORSION OSCILLATIONS OF SUS ENGINES**
Department	Department of Motor Vehicles, Operation, Maintenance and Diagnostics of Vehicles

Code	**Course status**	**Semester**	**ECTS credits**
CAФ12CM02225516,0320			

Professor/s	PhD Mesud Ajanović, Full Professor
Associate/s	PhD Mesud Ajanović, 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	By mastering this course students will be able to: 1. Analyze the simplification of the modeling-oscillatory system; 2. work on calculation methods; 3. investigate methods and mechanisms for mitigating torsional oscillations; 4. apply the acquired knowledge in practice.
Prerequisites	does not have
Teaching methods	Lectures, auditory exercises, consultations
Course content	1. Introduction 2. SUS engines 3. Definition of the basic torsional-oscillatory system 4. Defining the physical and mathematical model of the torsion-oscillatory system 5. Analysis of model simplification in order to more accurately calculate torsional-oscillatory parameters 6. Possible directions of model simplification in order to more accurately calculate torsional-oscillatory parameters 7. I colloquium 1. Introduction 2. SUS engines 3. Definition of the basic torsional-oscillatory system 4. Defining the physical and mathematical model of the torsion-oscillatory system 5. Analysis of model simplification in order to more accurately calculate torsional-oscillatory parameters 6. Possible directions of model simplification in order to more accurately calculate torsional-oscillatory parameters 7. I colloquium

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Filipović Ivan	Internal combustion engines-dynamics and oscillations, MF Sarajevo	2007.	
Hafner E.K., Maass H.	Theory of Trial Switches of the Conversion Machine, Springer Verlag, Vienna-New York,	1984.	

Additional readings

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

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**

	Pre-exam obligations		
	attendance at lectures / exercises	10	10%
	teaching activity		
	positively graded seminar paper		
	colloquium	60	60%
	Final exam		
	final exam (oral)	30	30%
	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 in Doboj		

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering ***Study program: Traffic*** ***Profile:Motor Vehicles*** II cycle / I year of study	

Course title	**SUS ENGINE CHARGING**
Department	Department of Motor Vehicles, Operation, Maintenance and Diagnostics of Vehicles

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СМ02225616,0320			

Professor/s	PhD Mesud Ajanović, Full Professor
Associate/s	PhD Mesud Ajanović, 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	By mastering this course students will be able to: 1. Get acquainted with possible and practical models of supplementation; 2. Consider the positive and negative sides of the introduction of the supplement system from the technical, economic and sociological aspects; 3. They study turbocharging systems; 4. Model processes in turbochargers.
Prerequisites	does not have
Teaching methods	Lectures, auditory exercises, consultations
Course content	1. Introduction 2. SUS engines 3. An overview of possible and practical ways of supplementing 4. Conditions preceding the possibility of introducing a replenishment system 5. Positive and negative sides of the introduction of the supplement system, from the technical aspect 6. Positive and negative sides of the introduction of the supplementary system from the economic and sociological aspect 7. I colloquium 8. Basic principles of individual elements of the recharging system - turbine and compressor 9. Turbocharging systems 10. Basic design parameters of turbocharging system. 11. Output parameters in the form of compressor and turbine maps 12. Modeling of processes in turbochargers of mechanical aspect 13. Modeling of processes in turbochargers from the gas-dynamic aspect 14. Basic parameters when choosing and connecting a turbocharger with a sus engine 15. Directions of further research (II colloquium)

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Filipović I.	Recharging piston engines, Faculty of Mechanical Engineering Sarajevo, Sarajevo	1984.	
Watson N.	Turbocharging the Internal Combustion Engine, Macmillan Publisher Ltd., London	1984.	
Zinner K.,	Refueling of engines, Springer - Verlag, Berlin	1985.	
Pucher H. u.a.,	Installation of combustion engines, expert expertise, self-service	1985.	

Additional readings

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

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	attendance at lectures / exercises	10	10%
	teaching activity		
	positively graded seminar paper		
	colloquium	60	60%
	Final exam		
	final exam (oral)	30	30%
	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 in Doboj		

	UNIVERSITY OF EAST SARAJEVO Faculty of Transport and Traffic Engineering ***Study program: Traffic*** ***Profile:Motor Vehicles*** II cycle / I year of study	

Course title	**ENGINE DYNAMICS SUS**
Department	Department of Motor Vehicles, Operation, Maintenance and Diagnostics of Vehicles

Code	**Course status**	**Semester**	**ECTS credits**
CAФ12CM02225716,0320			

Professor/s	PhD Mesud Ajanović, Full Professor
Associate/s	PhD Mesud Ajanović, 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 basic kinematic and dynamic parameters of the engine curve mechanism in order to check; 2. calculation of engine curve mechanism elements; 3. defining friction losses in the engine; 4. Defining methods for calculation of resonant modes of operation of SUS motors.
Prerequisites	does not have
Teaching methods	Lectures, auditory exercises, consultations
Course content	1. Basic concepts of the engine sus. 2. Basic concepts of dynamics. 3. Basic kinematic and dynamic quantities of the centric and deaxial curve mechanism of the engine sus. 4. Inertial forces and moments in single-cylinder and multi-cylinder engines sus. 5. Balancing inertial forces and moments. 6. The role and calculation of the engine flywheel. 7. I colloquium 8. Defining current values of forces and moments on the curve mechanism. 9. Polar bearing load diagrams. 10. Torsional oscillations of the engine crankshaft. 11. Torsional oscillations of the engine crankshaft. 12. Definition of equivalent system. 13. Calculation of natural oscillation frequencies. 14. Methods of avoiding critical oscillatory modes in motors. 15. Directions of further research. (II colloquium)

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Filipović I.	Internal combustion engines - dynamics and oscillations, MF Sarajevo	2007.	
Filipović Ivan	Kinematics and dynamics of motor mechanism, MF Sarajevo	1998.	
Filipović Ivan	Torsional oscillations of motor sui, MF Sarajevo	1998.	
Filipović I., Stojičić T.	Collection of tasks from the engine sus, MF Sarajevo,	1982.	

Additional readings

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

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	attendance continued	10	10%
	colloquium 1	30	30%
	colloquium 2	30	30%
	Final exam		
	final exam (oral)	30	30%
	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 in Doboj		

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

Course title	**PROCESS MODELING IN ENGINES**
Department	Department of Motor Vehicles, Operation, Maintenance and Diagnostics of Vehicles

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СМ02225816,0320			

Professor/s	Prof. PhD Mesud Ajanović, Full Professor
Associate/s	Prof. PhD Mesud Ajanović, 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 characteristics of the SUS engine; 2. Ways to solve certain problems in the operation of the SUS engine; 3. Solve the problem with modular programming; 4. Application of acquired knowledge on concrete examples.
Prerequisites	does not have
Teaching methods	Lectures, auditory exercises, consultations
Course content	1. Introduction 2. SUS engines 3. Zero, one and multidimensional models for individual systems and processes 4. Ways of solving - fuel supply system 5. Methods of solving - working fluid exchange system (distribution mechanism) 6. Methods of solving - current processes when changing the working substance 7. I colloquium 8. Ways of solving - combustion in the workspace 9. Ways of solving - heat exchange with the environment 10. Methods of solving - exhaust gases 11. Methods of solving - purification of exhaust gases 12. Mathematical models 13. Modular programming 14. Observation of individual engine systems sus 15. Observation of the engine sus as a whole (II colloquium)

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Heywood J. B.	Internal Combustion Engine Fundamentals, McGraww Hill International Editions, New York	1988.	
Jankov R.	Mathematical modeling of current-thermodynamic processes and operating characteristics of diesel engines - quasi-stationary models Part I, Scientific book Belgrade	1984.	

Additional readings

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

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Pre-exam obligations		

	attendance continued	10	10%
	colloquium 1	30	30%
	colloquium 2	30	30%
	Final exam		
	final exam (oral)	30	30%
	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 in Doboj		

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

Course title	**VEHICLE ACTIVE SAFETY SYSTEM**
Department	Department of Motor Vehicles, Operation, Maintenance and Diagnostics of Vehicles

Code	**Course status**	**Semester**	**ECTS credits**
CAΦ12CM02225926,0320			

Professor/s	PhD Božidar Krstić, Full Professor
Associate/s	PhD Božidar Krstić, 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. Deepening knowledge of motor vehicles related to the development of active vehicle safety systems; 2. Introduction to the principle of operation and modeling of ABS, ASR, ESP, etc. ; 3. Acquisition of knowledge that can be applied in the design phase of new ones; 4. Optimization of existing active security systems.
Prerequisites	does not have
Teaching methods	Lectures, auditory exercises, consultations
Course content	1. Introduction to active vehicle safety. 2. Available grip between tire and pad. 3. Optimal vehicle braking. 4. Braking a set of vehicles. 5. Modeling of hydraulic and pneumatic braking systems. 6. Regulation of the braking system. 7. I colloquium 8. Anti-lock Braking Systems (ABS). 9. Modeling and optimization of ABS operation. 10. Drive wheel slip control (ASR). 11. Modeling and optimization of ASR operation. 12. Electronic Stability Control (ESP). 13. Modeling and optimization of ESP operation. 14. Vehicle Distance Control (ACC) system. 15. Active elastic support system. Management system. (II colloquium)

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Johansson R., Rantzer A.	Nonlinear and Hybrid Systems in Automotive Control, Springer,	2003.	
Limpert R.	Brake Design and Safety, SAE, I,	1999.	

Additional readings

Author/s	**Name of publication, editor**	**Year**	**Pages (from-to)**
Janićijević N.,	Automation of motor vehicle systems, Faculty of Mechanical Engineering, Belgrade, Belgrade,	2002.	

	Assesment methods	**Points**	**Percentage**
Evaluation criteria	Pre-exam obligations		
	attendance continued	10	10%
	colloquium 1	30	30%

	colloquium 2	30	30%
	Final exam		
	final exam (oral)	30	30%
	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 in Doboj		

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

Course title	**SPECIAL PURPOSE VEHICLES**
Department	Department of Motor Vehicles, Operation, Maintenance and Diagnostics of Vehicles

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СМ02226026,0320			

Professor/s	PhD Božidar Krstić, Full Professor
Associate/s	PhD Božidar Krstić, 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	Dating students: 1. with classifications of special purpose vehicles; 2. with their characteristics; 3. with theories of movement of caterpillar vehicles; 4. with vehicle stability and overcoming obstacles.
Prerequisites	does not have
Teaching methods	Lectures, auditory exercises, consultations
Course content	1. Classification of special purpose vehicles. 2. Auxiliary drives of vehicles for the operation of special devices and equipment. 3. Vehicles with self-loading and self-unloading device. 4. Container vehicles. 5. Vehicles with liquid cargo containers. 6. Vehicles for transport of dangerous goods. 7. I colloquium 8. Trailers for special transport of long and indivisible loads and building structures. 9. Trailer with drive. 10. Tractors. Loaders. 11. Graders. Excavators. 12. Excavators. Auto cranes. 13. Vehicles for forest exploitation. 14. Theory of movement of caterpillar vehicles. Straight line movement and turning of a caterpillar vehicle. 15. Vehicle stability and overcoming obstacles. Combat vehicles. (II colloquium)

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Mikulić D.	Construction machines, construction, calculation and use, Zagreb,	1998.	
Janković D., Janićijević N.	Trailers and special devices, Faculty of Mechanical Engineering Belgrade, Belgrade,	1985.	

Additional readings

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

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	attendance continued	10	10%

	colloquium 1	30	30%
	colloquium 2	30	30%
	Final exam		
	final exam (oral)	30	30%
	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 in Doboj		

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

Course title	**ACCIDENT ANALYSIS**
Department	Department of Motor Vehicles, Operation, Maintenance and Diagnostics of Vehicles

Code	**Course status**	**Semester**	**ECTS credits**
CAФ12CM02226126,0320			

Professor/s	PhD Božidar Krstić, Full Professor
Associate/s	PhD Božidar Krstić, 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. Introducing students to the types of accidents and basic concepts and definitions; 2. Analysis of accidents depending on the cause; 3. Accident analysis according to the place of occurrence 4. Problem solving on concrete examples.
Prerequisites	does not have
Teaching methods	Lectures, auditory exercises, consultations
Course content	1. Types of accidents basic terms and definitions. Internal and external causes of crack formation. 2. Crack propagation. Fracture and violent fracture. Accidents due to corrosion, tribological processes, cavitation and erosion. 3. Breakdown mechanism failure: piston-connecting rod-crankshaft - causes of accidents. 4. Engine block failure: violent breakage, sealing, cylinder, cylinder liners 5. Cylinder head failure: cracks, fractures, erosion and corrosion. Rubbing the valve guides. 6. Distribution mechanism failures: springs, valves, camshaft. 7. I colloquium 8. Accidents of belt gears, chains and sprockets, V-belts and gears, chain gears and gears. 9. Fuel supply and positive ignition system failures. Engine cooling system failures. 10. Accidents on TK units. 11. Accidents in the power transmission system, couplings, gearbox, cardan shaft, differential 12. Accidents in the braking system, loss of working fluid, bursting of the installation, friction surfaces. 13. Accidents in the control system, loss of mechanical connection of control bodies, loss of working fluid 14. Accidents in the system of elastic suspension, causes of loss of vehicle stability, cracks in the axles 15. Total damage - example analysis. (II colloquium)

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Greuter E., Zima S.,	Motor damage - damage to advertising engines and waste, Vogel Buchverlag, Würzburg	2000.	
	ASPI Handbook, Failure Analysis and Prevention, Volume 11		

Additional readings

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

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	attendance continued	10	10%
	colloquium 1	30	30%
	colloquium 2	30	30%
	Final exam		
	final exam (oral)	30	30%
	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 in Doboj		

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

Course title	**AERODYNAMICS AND VEHICLE DESIGN**
Department	Department of Motor Vehicles, Operation, Maintenance and Diagnostics of Vehicles

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СМ02226226,0320			

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. Introducing students to the most important phenomena of air flow around the vehicle, vehicle resistance 2. Introducing students to the influence of air flow on the dynamic and energy characteristics of vehicles 3. Introducing students to the influence of air resistance on noise 4. apply the acquired knowledge in practice
Prerequisites	does not have
Teaching methods	Lectures, auditory exercises, consultations
Course content	1. Introduction to vehicle aerodynamics 2. Vehicle aerodynamics through past, present and future 3. External and internal aerodynamics 4. Air flow around the passenger vehicle 5. Participation of certain parts of the vehicle in air resistance 6. Passenger vehicle design strategies 7. I colloquium 8. Aerodynamic forces and moments 9. The importance of vehicle aerodynamics in vehicle behavior while driving 10. Influence of passenger vehicle shape on aerodynamic forces and moments 11. Noise due to air flow around the vehicle 12. Aerodynamics of high performance vehicles 13. Reduction of air resistance in trucks and buses. Motorcycle aerodynamics 14. Heating, ventilation and air conditioning of the passenger compartment. Aero tunnels 15. Basics of numerical methods in solving problems of external and internal aerodynamics (II colloquium)

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Hucho W.:	Aerodynamics of Road Vehicles, SAE, ISBN 0-7680-0029-7	1998.	
Braess H., Seiffert U.:	Handbook of Automotive Engineering, SAE, ISBN 0-7680-0783-6	2005.	

Additional readings

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

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Pre-exam obligations		

	attendance continued	10	10%
	colloquium 1	30	30%
	colloquium 2	30	30%
	Students who pass all colloquia are exempted from the written part of the examination.		
	Final exam		
	final exam (oral)	30	30%
	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 in Doboj		

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

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

Code	**Course status**	**Semester**	**ECTS credits**
САФ12СМ02226326,0320			

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. knowledge of concepts and definitions of transmission in motor vehicles 2. deepening of knowledge for one of the most important motor vehicle systems processed within the subject Motor Vehicles in order to optimize the power transmission system 3. Acquisition of knowledge that can be applied in the design phase of power transmission and torque to drive wheels 4. apply the acquired knowledge in practice
Prerequisites	does not have
Teaching methods	Lectures, auditory exercises, consultations
Course content	1. The role and tasks of transmission in motor vehicles. Types of transmissions. 2. Mechanical transmissions. 3. Continuously variable transmissions. Hydrodynamic transmissions. 4. Gear shift management process. 5. Pressure modulation devices. Design of pressure modulation devices. 6. Automatic transmission control systems. 7. I colloquium 8. Hydraulic control systems. 9. Electrohydraulic control systems. 10. Oils in hydrodynamic transmissions. 11. Oil purification and oil cooling system in hydrodynamic transmissions. 12. Modern solutions of automatic transmissions for passenger vehicles. 13. Modern solutions of automatic transmissions for commercial vehicles and buses. 14. Hydrostatic transmissions. 15. Electrical transmissions. (II colloquium)

Textbook (s)

Author/s	**Name of publication, publisher**	**Year**	**Pages (from-to)**
Lechner G., Naunheimer H.:	Automotive transmissions – Fundamentals, Selection, Design and Application, Springer, ISBN 3-540-65903	1999.	
Živanović Z., Janićijević N.:	Automatic transmissions of motor vehicles, ISBN 86-7905-033-4, Belgrade	1999.	
Braess H., Seiffert U.:	Handbook of Automotive Engineering, SAE, ISBN 0-7680-0783-6	2005.	

Additional readings

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

	Assesment methods	Points	Percentage
Evaluation criteria	Pre-exam obligations		
	attendance continued	10	10%
	colloquium 1	30	30%
	colloquium 2	30	30%
	Students who pass all colloquia are exempted from the written part of the examination.		
	Final exam		
	final exam (oral)	30	30%
	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 in Doboj		

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

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

Code	**Course status**	**Semester**	**ECTS credits**
CAФ12CM02226426,0320			

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 the concepts 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 in vehicles 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. I colloquium 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. (II colloquium)

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.	

Additional readings

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

Evaluation criteria	**Assesment methods**	**Points**	**Percentage**
	Pre-exam obligations		
	attendance continued	10	10%
	colloquium 1	30	30%
	colloquium 2	30	30%
	Students who pass all colloquia are exempted from the written part of the examination.		
	Final exam		
	final exam (oral)	30	30%
	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 in Doboj		