



UNIVERSITY OF PRISHTINA
“HASAN PRISHTINA”

FACULTY OF CIVIL ENGINEERING
DEPARTMENT ROAD INFRASTRUCTURE – MSc.

2012 – 2014

9.6 Study Programme for Road Infrastructure - Master Level

Application Form for Study Program Accreditation

Description (name) of the institution	Faculty of Civil Engineering and Architecture Faculty of Civil Engineering
Description (name) of the academic programme	Study program Road Infrastructure
NFQ Level (BA, MA, PhD, doctorate programme, university course)	Level 7 MA
Academic degree or certificate, spelled out in full and in abbreviated form	Master of Engineering – study programme : Road Infrastructure MSc. Of Civil Engineering
Profile of the academic programme / Scientific position	Road Infrastructure
Target group	Candidates who completed bachelor degree
Minimum period of study	minimum 2 years of studying.
Type, structure and cycle (full time or part time)	Full time
Number of ECTS	120 ECTS 60 ECTS per year
Programm (short overview)/Courses	Obligatory 1. Noise from traffic 2. Traffic techniques 3. Road Design 4. Railway Design 5. Road Construction Management 6. Road Construction – Upper layers 7. Bridges 8. Road Construction – Lower layers 9. Interchanges 10. Academic writing/ method of reserches

	<ul style="list-style-type: none"> 11. Tunnels 12. Airports 13. Road markings 14. Traffic junctions 15. Road Maintenance <p>Elective</p> <ul style="list-style-type: none"> 1. Advanced Statistics 2. Optimisation Combinatorics 3. Applied Geology 4. Environment Protection 5. Methods for Soil Improvement 6. Concrete in road construction 7. Urban Traffic 8. Perspective
Number of student places	20 students
Person in charge of the academic programme	Prof.asoc.dr. Naser Kabashi,
Scientific/artistic staff (number per staff category)	12 lecturers and 8 Assistants
Tuition fees	According to UP fees 250 Euro per semester.

Goal and profile of Study Program: Road Infrastructure – Master Level

- To expand the research knowledge in the field of road infrastructure
- To provide for the Kosovo market and further, personnel who may be in the role of leadership in technical solutions in the road infrastructure and construction engineering practices.
- To provide the solution of current engineering problems in the road infrastructure construction
- To provide knowledge for the continuation of studies or scientific research to PhD level.

Learning Outcomes

- To recognize the orientation of the road infrastructure towards the advancement and application of new methods and materials.
- To apply theoretical Know how in practical and experimental part of the road construction.
- To understand how to solve complex problems with scientific basis and provide appropriate solutions.
- To know with own knowledge to support improval of the construction requirements in accordance with the Standard.

Study Program relation with leading principles of Institution

Road Infrastructure Study Program provides an important chain of study in the Department of the construction and is in full accordance with the mission defined for Faculty development, respectively leading principles of the institution.

Study program level

This programme is level 7 of programme according to KKK respectively Master level.

Conditions for admission of students and selection procedures

Selection of candidates will be done according to the following criteria:

Ranking will be done according to the average grade achieved during Bachelor studies therefore;

- Students who have grade averages of ≥ 7.5 is not subject of exam and they would be accepted by ranking number,
- Students with grade average < 7.5 will be the subjects of the exam for the places left up uncompleted from first condition .
- Ranking up to the uncompleted places according to the advertisememnt.

Title of academic degree

Master of Civil Engineering – Study programme ; Road Infrastructure

Exam Regulation

Based on Regulation for Bachelor studies (ref.234 / 1, dated 10.03.2011) and Regulation for Master Studies (ref.1451 / 1, dated 07/02/2010). Relevant extracts of these regulations can be founded in the attachment.

Diploma Supplement

At University of Prishtina still is not under implementation appendixes of diploma

Study form, structure and duration

Studies in the research Master program of the Road Infrastructure are regular studies with permanent presence in lectures and exercises. Subjects are organized in semesters and years, while the minimum duration of studies is 2 years.

International comparability of study program and academic degree

Road infrastructure study program Master Level is 80% comparable with the University of Zagreb - Faculty of Civil Engineering in Zagreb.

PLANI I STUDIMEVE – Study Plan:

First year – First semester					
No.	Subject	hours	ECTS	Obligative	Proffesor
MINI01.	Traffic Noise	2+1	6	O	Prof.asoc.dr.Naser Kabashi
MINI02	Traffic Techniques	2+1	6	O	Prof.dr.Musli Bajraktari
MINI03	Road Design	2+2	6	O	Nga jashte UP
MINI04	Railway Design	2+2	6	O	Mr.sc.Fitim Shala
	Total	14	24		
	Subject	hours	ECTS	Elective	Proffesor
MINI05	Advanced Statistics	2+1	6	E	Prof.dr.Fevzi Berisha
MINI06	Combinatoric Optimization	2+1	6	E	Prof.dr.Abdullah Zejnullahu

First year – second semester					
No.	Subject	hours	ECTS	Obligative	Proffesor
MINII01	Management in road Construction	2+1	3	O	Mr.sc.Illir Rodiqi,ligj
MINII02	Road Construction Layers	2+2	6	O	Nga Jashte UP
MINII03	Bridges	2+2	6	O	Mr.sc.Shaban Perjuci,ligj
MINII04	Road Lower part layers	2+2	6	O	Nga jashte UP
MINII05	Interchanges	2+2	6	O	Nga jashte UP
	totali	19	27		
	Subject	hours	ECTS	Elective	Proffesor
MINII06	Applied Geology	2+0	3	E	Prof.asoc.dr.Islam Fejza
MINII07	Environment Protection	2+0	3	E	Prof.dr.Fetah Halili

Second year – First Semester					
No.	Subject	hours	ECTS	Obligative	Proffesor
MINI I101	Academic writing and scientific research methods	2+0	3	O	Prof.dr.Musa Stavileci
MINI I102	Tunnels	2+2	6	O	Prof.dr.Fikret Ahmedi
MINI I103	Airports	2+1	6	O	Prof.ass.dr.Misin Misini
MINI I104	Traffic markings	2+0	6	O	Prof.asoc.dr.Sedullah Avdiu
MINI I105	Road Junctions Crossroads	3+0	6	O	Nga jashte UP
	totali	14	27		
No.	Subject	hours	ECTS	Elective	Proffesor
MINI I105	Methods for soil improvement	2+1	3	E	Mr.sc.Qani Kadiri
MINI I106	Concrete in the infrastructure	2+1	3	E	Prof.asoc.dr.Naser Kabashi

Second year – Second Semester					
No.	Subject	hours	ECTS	Obligative	Proffesor
MINI V01	Road Maintenance	2+0	6	O	Ministria e Infrastruktures
MINI V02	Diploma work	/	18	O	
	totali	/	24		
No.	Subject	hours	ECTS	Elective	Proffesor
MINI V03	Urban Traffic	2+1	6	E	Nga jashte UP
MINI V04	Persepective	2+2	6	E	/

Obligatory Courses

1. Traffic Noise (2+1)

Introduction: General terms. Traffic Noise: sources of noise, impact on quality of life and work. Regulations on the subject of noise protection: rules and regulations applicable, the European Commission recommendations, the noise cards. Traffic noise measurements: equipment, verification and processing of measurement results. Methods of estimation: the parameters of the impact, extent of noise models. Protective measures against noise: reduction at source, reduction at the emission place, economic measures. Monitoring- Control of measurements. Compulsory Literature: Lakušić, S. Dragčević, V; Rukavina T. UUtjecaj buke od prometa u poslovno-stambenim zonama grada Azgreba. Zagreb: Gradevinski Fakultet, 2004. , Opci tehnicki uvjet za radove na cestama. Zagreb: Hrvatske ceste i Hrvatske autoceste, 2001, Upustva za koristeje softëarskog paketa LIMA™ Environmetnal Noise Calculation and Mapping Softëare Versison 4.4, Denmark, 2004,

2. Traffic Techniques (2+2)

Definition of traffic terms and techniques. Theory of traffic flow. Development of vehicle and traffic flow theory. Definition and measurements of variations in traffic flow based on: traffic, traffic speed and traffic density. Relations between variations in traffic flow under: Liaison spaces and partial reports of variations. Traffic circulation patterns: microscopic and macroscopic models and their liaison reports. The ability of different issue and road services: concept development, definition of elements and their impact. Traffic loads on the road: traffic count, traffic flow in wire processing and receipt of data, connotations cargo traffic on the road. Ability issuing of road and intersections: motorway, multilane carriageways, dual carriageway, different tupes of junctions.

3. Road Design (2+2)

Design rules. Modeling solutions. Space Limitations. Digital terrain models, digital models of solutions. Operations models. Horizontal Alignment. Vertical Alignment. Cross Sections. Stopping side Distance. Sight Distance. Volume calculation method. Sloping plan. Procedures of Design preparation. Cost benefit analysis and determining priorities Compulsory literature : D. Pološki, Ž. Stepan: Ispis predavanja 2003/2004, B. Pribičević, D. merak: Geodezija u gradevinarstvu. Zagreb; V.B.Z. 2003. Geodetski radoni pri projektiranju i trasiranju prometnica.

4. Railway Design and Construction (2+2)

General characteristics of railway . The basis of calculating of the train traction: the train resistance, the attraction force of the locomotive, train mass, the attractive force. Indicators of rail conveyor circulation. The rails circular region, limiting the flow of goods and passengers. Railway Design: Horizontal Alignment / Vertical Alignment , the number of circulation lanes. Design of rails: Design Softwares. Stages of the design: feasibility study, conceptual design, Main Design. Evaluation of selected variants: methods for evaluating of alternatives. Calculation of rail capacity: issuing and circulation of rail capacity. Reconstruction single line rail track: basic definitions of reconstruction. Designing the second rails: ways of building a second rail line, positioning in relation to the objects . High speed Rails: specification, elements of horizontal Alignment / basic elements vertical alignment. Compulsory Literature: Marusic, D. Projektiranje i gradenje željezničkih pruga. Split: Građevinski fakultet.

5. Management in Construction (2+0)

Basic principles of management: what is the management, who are managers. Development of the management, management development, management functions. Working persistence; definition of Determination, the problems and errors in decision making, styles and ways of putting the decision-making methods, methods of forecasting. Project management: definition, project leader, project goals, type of project. The composition of the economy and his circle; basics of organization management, organizational goals, organizational structure, technological aspects, economic and social organization, the impact of district organizational structure, job specifications of the participants in construction. Planning the working process: nature, reason and purpose of management planning process. Leadership in working processes, styles and modes of leadership, leadership, motivation, communication working determination, attitude to work. Control of working processes: financial control of construction project. Compulsory Literature; . Literatura e obligueshme/ Menadžent za inženjere, Mariza Katavic, Sveučilište u Zagrebu, Građevinski Fakultet, Zagreb 2006. Literatura e propozuar: Management for the Construction Industry, Stephen Lavender, Longman and The Chartered Institute of Building, Esex, England 1996.

6. Road construction (2+2)

Introduction and general terms. Historical Review of road construction. Contemporary road construction components (asphalt paved roads, concrete paved roads). Components that affect the design, building and maintaining the road construction. Sub-base (Sub-base of natural materials, sub-base by stabilizing materials). Supporting layers (sub base from granular material , cement stabilised sub base , bituminous sub base). Road asphalt layers (bituminous subbase , emulsions, asphalt concrete wearing courses, concrete wearing courses splitmastikasphalt). Design of new road construction (road design construction with asphalt and concrete). Design of reconstruction and strengthening of road construction. Compulsory literature: Literatura e obligueshme: Babic, B. Projektiranje kolnicikih konstrukcija. 1997. Horvat, Z. Gradenje i održavanje kolnicikih konstrukcija.1985. Roberts, F., i drugi: Vruce asfalte mjesavine. 1996. / Literatura e propozuar: Opci tehnicki ubjeti za radove na cestama. 2001.

7. Road Lower part layers (2+2)

Introduction: general construction of the lower road layers. Preparation works: Data collection for terrain and soil, classification of materials for the earth works. Cross profiles: normal and characteristic. Road Embankment: design and construction of cut and fill works. Objects in the in the road emankment: retaining wall. Road drainages. Calculation and ordering of the earth masses. Work execution in inappropriate terrain landslide, basements with poor soil conditions. Works in the rock conditions. Compulsory Literature: Dragcevic, V.; Korlaet, Z. Osnove projektiranje cesta. Zagreb: Građevinskih fakultet Sveucilista u Zagrebu, 2003. Opci tehnicki uvjet za radove na cestama. Zagreb: Hrvatske ceste i Hrvatske autoveste, 2001.; Dragcevic, V., Rukavina T. Donji ustroj prometnica. Zagreb: Gredevinski fakultet Sveucilista u Zagrebu, 2006.

8. Road Junctions – Cross roads (2+2)

Traffic flow at the crossroads, directions of traffic flow, chanalizing of traffic flow . The criterion for the selection of junction, circulating construction. Types of junctions. Geometry of car path at the curves . Types of vehicles, trajectory of movement and methods. Directions (lines) at junctions: form of directions aceleration and deacleration lines Resting spots, type, function and form. Slip roads connecting at the intersections in the separate graded junctions . At the level junctions, ranking, design. Separate graded junctions ranking, design. Interchanges: ranking design . Combined Intersections: ranking design. Compulsory Literature: Klemencic, A. Oblikovanje cestovnih cvrista izvan razine, monografija. Zagreb : Građevinski institut, 1982. str.

109. Korlaet, Z. Cvorista, skripta. Zagreb: Građevinski fakultet, 2004., str. 69. Richtlinien für die Anlage von Straßen, Plangleiche Knotenpunkte, RAS-K-1, FGSV, Bonn, 1988., str. 120.

9. Tunnels (2+2)

Entities of the tunnels. The meaning of constructing tunnels examples of international and local tunnels. The parameters and values for designing of tunnels, road tunnels, rail tunnels and underground tunnels (subway). Methods of RMR rock mass classification, composition Q, NATM. Excavation methods and construction of the rocky mass of links, classic methods, modern methods. Adecco-RS method, mining, deformation and mining safety. Constructions portals (entry). Safety in tunnels, infrastructure measures, security equipment, measures for users. Compulsory Literature: Mikulic, J; Stipetic, A; *Zeljeznicke pruzne gradevine*, IGH, Zagreb. 1999. (Tuneli str. 150-197. posebno str. 174-187.); Banjad, I; *Tuneli*, GF, Zagreb, 1986; (Metode izvedbe tunela str. 163-194); Marusic, D.: *Projektiranje i gradnje zeljeznickih pruga*, GF Sveucilista u Splitu, 1994. (posebno- Usponi u tunelu str. 135-137.) <http://www.rocksoil.com/ingindex3.html>; Lunardi P., 2000. *Design & constructing tunnels – ADECO-RS approach*, T&T International special supplement, May 2000.

10. Airports (2+1)

Introduction. History of flights. Civil air traffic. Organization and rules. Basis for meteorological research needs, the deployment and use of the airport. Composition of air traffic, air ports and elements, separation, classification and definition of the airport. Surfaces of airports-definition and characteristics, manoeuvres areas of airports. Marking the airport and airport area. Obstacles and obstacles. Building passengers. Cargo building. Classification of surfaces of conveyors for movement of aircraft (loading, classification by different methods). The dimension of the movement line of the aircraft (asphalt concrete surface). The dimension of the movement line of the aircraft (asphalt concrete surface). Compulsory Literature: Horvat Z. *Aerodromi I*. 1982.; Prager A. *Aerodromi I – izmjene i dopune*. 1990.; Rugavina T. *Biljeske za predavanja* 2004. /

11. Road Marking and signalisation (2+1)

General Terms and definitions. Equipment and road traffic safety. Vertical signalisation: traffic signs, risk, information, strict orders and performing various signs. Horizontal signs: longitudinal, transverse and other markings on the road. The marking during the construction. Equipment for marking the road edges: guiding poles, other signs. Road barriers: steel, concrete, and wire barriers. Construction of noise protection: walls, different noise protectors. Other road ancillaries: automatic counters of traffic, meteorological station on the road, telephone cabins, protection from snow, wind protection. Compulsory Literature: *Opci tehnicki uvjeti za radove na cestama*. Zagreb: Hrvatske ceste i Hrvatske autoceste, 2001. Benz Kotzen, Colin English, *Environmental noise Barriers*, London, 1999.god.

12. Traffic Engineering(2+1)

Movement : historical development, definition and separation. Vehicles, roads and journeys, important issues. Drivers and pedestrians. Physical and psychological importance. General importance of movement, speed, distribution, traffic loads. Urban travel, signs of cities, the generator of travel, CBD. Public circulation in public circulation in cities and regions, the role in the development of the city, type, capacity, productivity, success, ecological and civic aspect. Pre transition as the definition and characteristics, and pretransition integration of conventional transit.

pre transition role in various space, civic aspects. Pedestrian circulation, general pedestrian stage

planning and design of pedestrian facilities. Flow of bicycles, general, stage and bicycle planning and design of the bicycle stage, providing circulation, processing of disaster, disaster analysis, and the study of disasters, the composition of the assessment, the increase in activity. Studies of traffic, types of data, elements of the study, traffic loads, speed, travel time and losses, circulation stage, parkings. Flow projections, the overall approach methodology, the definition of the problem, making statistical basis of the documentation, forecasting socio-economic development and transport demand, training and assessment plan

Compulsory Literature McShane, E. R. i Roess, R. P.: Traffic Engineering, Prentice-Hall, Inc. Englewood Cliffs, New Jersey, 1990.; Paden J.: Metode prostorno-prometnog planiranja, informator, Zagreb, 1978.; Korte, J. V.: Osnove projektiranja gradskog i medugradskog putnog saobraćaja, Građevinska knjiga, Beograd, 1968.; Pignataro, L. J.: Traffic Engineering, Theory and Practice, Prentice-Hall, Inc. Englewood Cliffs, New Jersey 1973. /

13. Road Maintenance (2+0)

Introduction. fundamental basics of road management. Maintenance of roads (definition, purpose and economy). Evaluation of road condition (types of damages, method of data collection for roads, road condition assessment based on data collection. Maintenance of roads with from asphalt concrete. Maintenance of concrete roads. Refurbishment of asphalt road construction (with improvement, with full replacement of full road construction, combination of strengthening and full replacement). Reconstruction of a concrete road. holes and other deformations/ improvements occurred during the working in the infrastructure of municipalities. structures composition and elements of the road network maintenance management. Managing with road models (HDM III, the system dTIMS / VIAPMS).

Compulsory Literature: Literatura e obligueshme: Srsen, M.: Održavanje cesta, Građevni godisnjak, HSGI, Zagreb, 2000.; Dragcevic V., Korlaet Z., Rukavina T., Biljeske za predavanja. /

14. Academic writing and scientific research methods (2+0)

Collection, study and systematization of information. Meaning, types and verification of hypotheses. Meaning, scope and elements characteristic of the seminar notes. Data collection. Analysis of the data. Methods of research work. Modelling methods .Statistical method. Mathematical methods. Experimental methods. Communications Theory as method. The case study method. Visual methods. Method of survey and interviews.

Compulsory Literature: Literatura Baze: Zelenika R. Methodology and technology prepared the research work, Rijeka 1999; Literatura e rekomanduar: Fellows, R.; Liu, A. Research Methods for Constructions, Oxford: The Blackwell Science, 1997; Holt, D.G.: A guide to successful dissertation study for students of the built environment.

Elective Courses

1. Stochastic Processes (2+2)

Stochastic Processes. Random processes and random function. Defining of stochastic process. The distribution function of n order of the stochastic process. Suspection, disperzion, and the correlation function. Stochastic process with stationary independent growth. Markovljevi processes . Homogeneous processes of Markovljevi condition with discrete communities. Finite matrix . Matrix of range projections . Compulsory Literature: Z.Pause. Vjerojatnost informacija. Zagreb 1988, 2003; W.Bryc: Applied probability and Stochastic Processes, 1995

2. Optimisation Combinatorics (2+2)

Basic knowledge of differential and integral calculations, based on computer science, and communications systems. Compulsory Literature: R.Wilson in J. Walkins: Uvod v teorizo grafov, DMFA Slovenija , E.Kreyszig, Advanced Engineering Mathematics, J.Wiley and Sons
E.Zakrajsek: Matematično modeliranje , DMFA Slovenija

3. Advanced Statistics (2+2)

Advanced statistical tests. Logistics and distribution according to probability. Logit and Probit curves and theoretical modeling of discrete bases. Queuing theory. Tools for programming in the application of advanced statistics. The project, course level, based on some statistical applications in some traffic engineering problems. Compulsory Literature: Literatura baze: E.Kreyszig, Advanced Engineering Mathematics, J.Wiley and Sons M.Hladnik: Verjetnost in statistika; R.Langley: Practical Statistics

4. Applied Geology (2+0)

General knowledge on geology. Mineralogy, research methods, physical and chemical properties of minerals, crystallography, systematisation of minerals. Petrology, magmatic, sedimentary and metamorphic rocks. Structures and textures of rocks. Hydrogeology, the presence of water in soils, groundwater types, and penetration porosity of rocks. Engineering geology, basic classifications, landslides, quarries, tunnels. Compulsory Literature: Literatura baze: Herek, M. Geologija, 1990; Sestanovic. S. Osnove geologije i petrologije, 2001 T. West: Geology applied to Engineering, 1994; Monroe, J. & Wicander, R. Physical Geology, 2004.

5. Environment Protection (2+0)

Introduction. Fundamental understanding of ecology. Ecology. Ecosystems. Biological variability. Changes in the biosphere. Changes in the atmosphere. Pedosphere pollution. Pollution of the hydrosphere. Pollution with energy release. Biodiversity reduction. The impact of construction on the environment. The impact of cities. The impact of waste. The impact from streets. The impact from hydrotechnical objects . Measures and environmental protection actions. Political and sociological approach. Law measures. Planning and organization of space. Access to scientific and technological measures. Institutional measures. Compulsory Literature: Vukovic. Z: Odum, P. : Fundamentals of Ecology, W.B.S.C, 1971; Gondie, A: The human Impact of the Naturel Enviromental, 1990

6. Soil Improvement methods (2+1)

Introduction: scope, definition, scope of application, the application of stabilization to the roads. Meaning and types of unstable soils. The choice of methodology (initial parameters influencing the methodology). Principles of mechanical stabilization. Stabilization of soils with cement.

Stabilization with lime.Stabilisation with fly ash.Stabilization with bitumen. Thermal stabilization processes. Stabilization of soils with low bearing capacity with geosynthetics. Compulsory Literature: Babic B, Horvat Z.: Gradjenje i održavanje kolničkih konstrukcija; Babic B.: Geosintetici u prometnicima, Zagreb 1995

7.Concrete in road Construction (2+1)

Concrete elements on roads and airports. Roads from concrete, asphalt roads. Calculation of temperatures flow in concrete and evaluation of cracks .Dilatations/joints in the roads.Surface finishes. Micro reinforced Concretes. High performance concrete. Concrete from modified polymers. Flow concrete. Concrete in the tunnels. Injections. Tunnel restoration. Technology of concrete production for roads. Vacuum concrete. Exercises: technical requirements for concrete used for buildings and roads. Principles and norms for quality control of concrete for roads. Examination of fresh and solid concrete. Design mix of the concrete. Compulsory Literature: Ukrainczyk V. Beton-struktura,svojstva, tehnologija.Zagreb 1994. Beslac J. Materiali u Arhitekturi i gradjevinarstvu, Zagreb 1988