

REPORT ON MODERNISATION OF UNIVERSITY COURSES IN COLLABORATION WITH THE INDUSTRY SECTOR

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Curricula innovation in climate-smart urban development based on green and energy efficiency with the non-academic sector

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Content

Exe	cutive Summary
List	of abbreviation
List	of Tables 2
List	of Figures
1.	Introduction
2.	Methodology7
2.1	Courses from WB Universities to be modernized7
2.2	Action Plan: Steps in the process of courses modernization10
	2.2.1 Definition of Local Working groups and Courses to be modernized confirmation:
	2.2.2 Teaching Guide Template Proposal & Submission of courses to modernize according to Template Format:
	2.2.3 Courses' key aspects to modernize: Teaching Staff & Non-academic partners
	2.2.4 Courses to modernize classification according to CSUD categories
	2.2.5 Courses to modernize allocation to SmartWB's EU and Third Countries associated to the Programme partners:
	2.2.6 Modernized Course Benchmark: Water Protection I
	2.2.7 Courses to Modernize First Draft's Collaborative Development
	2.2.8 Courses to Modernize Second Draft's Collaborative Development
	2.2.9 Courses to Modernize Definite Version Submission
	2.2.10 Report D3.1 Writing:
	2.2.11 Report D3.1 Review & Feedback:
	2.2.12 Complementary Activities:
3.	Courses modernized
3.1	University of Montenegro
	3.1.1 Building Materials
	3.1.2 Communal Infrastructure
	3.1.3 Elements of building
	3.1.4 Hydrotechnical Meliorations
	3.1.5 Introduction to Civil Engineering

3.: sa	1.6 Maintaining, Retrofitting and Strengthening of structures (formerly, Maintaining, Initation and reconstruction of buildings)	49
3.1	1.7 Urban Planning Basics	51
3.2 Uni	iversity of Sarajevo	53
3.2	2.1 Environmental Protection	54
3.2	2.2 Urban Roads	56
3.2	2.3 Water Protection I	58
3.3 Uni	iversity of Mostar	60
3.3	3.1 Durability, resilience and maintenance of structures	60
3.3	3.2 Materials for energy efficient and sustainable buildings	62
3.3	3.3 Special types of concrete	63
3.3	3.4 Sustainable Buildings from natural materials	65
3.4 Uni	iversity of Bihac	67
3.4	4.1 Building Materials	67
3.4	4.2 Energy Efficiency	70
3.4	4.3 Spatial Planning	72
3.5 Eur	ropean University of Tirana UET	75
3.5	5.1 Architectural Technology	75
3.5	5.2 Construction Sciences	77
3.5	5.3 Urban Design I	79
3.6 Poly	ytechnic University of Tirana UPT	82
3.6	6.1 General Geodesy 1	83
3.6	6.2 General Geodesy 2	85
3.6	6.3 Knowledge of urban planning and projects	87
3.6	6.4 Topographic surveys and State Geodetic networks 1	89
3.6	6.5 Topographic surveys and State Geodetic networks 2	91
3.7 Poli	is University	93
3.7	7.1 Geographic Informational Systems	94
3.3	7.2 Local Governance	97
3.7	7.3 Urban Economics	99
3.7	7.4 Urban Planning	102
4. Su	ummary on modernization of university courses in collaboration with the industry sector	105
4.1 Uni	iversity of Montenegro (UoM)	105
4.2 Uni	iversity of Sarajevo (UNSA)	106

smårt**WB**

Report on modernisation of university courses in collaboration with industry sector

5. Conclusion	109
4.7 Polis University (UPOLIS)	109
4.6 Polytechnic University of Tirana (UPT)1	108
4.5 European University of Tirana (UET)1	L07
4.4 University of Bihac (UNBI)	L07
4.3 University of Mostar (UNMO) 1	106

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Executive Summary

This document represents D3.1 "Report on modernised university courses" of the SmartWB project funded by the European Commission's Erasmus+ Programme ERASMUS-EDU-2022-CBHE under grant agreement No 101081724.

In this report, the scope and content of modernization of university courses in the curricula of Western Balkan's (WB) Higher Education Institutions (HEIs) in the field of Urban Development based on green and energy efficiency climate-smart urban development will be presented. All the courses have been modernized based on careful research of the labor market and industry sector needs in each one of the WB's countries involved in the project – Albania, Bosnia-Herzegovina, and Montenegro –, their national strategies, as well as through a connection of learning outcomes with curricula and assessment methods in line with the principles of European Union's (EU) Bologna Declaration. In addition to that, the modernization has been also based on an interdisciplinary approach in which the different agents involved in the project – SmartWB's partners and participants – from diverse disciplines – Civil Engineers, Hydrologist, Landscape Architects, Economists – have been actively involved.

The report is organized in five sections. To begin with, it introduces its content and scope. After that, the report describes in detail the methodology and steps that have been followed to develop it. In the third section, it includes the detail of the modernization of all the courses containing the following elements for each course: course and teacher identifiers, course objectives & goals and learning outcomes, teaching materials required and recommended, teaching strategies, techniques, and methods, and, lastly, student performance assessments, evaluation criteria and grading. Finally, the report ended with a descriptive analysis of the modernization process as well as some conclusions which could be extracted from it.



List of abbreviation

ACE BH	The Association of Consulting Engineers of Bosnia and Herzegovina
BOKU	University of Natural Resources and Life Sciences Vienna
CO-PLAN	Institute for Habitat Development
CSUD	Climate Smart Urban Development
EU	European Union
HE	Higher Education
HEI	Higher Education Institution
ICT	Information and Communication Technologies
NMBU	Norwegian University of Life Sciences
MS	Project's Milestone
SC	Smart City
OZON	Ecologist Non-Government Organization at Montenegro
PMC	Project Management Committee
QAC	Quality Assurance Committee
SO	Specific Objectives
TG	Target Groups
UET	European University of Tirana
UNBI	University of Bihac
UoM	University of Montenegro
UNI	University of Nis
UNIZG	University of Zagreb
UNMO	University of Mostar
UNSA	University of Sarajevo
URJC	Universidad Rey Juan Carlos
U_POLIS	POLIS University
UPT	Polytechnic University of Tirana
THOWL	Technische Hochschule Ostwestfalen-Lippe
WB	Western Balkan



List of Tables

Table 1 - List of Planned Courses according to Project Proposal 8
Table 2 - Definite List of courses to modernize numbered and with updated courses' denomination . 9
Table 3 - UoM and OZON's aspects to modernize for UoM's courses 14
Table 4 - UNSA and ACE-BH's aspects to modernize for UNSA's courses 17
Table 5 - UET and COPLAN's aspects to modernize for UET's courses
Table 6 - Categorization of Course to modernize according to the groups defined on Report D.2.3 23
Table 7 - Detail of EU and Third Countries associated to the Programme partners' assignment of courses to modernize 25
Table 8 - Steps followed for the proposal of modernized courses 37
Table 9 - Proposal of courses to modernize University of Montenegro 38
Table 10 - Proposal of courses to modernize University of Sarajevo
Table 11 - Proposal of courses to modernize University of Mostar
Table 12 - Proposal of courses to modernize University of Bihac
Table 13 - Proposal of Courses to modernize European University of Tirana 75
Table 14 - Proposal of courses to modernize Polytechnic University of Tirana
Table 15 - Proposal of courses to modernize Polis University 94
Table 16 - Summary of the modernization process for UoM's courses 105
Table 17 - Summary of the modernization process for UNSA's courses 106
Table 18 - Summary of the modernization process for UNMO's courses 107
Table 19 - Summary of the modernization process for UNBI's courses 107
Table 20 - Summary of the modernization process for UET's courses
Table 21 - Summary of the modernization process for UPT's courses 108
Table 22 - Summary of the modernization process for UPOLIS' courses



List of Figures

Figure 1 - Standardized Template for Courses to Modernize	. 12
Figure 2 - Smart WB's Moodle Platform	. 13
Figure 3 - Benchmark & Pilot Course: University of Sarajevo's Water Protection I Course	. 27
Figure 4 - Example of the actions taken to modernize Polis University's Local Governance course	. 33
Figure 5 - SmartWB Platform: Course to Modernize First Draft Folder	. 34
Figure 6 - SmartWB Moodle Platform: Courses to modernize Final Version Folder	. 35
Figure 7 - Task 3.1 Gantt Diagram (September 2023 - April 2024)	. 36

1. Introduction

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Students in urban development require modern and up-to-date courses and materials in the field which will provide them the necessary knowledge and skills resulting in faster and more convenient employability in this business sector. One of the main trends in the field in recent years has been the adoption of a "smarter" and "more sustainable" approach to tackle the increasing challenges related to Climate Change. This report presents twenty-nine modernized University Courses at bachelor's and master's Degrees of seven Higher Education Institutions (HEIs) from region 1 – Albania, Bosnia and Herzegovina and Montenegro – in the climate-smart urban development field in collaboration with the industry sector and aligned with EU trends and Bologna requirements. The courses' modernization proposal is aligned with the objectives of the Europe 2020 strategy oriented to tackle global challenges such as climate change in an effective and efficient way and the initiatives on Rethinking Education in general and the approach adopted by the European Union for modernizing Europe's Higher Education Systems. The expected impact of this action is not only transferring updated knowledge, capacities and skills in climate smart urban development but also increasing awareness of its relevance and promoting economic and social value by creating better living and working conditions for next generations in Western Balkan's countries.

This report has been the result of the involvement and close collaborative work and effort of three agents that are part of the major Target Groups (TG) involved in the project – Teaching Staff (TG2), Representatives of business sector companies in the field of urban development (TG3) and Professionals in the field of urban development and related disciplines (TG4) –. First, WB's HEIs Teaching and Academic Staff from seven universities – University of Montenegro UoM (Montenegro), University of Sarajevo UNSA, University of Bihac UNBI and Dzemal Bijedic University of Mostar UNMO (Bosnia and Herzegovina) and Polytechnic University of Tirana UPT, European University of Tirana UET and Polis University UPOLIS (Albania). Second, three non-academic partners that represent Professionals in the field of Urban Development and are directly related to companies in the business sector from the WB Region with experience in cooperation with the academic sector and expertise in the field - CO-PLAN (Albania), OZON (Montenegro) and ACE-BH (Bosnia and Herzegovina) –. Third, Teaching and academic staff from seven HEIs from EU Member States and Third countries associated to the Programme – University of Natural Resources and Life Sciences Vienna BOKU (Austria), Norwegian University URJC (Spain), Technische Hochschule Ostwestfalen-Lippe THOWL (Germany) and University of Nis UNI (Serbia).

The project "Curricula innovation in climate-smart urban development based on green and energy efficiency with the non-academic sector (SmartWB)" highlights in its title the importance of modernizing the curricula of WB's HEIs in the field of urban development. According to Project's proposal and scope this modernization process is focused on integrating three key aspects: Business – Academia cooperation, Support & Guidance from EU academic partners and, finally, Dynamization and Update of teaching techniques particularly in the practical part of the courses. Firstly, the project emphasizes the importance of building and developing the courses based on business-academia cooperation designed in a manner to be continuously upgradeable by contributions from companies and non-academic partners. Secondly, the project highlights the relevance of aligning the courses of WB's HEIs with the more advanced and stable courses that define the curricula of EU member States and Third Countries associated to the Programme. Finally, it is significant for the modernization process



including innovative and advanced Teaching Techniques, methodologies and up-to-date solutions based on Information and Communication Technologies (ICT) in their courses and particularly in the practical part of their classes.

According to academic literature climate change has a special and significant long-term effect and impact on urban development. Introducing "Smart" and "Sustainable" approaches in this area is a strategic decision for any country and particularly for those that are on a developing stage. One of the first steps towards the creation of an environment for Climate-Smart Urban Development (CSUD) is introducing education and training that will raise awareness, provide adequate knowledge and skills and profile new professionals who will incorporate a specific climate-smart urban development approach in all aspects of their professional activity. In this way, climate change demands innovative and up to date courses at universities so that modern approaches, best practices and new technologies and methodologies can be learnt before working in the offering of creative solutions to improve the CSUD and in building Smarter Cities (SC). The European Union (EU) and other development of CSUD by devoting resources through different key agents – Government, Public Entities, private business and universities – that has been translated into a body of knowledge that can be taught to students who will be future professionals in this area.

In line with this EU's approach, SmartWB's project is clearly oriented and focused on improving the quality of higher education (HE) all over Western Balkan (WB) countries by modernizing university courses to adapt them to the new CSUD challenges and opportunities. It recognizes the need to put into action academic reforms by, on one side, considering urban development requirements according to European Green Deal main statements related to aspects such as energy efficiency, urban mobility, urban water management and, on the other side, including the sense of national professionals, companies, and industry partners.

In this report, developed after concluding all the activities and tasks included on project's Work Package 2 (WP2) that comprises analyzing WB regional issues related to urban development – Report on WB Regional Issues related to Urban Development (D2.1) –, considering EU initiatives and polices oriented to urban development and climate change – Report on EU initiatives and policies related to urban development and climate change (D2.2) –, analyzing existing curricula related to climate-smart urban development in EU member states and third countries not or associated to the Programme – Report on existing curricula related to CSUD in EU Member States and third countries not associated to the Programme (D2.3) –, and understanding climate friendly and innovative solutions – Report on climate friendly and innovative solutions (D2.4) –, a proposal for modernizing WB University courses is provided.

It is important to highlight that the Report on existing curricula related to CSUD in EU Member States and Third Countries not associated to the Programme (D2.3) has been especially useful for the development of this task. The report analyzed the existing curricula in CSUD in all SmartWB HEIs and provided a comparative analysis that has significantly helped all partners involved in the project to find ways to improve and modernize the existing courses according to the content and trends that have been identified in the EU and Third Countries not associated to the Programme curricula.

To sum up, Region 1 Western Balkan (WB) Higher Education Institutions are taking Europe as a reference to be inspired when modernizing their university courses regarding CSUD. The steps and



measures taken by EU countries and their universities towards climate neutrality, sustainability, and digitalization for several years become a key source for this modernization. In addition to that, they consider very relevant to include the point of view, opinions, and critical perspectives from non-academic partners – industry, business, and professionals in their own countries. Both agents – academia and business professionals in the area – agreed in considering very relevant the training and education of professional experts in this strategic field and the adoption of skills and capabilities which students could acquire from taking this universities' modernized courses. WB's HEIs academic staff is completely aware of their high responsibility and the role they play in provide knowledge, skills, capacities, and competences in the field of CSUD through these set of modernized courses. Aligned with the aim of completing this task successfully and deliver to all projects' target groups, the Smart WB's project contemplates not only to create the modernized courses but also the use of qualitative indicators to measure the interest in the new modernized courses once implemented through all involved participants' feedback.

The aim of this report is to address Smart WB project specific objective: "To modernize university courses in climate-smart urban development field in collaboration with the industry sector and in line with Bologna requirements". The report presents the detail of the twenty-nine modernized courses that will be part of Western Balkan HEI's curricula and taught to actual students – future professionals – in the coming years.

Contributing: All project partners

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2. Methodology

This section describes in detail the methodology that has been followed to develop this report. The different subsections presented below track all the steps that were taken along the duration of Project's Task 3.1 Modernization of University Courses in collaboration with the industry sector (M1, January 2023 - M16, April 2024) oriented to achieve the final outcome.

2.1 Courses from WB Universities to be modernized

Among SmartWB project specific objectives (SOs), SO4 states literally in project's proposal: "To modernize university courses in climate-smart urban development field in collaboration with the industry sector and in line with Bologna requirements".

As a joint effort of representatives from the industrial sector and WB academic partners in cooperation and under supervision of the EU Member States and Third countries associated to the Programme's HEIs, the courses have been modernized and redesigned acknowledging EU Directives and Standards such as Europe 2020, ET 2020, The Bologna Declaration, Framework for Qualifications of the European Higher Education Area. In addition to that, it is important to mention that it was expected according to Project's proposal that the modernized courses included technologically advanced teaching methodologies and activities based on the problem-based approach particularly for the practical part of the courses.

Consequently, the final objective of this action is to improve the level of awareness, competences, skills, and employability potential of students in HEIs in the third countries not associated to the Programme by developing new and innovative university courses directly related with Climate Smart Urban Development which are going to be part of Western Balkan's HEIs curricula.

The proposal for the modernization of Western Balkan's HEIs courses has been built through the combination of a set of elements which are presented and explained below:

- An advanced approach to courses' reform using interdisciplinary communication, analyzing the society and companies needs and problems, mobilizing university resources and capacity for their solving, creating new education topics in WB's partners HEIs in cooperation with the industry sector represented by the three Western Balkan's non-academic partners – CO-Plan (Albania), ACE-BH (Bosnia and Herzegovina) and OZON (Montenegro).
- The introduction and presentation of innovative methodologies particularly in the practical part of the courses which have been taught, learnt, and practiced along the organized SmartWB's theme-based trainings of teaching staff for acquiring new practical skills and workshops that have been developed during the first year of the project (M1, January 2023 – M12, December 2023):
 - o Dubrovnik (M5, May 2023)
 - o Vienna (M5-M6, May June 2023)
 - o Nis (M6, June 2023)
 - o As (M8, August 2023)
 - o Madrid (M12, December 2023)



- The promotion of excellence in the use of Information and Communication Technology (ICT) in Higher Education, the adoption of advanced and innovative teaching methodologies as well as the inclusion of the use the most advanced laboratory equipment & software to be applied in the practical parts of the modernized courses.
- An update of the graduated students' competencies, capabilities and applicable advanced knowledge in urban development harmonizing current competences in EU Member States and Third countries associated to the Programme HEIs and Third countries not associated to the Programme HEIs.

As a result, the modernized courses are going to be taught using contemporary and modern teaching methods and with an effective use of ICT Tools. The list of 27 planned courses was included in Project's Proposal and are presented in the Table below containing the number of credits according to the European Credit Transfer System (ECTS), the level of study of the course (Bachelor or Master), the maximum percentage of modernization expected for the course (10 – 20%) as well as the expected number of students to be accepted in the first year that the course will be taught (Table 1):

No/Partner	Course name (ECTS)	Level of study	% of the modernized courses compared to content included in the course	Number of students to be accepted in the first year
	Communal Infrastructure (3)	Bachelor (240 ECTS)	< 10%	50
	Introduction to Civil Engineering (3)	Bachelor (240 ECTS)	< 10%	100
	Building materials (7)	Bachelor (240 ECTS)	< 10%	100
	Elements of buildings (6)	Bachelor (240 ECTS)	< 10%	100
	Urban planning basics (5)	Master (120 ECTS)	< 10%	5
1/UoM	Maintaining, Sanitation and Reconstruction of Buildings (5)	Master (120 ECTS)	< 10%	15
	Environmental Protection (6)	Master (120 ECTS)	< 10%	10
	Groundwater Hydrodynamics (6)	Master (120 ECTS)	< 10%	10
8/UNSA	Urban Roads (5)	Master (120 ECTS)	< 10%	20
	Materials for energy efficient and sustainable buildings (5)	Master (120 ECTS)	< 20%	10
	Durability (resilience) and maintenance of structures (6)	Master (120 ECTS)	< 20%	10
	Construction Optimization (5)	Master (120 ECTS)	< 20%	10
9/UNMO	Special types of concrete (5)	Master (120 ECTS)	< 20%	10
	Spatial planning (5)	Bachelor (240 ECTS)	< 20%	20
10/UNBI	Energy efficiency of Buildings (5)	Master (120 ECTS)	< 20%	10
11/UET	Construction Sciences (6)	Bachelor (180 ECTS)/ Master - Integrated Diploma - (300 ECTS)	< 10%	25

Table 1 - List of Planned Courses according to Project Proposal



		Master (120 ECTS) / Master - Integrated		
	Urban Design (5)	Diploma - (300 ECTS)	< 10%	25
	Architecture Technology (6)	Master - Integrated Diploma - (300 ECTS)	< 10%	25
	General Geodesy 1 (6)	Bachelor (180 ECTS)	< 20%	45
	General Geodesy 2 (7.5)	Bachelor (180 ECTS)	< 20%	45
	Topographic surveys and State networks 1 (6)	Bachelor (180 ECTS)	< 20%	45
	Topographic surveys and State networks 2 (7.5)	Bachelor (180 ECTS)	< 20%	45
12/UPT	Knowledge of urban planning and projects (4)	Master	< 20%	15
	Urban Economics (3)	Master	< 20%	30
	Local Governance (6)	Master	< 20%	30
	Urban planning studio (6)	Master	< 20%	30
13/U_POLIS	Geographic Informational systems (6)	Master	< 20%	30

It is important to note that after the Kick-off meeting of the project that took place in Podgorica (Montenegro) in February 2023, two additional courses were included in the list of potential courses to modernize, making a total of 29 courses. The added courses were University of Montenegro's "Hydrotechnical Meliorations" and University of Bihac's "Building Materials" (both have been included in red in Table 2). In addition to that, some of the courses changed slightly their denomination according to the demand of WB's HEIs (these courses have been included in red too in Table 2 with their previous denomination in black). The courses have been organized in alphabetical order for each University and, a number for each one of the courses to modernize has been assigned to facilitate its management in the SmartWB Moodle Platform (Table 2).

No/Partner	Cou	rse name (ECTS)	Level of study	% of the modernized courses compared to content included in the course	Number of students to be accepted in the first year
	01.	Building materials (7)	Bachelor (240 ECTS)	< 10%	100
	02.	Communal Infrastructure (3)	Bachelor (240 ECTS)	< 10%	50
	03.	Elements of buildings (6)	Bachelor (240 ECTS)	< 10%	100
	04.	Hydrotechnical Meliorations	Master (120 ECTS)	< 10%	8
	05.	Introduction to Civil Engineering (3)	Bachelor (240 ECTS)	< 10%	100
	06.	Maintaining, Sanitation and Reconstruction of Buildings (5)	Master (120 ECTS)	< 10%	15
1/UoM	07.	Urban planning basics (5)	Master (120 ECTS)	< 10%	5
	01.	Environmental Protection (6)	Master (120 ECTS)	< 10%	10
8/UNSA	02.	Urban Roads (5)	Master (120 ECTS)	< 10%	20

Table 2 -	Definite List of	^f courses to	modernize	numbered	and with	updated	courses'	denomination
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	03.	Water Protection I Groundwater Hydrodynamics	M + (120 ECTS)	. 100/	10
	01.	(b) Durability (resilience) and	Master (120 ECTS)	< 10%	10
		maintenance of structures (6)	Master (120 ECTS)	< 20%	10
	02.	Materials for energy efficient and sustainable buildings (5)	Master (120 ECTS)	< 20%	10
	03.	Special types of concrete (5)	Master (120 ECTS)	< 20%	10
0/110000	04.	Sustainable Buildings from Natural Materials	Master (120 FCTS)	< 20%	10
9/01110		Construction Optimization (5)	Master (120 ECTS)	< 20%	10
	01.	Building materials (5)	Bachelor (240 ECTS)	< 20%	20
	02.	Energy Efficiency Energy efficiency of Buildings (5)	Master (120 ECTS)	< 20%	10
10/UNBI	03.	Spatial planning (5)	Bachelor (240 ECTS)	< 20%	20
	01.	Architecture Technology (6)	Master - Integrated Diploma - (300 ECTS)	< 10%	25
	02.	Construction Sciences (6)	Bachelor (180 ECTS)/ Master - Integrated Diploma - (300 ECTS)	< 10%	25
11/UET	03.	Urban Design I Urban Design (5)	Master (120 ECTS) / Master - Integrated Diploma - (300 ECTS)	< 10%	25
	01.	General Geodesy 1 (6)	Bachelor (180 ECTS)	< 20%	45
	02.	General Geodesy 2 (7.5)	Bachelor (180 ECTS)	< 20%	45
	03.	Knowledge of urban planning and projects (4)	Master	< 20%	15
	04.	Topographic surveys and State Geodetic networks 1 (6)	Bachelor (180 ECTS)	< 20%	45
12/UPT	05.	Topographic surveys and State networks 2 (7.5)	Bachelor (180 ECTS)	< 20%	45
	01.	Geographic Informational systems (6)	Master	< 20%	30
	02.	Local Governance (6)	Master	< 20%	30
	03.	Urban Economics (3)	Master	< 20%	30
13/U_POLIS	04.	Urban Planning Urban planning studio (6)	Master	< 20%	30

2.2 Action Plan: Steps in the process of courses modernization

Based on project's proposal, meetings and discussions with all partners involved and a joint and cooperative work, an Action Plan that comprises the following activities was needed to complete the courses' modernization Task:

- Definition of Local Working Groups in Western Balkan's Universities responsible for modernization of University Courses & Confirmation of courses to be modernized.
- Presentation and approval of Teaching Guides' Template Proposal in accordance with European Higher Education Area principles.
 - o WB's HEIs Courses to Modernize submitted in Teaching Guide Template Format
- Definition of key aspects to modernize for each one of the courses: Input & Insights.



- Teaching Staff directly involved in courses' teaching should include aspects which they are more interested in modernizing.
- Third countries non-academic partners should include aspects which they are more interested in modernizing for the courses taught in their respective countries.
- Allocation of courses to be modernized to EU and Third Countries non associated to the Programme partners according to their fields of expertise and specialization.
- Presentation of First and Second Drafts of the courses to be modernized as a result of a collaborative effort of all partners involved.
- Submission of Final Version of the Modernized Courses.
- Write Report on Modernization of University Courses in collaboration with the industry sector (D3.1).
- Check and Review of D3.1 by Project's Project Management Committee (PMC) and Quality Assurance Committee (QAC).

For the modernization of courses, 10 different steps have been performed from February 8th, 2023 to February 28th, 2024. The detail of the different steps is described in the upcoming sections.

2.2.1 Definition of Local Working groups and Courses to be modernized confirmation:

Step 1, from February 8th to March 10th 2023

Each one of the seven HEIs from the Third countries not associated to the Programme defined the working groups responsible for the modernization of its respective university courses. WB Universities were asked to confirm the final list of courses to be modernized.

The project's kickoff meeting at Podgorica at the end of February 2023 became an opportunity to have face to face conversations with all the partners involved in the project to clarify some key aspects of courses to modernize and outline a basic plan to perform Task 3.1.

2.2.2 Teaching Guide Template Proposal & Submission of courses to modernize according to Template Format:

Step 2. From February 11th to March 8th 2023

The Leading Partner responsible for the development of this task, URJC, proposed a template aligned with Bologna Requirements and European Higher Education Area principles that would be used to modernize the courses. The template was presented as a "draft" open to suggestions and proposals of improvement by EU and Third countries associated to the Programme project's partners.

The standardized Template proposed (Figure 1) included the detail of all the specific requirements that according to SmartWB's project proposal should be included in the Report on Modernization of University Courses:

- Course and teacher identifiers
- Course objectives, goals and learning outcomes
- Course content divided into separated topics
- Required and recommended teaching materials
- Teaching strategies, techniques, and methods
- Student performance assessments and evaluation criteria and grading.



Figure 1 - Standardized Template for Courses to Modernize

Co-funded by the European Union	Smårt WB	WP3 course propr
		PROJECT INFO
	Project title gree Project acronym Sma Project reference number	icula innovation in climate-smart urban development based o n and energy efficiency with the non-academic sector ttWB
	Funding scheme	v smartwb uce ac me
	Coordination institution Project duration 36	
COURSE TEMPLATE ON XXXXXX		OCUMENT CONTROL SHEET
	Work package WPS	Capacity building of WB HEIs
GRADE/MASTER IN XXXXXX	Ref. no and title of activity indu	Modernization of university courses in collaboration with the stry sector
	Title of deliverable D3.1 Lead institution URJ	Report on modernized university courses
	Author(s) Carr	nen de Pablos-Heredero & Miguel Blanco-Callejo
	Document status Drat Document version and date V1 (Dissemination level Pub	t 38/03/2023) ic
This project has been funded by the European Union. Views and opinions expressed <u>are</u> however, those of the author(s) only and do not necessarily reflect those of	VERSIO	IING AND CONTRIBUTION HISTORY
the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.	Vertion	ate Revision description Partner responsible
	v.01 8 th March,	2023 First template URJC
Curricula innovation in climate-smart urban development based on <u>green</u> and energy efficiency with the non-academic sector		
Project: 101081724 — <u>SmartWB</u> — ERASMUS-EDU-2022-CBHE		
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Theoretical Classes	Week 1 to Week 12	Lectures, exposition and	University has Regulations on acar	demic behavior at the University XXXX and uses d
		resolution of research works	(anti-plagiarism, supervision) whice	ch provides a collective assurance that these esse
Practical Classes	Week 13 to Week 25	Practice resolution, cases,	completely developed	
		research		
		discussions/laboratory/simulations	VII Bibliography	
Seminars & exam	Week 26 to Week 30	Seminars and exam	Generic Beferences	
			XXXXXXXXXX	
VII. Assessment methods			*****	
VII.A. Assessment weightin	ng		Specific References	
Continuous ordinary assess	sment:		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXX.
The distribution and charac	teristics of the assessment tests	are those described below. Only in	*****	x
exceptional case and for sp	ecial reasons may the teacher a	dd changes to the Guide. These changes	000000000000000000000000000000000000000	XXXXX
will require the prior consu	Itation with the Subject Head an	d the prior and explicit authorization of	******	XXX
the Degree Program Coordi	inator, who will notify the Vice-F	tector's office in charge of Academic	*****	XXXXXXXXXXXX
Arrains of the modifications	made. In any case, the changes	proposed must consider the		000000000000000000000000000000000000000
communicated at the start	of the course to the students us	e enect, they must be duly	200000000000000000000000000000000000000	000000000000000000000000000000000000000
The combination of activitie	as that are not re-assessable can	not exceed 50% of the subject grade		
and, in general, cannot hav	e a minimum grade (except for t	he case of laboratory or clinical work	IX.Lecturers/Teachers/Professors	5
placements, where duly jus	tified), and tests which exceed 6	i0% of the subject weighting cannot be	Lecturer/teacher/professor's nam	me XXXXXXX
added.			E-mail address	xxxxxxx@xxxx.xxx
Extraordinary assessment:	Students who do not manage to	pass the ordinary assessment, or who	Area	XXXXXX
did not attend, will be subje	ect to completion of an extraord	inary assessment to verify their	Link	20022222200022222200002
acquisition of the skills esta	blished in the guide, only for act	ivities that are re-assessable.		
Description of the tests for	assessment and their weights	MI 111 1007 5.0 1		
a nnai exam that will be tak	from the continuous evaluation	The even will take place in physical		
class Only if the situation a	t the moment does not allow it	the exam will be on line		
VII.B. Assessment of stude	nts with an academic exemptio	n		
Student who wish to opt fo	r this assessment will have to ge	t an academic exemption for the		
subject, which they will hav	e to request from the Dean or D	irector of the Centre which teaches		
their course. An academic e	exemption may be granted when	e the subjects own characteristics allow		
for it.				
Subject with the possibility	of an exemption: Yes			
VII.C. Review of assessmen	it tests			
In accordance with the example	m appeal regulations of the Univ	ersity XXXXX		
vii.uStudents with a disal	unity or special educational nee tudents with a disability or speci	as al educational needs will be		
determined by the Disabler	Students Support Department	in accordance with the regulations		
governing the Disabled Stur	dents Support service, approved	by the University XXXX to guarantee		
equal opportunities, inclusi	ve treatment, universal accessib	ility and a greater guarantee of		
academic success.				
For this purpose, this Depar	rtment will have to issue a curric	ular adaptation report, therefore		
students with disabilities or	special educational needs must	contact the Department to analyze the		
different alternatives toget	her.			
VII.EAcademic behavior, a	academic integrity, and honesty			
The University XXXX_is com	pletely committed to the highes	it standards of academic integrity and		
	ig at the XXXX means you accept	and agree to the academic integrity		
nonesty. Ineretore, studyin	ad in the University's Code of rel	hiss. To monitor this procedure the		
and honesty values describe	ed in the University's Code of Et	hics. To monitor this procedure, the		

Once the template was checked, reviewed, and approved by all SmartWB's EU and Countries Associated to the Programme partners, it was uploaded into the Smart WB Moodle Platform and was distributed to all project partners. URJC asked all WB's HEIs to send their corresponding courses to modernize in the proposed template format.

A folder in the Smart WB Moodle Platform was created with the title "COURSE PROPOSALS FOR COURSES TO MODERNIZE" organized with sub-folders, one for each of the seven Western Balkans' HEIs so that partners were able to submit the courses in the approved Template (Figure 2).







2.2.3 Courses' key aspects to modernize: Teaching Staff & Non-academic partners

Step 3. From March 9th to May 23rd 2023.

In this period, HEIs WB's partners, and particularly the lecturers involved in courses' teaching were asked to provide input and insight about the aspects they were more interested in modernizing for each one of the courses. By March 22nd, 2023, all WB's academic partners had submitted the courses to modernize in the template format as well as highlighted the aspects which the modernization should be focused on.

In addition to that, non-academic partners in each WB country (CO-PLAN, OZON and ACE-BH) were also asked to submit which aspects they consider more relevant to modernize for each individual course by taking into consideration that modernization of courses couldn't affect, depending on the cases, more than 10% to 20% of the previous content of the courses.

The result of this work is shown below for three of the Western Balkan's HEIs involved in the project – University of Montenegro (Montenegro), University of Sarajevo (Bosnia and Herzegovina) and European University of Tirana (Albania) –.

01 - UNIVERSITY OF MONTENEGRO - OZON

University of Montenegro Local Working group suggested that the courses which they are interested in modernizing could be organized in seven topics:

- Sustainable Urban Planning
- Rehabilitation and Strengthening of Existing Buildings
- Building Energy Efficiency
- Sustainable Building Materials, and Environmentally Responsible Materials
- Sustainable Water Management
- Green and Blue Infrastructure
- Circular Economy in Construction

The following table (Table 3) presents the aspects that University of Montenegro Local Working group – Aspects to modernize UoM – and Montenegro's non-academic partner (OZON) were particularly focused on in terms of modernization for each one of the courses to modernize.

Table 3 - UoM and OZON's aspects to modernize for UoM's courses

Course name (ECTS)	Aspects to modernize UoM	Aspects to modernize OZON
01. Building materials (7)	 Sustainable building materials, and environmentally responsible materials In this area, the following aspects are essential: Green construction materials and technologies - the latest advancements in eco-friendly materials and technologies, including recycled content, biodegradable products, low-emission insulation, and other sustainable building materials. Zero waste design and circular economy in construction - strategies for reducing waste and creating a closed-loop system in the construction industry, such as using reclaimed materials and designing for disassembly. 	 Laboratory use, and case studies in practical classes. Add Internships in with solar panels potential with EPCG of Montenegro, as a part of Methodology and academic program. Integrate learning outcomes of the course with specific objectives of the SMART WB project. Organize learning outcomes as per Bloom's taxonomy.
02. Communal Infrastructure (3)	 Green and blue infrastructure Green infrastructure (such as green spaces, parks, and urban forests) as a tool for reducing the negative impacts of urbanization on ecosystems. Examples of green infrastructure include street trees, urban gardens, roofs, and 	 Integrate 3Ps (people, planet, profit), 5 Rs (refuse, reduce, reuse, repurpose, and then recycle), relations between civil engineering and climate change to



		 walls. These features help reduce urban heat islands, improve air quality, provide habitats for wildlife, and create recreational opportunities for communities. Using green infrastructure, such as green roofs and walls, to mitigate the impacts of climate change and improve urban resilience. Blue infrastructure as systems that manage, store, and/or transport water, such as rivers, streams, wetlands, and stormwater management systems. These features can help reduce stormwater runoff and flooding, improve water quality, and enhance biodiversity in urban areas. 	 promote urban resilience, and 17 SDGS. Add in academic program. Importance of communication with the communities in transparent continuous way is crucial for ongoing and the future projects. There is a lack of communication knowledge and abilities with current investors, and they should be educated by civil engineers on this. Add in academic program. Laboratory use, and case studies in practical classes Add Internships in with solar panels potential with EPCG of Montenegro, as a part of Methodology and academic program. Integrate learning outcomes of the course with specific objectives of the SMART WB project. Organize learning outcomes as per Bloom's taxonomy.
03.	Elements of buildings (6)	 Building Energy Efficiency. The following aspect can be reached: Sustainable design principles for green buildings - the core principles of sustainable design in architecture, including energy efficiency and using environmentally responsible materials. Building energy efficiency and passive house design - strategies for reducing energy consumption in buildings, including passive solar design, thermal insulation, high-performance windows and doors, and ventilation systems. Renewable energy systems and net-zero energy buildings - using renewable energy sources, such as solar and wind power, to power buildings and create net-zero facilities that produce as much energy as they consume. 	 Laboratory use, and case studies in practical classes. Add Internships in with solar panels potential with EPCG of Montenegro, as a part of Methodology and academic program. Integrate learning outcomes of the course with specific objectives of the SMART WB project. Organize learning outcomes as per Bloom's taxonomy
04.	Hydrotechnical Meliorations	 Sustainable Water Management In the area of sustainable water management, a particular focus is on sustainable water management in melioration systems: Strategies and technics for sustainable water management in melioration systems. Conservation of water resources, through rainwater harvesting, wastewater recycling, and reducing water usage by adopting efficient irrigation systems. Using efficient irrigation systems such as drip, sprinkler, and subsurface irrigation can help reduce water usage and minimize water loss due to evaporation and runoff. 	 Laboratory use, and case studies in practical classes. Add Internships in with solar panels potential with EPCG of Montenegro, as a part of Methodology and academic program. Integrate learning outcomes of the course with specific objectives of the SMART WB project. Organize learning outcomes as per Bloom's taxonomy.
05	Introduction to Civil	 Circular Economy in Construction Circular economy and Life-Cycle Assessment (LCA) are two approaches to environmental sustainability that can complement each other. In this sense, the following aspects are interesting: Circular economy in construction and zero waste design - strategies for reducing waste and creating a closed-loop system in the construction industry, such as using reclaimed materials and designing for disassembly. The process of assessing the environmental impact of a building over its entire life cycle, including construction, operation, and disposal (Life-Cycle Assessment and Environmental Impact Analysis). Building Energy Efficiency Sustainable design principles for green buildings - the core principles of sustainable design in architecture, including energy efficiency. 	 Integrate 3Ps (people, planet, profit), 5 Rs (refuse, reduce, reuse, repurpose, and then recycle), relations between civil engineering and climate change to promote urban resilience, and 17 SDGS. Add in academic program. Importance of communication with the communities in transparent continuous way is crucial for ongoing and the future projects. There is a lack of communication knowledge and abilities with current investors, and they should be educated by civil engineers on this. Add in academic program. Laboratory use, and case studies in practical classes. Add Internships in with solar panels potential with EPCG of Montenegro, as a part of Methodology and academic
	Engineering (3)	In this area, the following aspects are essential:	program.



		 Green construction materials and technologies - the latest advancements in eco-friendly materials and technologies, Biophilic design and nature-inspired architecture - use natural design elements, such as plants, water features, and natural lighting, to create a more sustainable and enjoyable built environment. 	 Integrate learning outcomes of the course with specific objectives of the SMART WB project. Organize learning outcomes as per Bloom's taxonomy.
06.	Maintaining, Sanitation and Reconstruction of Buildines (5)	 Rehabilitation and strengthening of existing buildings In the area of the rehabilitation and strengthening of existing buildings, the following aspects are interesting: Integrated techniques for the seismic strengthening and energy efficiency of existing buildings. Methodologies for assessing the combined effect of upgrading. Novel technologies for combined seismic and energy upgrading. New innovative materials (e.g. Green Construction Materials, eco-friendly materials, biodegradable products, low-emission insulation, and other sustainable building materials) for rehabilitating and strengthening existing buildings and infrastructures. New materials and technologies for the durability and reliability of existing structures. The increase in durability of existing buildings and infrastructures to improve their sustainability and to ensure prolonged service life. 	 Integrate 3Ps (people, planet, profit), 5 Rs (refuse, reduce, reuse, repurpose, and then recycle), relations between civil engineering and climate change to promote urban resilience, and 17 SDGS. Add in academic program. Importance of communication with the communities in transparent continuous way is crucial for ongoing and the future projects. There is a lack of communication knowledge and abilities with current investors, and they should be educated by civil engineers on this. Add in academic program. Laboratory use, and case studies in practical classes Add Internships in with solar panels potential with EPCG of Montenegro, as a part of Methodology and academic program. Integrate learning outcomes of the course with specific objectives of the SMART WB project. Organize learning outcomes as per Bloom's taxonomy.
07.	Urban planning	 Sustainable urban planning In this area, the following aspects are interesting: Sustainable urban planning and design - design and planning of sustainable cities, including mixed-use developments, transit-oriented design, and green space. Climate resilient urban spaces - techniques for overheating protection and avoiding the urban heat islands occurrence. Sustainable landscaping and permaculture design - techniques for designing sustainable landscapes, including permaculture design, native plants, and water-wise irrigation. 	 Integrate 3Ps (people, planet, profit), 5 Rs (refuse, reduce, reuse, repurpose, and then recycle), relations between civil engineering and climate change to promote urban resilience, and 17 SDGS. Add in academic program. Importance of communication with the communities in transparent continuous way is crucial for ongoing and the future projects. There is a lack of communication knowledge and abilities with current investors, and they should be educated by civil engineers on this. Add in academic program. Laboratory use, and case studies in practical classes. Add Internships in with solar panels potential with EPCG of Montenegro, as a part of Methodology and academic program. Integrate learning outcomes of the course with specific objectives of the SMART WB project. Organize learning outcomes as per
	basics (5)		Bloom's taxonomy.

08 - UNIVERSITY OF SARAJEVO – ACE-BH

The following table (Table 4) presents a summary of the aspects University of Sarajevo's working group and Bosnia and Herzegovina non-academic partner (ACE-----BH) were particularly focused on in terms of modernization for each one of the courses to modernize for that Higher Education Institution.

Table 4 - UNSA and ACE-BH's aspects to modernize for UNSA's courses

Course name (ECTS)	Aspects to modernize UNSA	Aspects to modernize ACE-BH
	Spatial data, i.e. data about the natural and built environment (in this case) have been interpreted and visualized on analog maps for centuries, which until recently were our main aid in perceiving, understanding and orienting objects and events in space. The development of Geographical Information Systems (GIS) opened up new possibilities for managing spatial data and their properties. Spatial data infrastructure is an important segment of today's society in which the emphasis is on the protection of people and nature.	The faculty should ensure cooperation with GIS centers from B&H and the region. We propose to include in the courses the creation of seminar papers in the field of environmental protection with the application of GIS, which will be published in professional journals.
	The introduction of theseknowledge is planned through this course	
	 After adopting the material, the student will be able to: actively participate in thework of multidisciplinary teams in the development of plans and programs in the segment of environmental protection. 	
01. Environmental Protection (6)	 be able to use and adapt databases in GIS be able to create a basic GIS project independently solve problems that may occur in the use of a GIS project, independently create cartographic representations in GIS. 	
	Water protection implies a complex of measures and activities aimed at preserving and improving the qualitative and quantitative state of water, for the purpose of preserving the life and health of people and protecting the environment, and enabling its use for various purposes. In order to achieve the set goals, it is necessary to undertake numerous activities in research, planning, monitoring, detection, reduction and elimination of the causes that could lead to	 Intensify cooperation what Agencies and water Institutes from Bosnia and Herzegovina: Performing studentinternships in the mentioned institutions. Lectures by water experts with many years of experience inthe institutions. Visits to equipment manufacturers
	deterioration of the water condition. Given that water pollution is related to geosphere pollution in general, the approach to groundwater protection should be comprehensive. Namely, it is impossible to prevent pollution or water pollution if it is present in any component of the natural environment.	
	In this regard, it is extremely important to manage natural resources integrally. The basis of this approach is sustainable development, which tries to solve problems at the planning level.	
02. Water Protection I (6)	In this regard, a special segment related to groundwater remediation should be added as part of water protection, as well as the application of GIS software in the analyzes carried out as part of the syllabus.	
	Air pollution in urban areas is one of humanity's biggest problems, with road traffic contributing significantly to this problem. The solution to this problem is twofold; analysis, planning, and design of the traffic network and traffic-oriented measures (e.g. reduced speed zones) to reduce the emission of harmful gases, as well as to change thetraffic flow structure (i.e.the use of zero-emissionvehicles) and to promote the use of public transport. Within the framework of the Urban roads course, the analysis of different parts of the traffic network is studied in the context of capacity and average delay. Special attention is paid to analyzing intersection as places with the highest harmful gas emissions. The current course content lacks an analysis of the various	Lectures by professors of the Faculty of Traffic Engineering (urban mobility) and the Faculty of Architecture (urban planning) should be included in the teaching programs ofthe Faculty of Construction - application of an integrated approach to the course.
	geometric and traffic solutions that can significantly reduce harmfulgas emissions. For example, applying the appropriate type of intersection can reduce the number ofvehicle stops and the processes of acceleration and deceleration which results in lower emissions of harmful gases. Also, it is necessary to analyze the impact of replacing existing vehicles with internal	
03. Urban Roads (5)	combustion engines (and those with the lowest EURO standard)	



with zero-emission vehicles and compare the effects of such a measure with the effects of geometric changes. The procurement of modern equipment for measuring traffic-related air pollution is planned to modernize this part of the course. The second part of the course content refers to the planning of the traffic network from the aspect of their functional hierarchy respect for space, and general development of thecity (to enable fast and efficient connection of different contents but in a way that does not limit the development of individual urban units) and taking intoaccount the needs of all traffic participants. This part needs to be improved with examples of good practices for limiting the development of the traffic network in residential zone, turning asphalt into green areas, and how such measures affect the general traffic flow.			
The second part of the course content refers to the planning of the traffic network from the aspect of their functional hierarchy respect for space, and general development of thecity (to enable fast and efficient connection of different contents but in a way that does not limit the development of individual urban units) and taking intoaccount the needs of all traffic participants. This part needs to be improved with examples of good practices for limiting the development of the traffic network in residential zone, turning asphalt into green areas, and how such measures affect the general traffic flow.		with zero-emission vehicles and compare the effects of such a measure with the effects of geometric changes. The procurement of modern equipment for measuring traffic-related air pollution is planned to modernize this part of the course.	
affect the general traffic flow.		The second part of the course content refers to the planning of the traffic network from the aspect of their functional hierarchy respect for space, and general development of thecity (to enable fast and efficient connection of different contents but in a way that does not limit the development of individual urban units) and taking intoaccount the needs of all traffic participants. This part needs to be improved with examples of good practices for limiting the development of the traffic network in residential zone, turning asphalt into green areas, and how such measures	
		affect the general traffic flow.	

11 - UET - COPLAN

The following table (Table 5) presents a summary of the aspects European University of Tirana's (UET) Working group and Albania's non-academic partner (CO-PLAN) were particularly focused on in terms of modernization for each one of the courses to modernize for that Higher Education Institution.

Table 5 - UET and	COPLAN's aspects	to modernize	for UET's courses
			j

Cour (ECT	se name S)	Aspects to modernize UET	Aspects to modernize COPLAN
		This course aims to provide a link between technology and architecture. Certainly, the most common question asked is whether there is a connection between the development of technology and the development of architecture.	When discussing the link between technology and architecture it is important to overview the larger scale, at neighborhood level.
		The answer is yes. The development of technology has moved in the same direction as that of architecture.	In this regard, studies may incorporate design principles that prioritize energy efficiency sustainability and resilience
		Another question that is asked and that this course tries to answer is whether the development of architecture has led to the development of technology, or the development of technology has brought about the development of architecture.	Students can be taught about passive heating and cooling, green roofs, and natural ventilation.
		The facts show that it is the development of technology that has brought about the development of architecture. The more technology has developed, the more architecture has developed, due to the very fact that technology has been and is widely used in architecture.	Moreover, when talking about use of technology and building materials, the course may introduce the concept of Life Cycle Assessment to students.
		of constructions and what are their qualities. We thought that, in this direction, we should expand more in the direction of near-zero buildings.	This will apple them to understand the
		But what are these types of buildings? These buildings are buildings that have very little energy consumption. Students will first learn that this is not an objective to be achieved in the future, but that it is a reality already today.	environmental impact of a building or a product from its conception to its end of life. An advanced model of this may also include solutions for construction waste
		Students will learn in detail the characteristics of these buildings. Although the materials used for construction seem less important, they are	management and reduction.
		of great importance in a construction. The available materials determine the design of a building.	It is important to include in the course any
	Architecture	For this reason, in order to make the best possible building project, an architect must know quite well the range of materials available to construct the building, because the lack of a material can led to the failure of the project.	art on architecture technology, and to estimate which are the current barriers and potentials to be addressed by academic research. This will allow students to better
08	Technology (6)	In addition to the materials available to architects today, they must also know the characteristics of the materials. When we mention the characteristics,	understand the governance aspect of the



		we are talking about stability, hardness, the stresses they withstand and especially thermal conductivity.	sector and to position themselves as young professionals in the future.
		We will give importance to the thermal conductivity because it will directly affect the energy performance of the building. It goes without saying that with over 90,000 materials available it is very difficult to choose.	Highlighting case studies of sustainable buildings and communities to demonstrate
		To facilitate the process, special computer programs have been built where all the variety of materials along with their characteristics have been entered. We will focus especially on these programs. We will cover and mention all the programs that have been developed to date.	the successful implementation of sustainable design practices.
		For each program, the features and types of materials that are included in each of the programs will be mentioned. During the exercise sessions, one of these programs will be used for the students to familiarize themselves with the work procedure.	The course needs to be extended outside of the classroom, through site visits, meetings with construction industry to observe the production cycle, interviews, or surveys with bouseholds to understand the level of
		As can be seen in the program of the course, the concrete core of the buildings is also included. Since most buildings are constructed of concrete, we will delve into this concept.	thermal comfort in their households, etc. The course may also teach students about sustainable design principles that can help reduce the carbon footprint of buildings
		We will delve into the characteristics of the concrete core. We will talk extensively about the engineering characteristics and the calculations that are made for the core.	Finally, ethical principles and Responsible Research and Innovation dimensions need to be considered when dealing with
		Reinforced concrete frames are used for many buildings today. In this regard, we will delve into the calculations of these buildings.	technological issues, and any type of academic work in general. This is an
		To prepare professionals as capable as possible for the labor market and for this element, we will explain the computer programs that are used today to calculate these skeletons.	overarching issue relevant for all courses.
		Since technology is in great development steps, architecture will also develop accordingly. New technologies for architecture will be developed.	
		For this reason, we will try to encourage students to develop analytical thinking. So, we will aim for students not only to apply the existing technologies, but also to possibly contribute to the development of new technologies.	
		Each technology used for the construction of a building logically affects its final characteristics. According to statistical data, buildings are ranked among the main energy consumers.	
		Today, one of the main challenges facing the construction industry is the construction of buildings that consume as little energy as possible for lighting, heating, ventilation, hot water, and sanitation, etc.	
		For this reason, we will pay more attention to the materials used in their construction. As these materials have a major impact on the final product: the building.	
		An element that should not be overlooked is the energy needed to build the building. Therefore, for each technology, we will also explain the energy impact.	
			An added value would be to include a visit
		Construction science is one of the key training disciplines for civil engineers. In this course, the student is introduced to the main loading schemes of buildings. Consequently, in this course the student also learns calculation	to the Institute of Geosciences (IGJEUM) to observe how seismic, geologic, and climate- related data are evaluated and assessed.
		methods for each case.	Also, it is advisable to encourage visits to the sites of the buildings that the students
		In this course, the concept of energy theory is also treated. Students thus learn how energy flows in a charged system.	will draw calculations. From a theoretical point of view, students
09	Construction	For statically indeterminate systems, calculation methods are given to find	need to be given general knowledge on
	Sciences (6)	the energy that is produced in such a system. Students also learn to	climate resilience and how to design and



calculate how much energy is lost and how much energy remains in the system. Almost all building systems are statically indeterminate. So, these are the systems that students will encounter during their daily work. For this reason, we argue that one of the directions in which we will improve the course program is this direction. We will delve even deeper into the energy theorem. We thought to deal more deeply with the necessary calculations in such cases. But, as these calculations are known, for complex systems, such as today's civil and industrial buildings, they are very burdensome and require a lot of time and effort. For this reason, we thought to delve a little deeper into the computer programs that are used for such calculations. We will explain the main programs that are used today for this purpose. We will explain the features of each program. Since there are many programs that are used for this purpose, we will explain in which cases each of the programs is used. We will explain the pros and cons of each program. We have also thought about improving the coursework. So far in the course assignment students are asked to calculate loads and forces for a scheme given to students by the course lecturer. To adapt as much as possible to reality, we thought that students should calculate the loads for a concrete building. And in addition to loads and forces, we thought of adding the requirement of calculating the energy of the building, because of its loading. To make the students as skilled as possible, they will be required to solve the task by means of a computer program. Although so far, we have talked about the energy theorem, even the calculation of loads, which is the essence of the course, is a very long and burdensome process for a building. Undoubtedly, nowadays these calculations are no longer done as they used to be, with pencil and paper. Computer programs are also being used for this. As for everything else, for this case too, there are a variety of programs that are used. The features of each of the programs will be mentioned.

The pros and cons of each program will be explained. The situations in which each of the programs will be used will be explained. Since we have planned to give the students a real building, they will be required to make the calculations through the computer program.

As shown in the program, the course also deals with seismic engineering. Since Albania is located in an active seismic zone, from the great damage caused by the earthquake of 2019 and from the devastating earthquake that hit Turkey a few months ago, we thought to expand and deepen this concept.

We will delve into the loads that a seismic movement causes in the building. We will discuss in detail how building loads increase under the action of an earthquake. We will solve and discuss concrete cases to calculate buildings in such cases.

We will expand students' analytical thinking for such cases, so that students are able not only to calculate, but also to analyze and above all to propose solutions for certain cases.

Of course, in this case we will also discuss anti-seismic codes.

construct buildings that can withstand extreme weather events such as floods, storms, and wildfires.

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		First, we will clarify if these codes are applicable in Albania. We will deal with their implementation in other countries located in the same seismic zone as our country.	
		The difference between buildings built in countries where anti-seismic codes apply, and buildings built in our country will be explained.	
		Through discussions in the seminars, concrete cases will be given calculations for buildings built according to anti-seismic codes, naturally comparing them with buildings that were built not respecting these codes.	
		Modernization, as a process, is usually related to the processes of urbanization and industrialization. As Kendall (2007) points out, "Urbanization accompanied modernization and the rapid process of industrialization".	When discussing urban design curricula, it is important to underline the elements related to form and morphology that may influence the urban micro-climate.
		The modernization of the developed country through urbanization, industrialization, and economic policy has benefited these countries economically. However, these places, more or less, have also experienced problems that include the growing disparity between the rich and poor, the urban sprawl, the urban center decline, and ecological issues.	do not only focus on RES and energy consumption in cities, but include some base knowledge on urban microclimate, importance of greenery, environmental performance indicators and standards,
		And along with the development of industrial modernization, the urban population will increase or decrease as the relocation of industrial and commercial investments, associated with urban planning policy.	livelihood indicators related to health issues, and urban microclimate, before focusing on the aspect of energy.
		There are urban changes going on all over the world. As cities grow, jobs change, and policies change, people will move around. This can change the needs for urban infrastructure and services the government and businesses must provide. For instance, if many families decide to have children in one district, the need for schools and parks may grow. All these issues are going to be addressed during the lectures of the course.	It is also important to include the theory of resilience in urban planning and design, and to address (through case studies) the impact of climate change in urban settlements (from an environmental and
		However, if many people decide to leave a place at once, there won't be as much of a need for public and private services, so funding may be cut, and businesses may go elsewhere. This can cause problems for the remaining	societal perspective)
		residents. During the course we are going to explain for the first time the concept sustainable energy planning. This because Planning it should create conditions for the efficient use of energy in different types of inhabited areas and minimize energy transportation costs. There is a substantial untapped potential for the rational use of energy consumption in cities.	Adding some information about current legislation, and instruments in place (strategies, plans, etc.) that promote green urbanism, climate change mitigation, disaster-risk reduction, nature-based solutions, etc., at urban level. An emphasis
		The increasing consumption of oil and gas has not only led to a decrease in fossil fuel reserves but also caused many unwelcomed changes on our planet. Serbia is being confronted with such issues on daily basis. Since the Country imports a major part of its energy resources, in future it will have to pay much more attention to the rational use of energy, as well as to the use of renewable energy sources (RES).	is to be put to understanding development standards, such as Floor to Area Ratio; Green Area per capita; density; etc. and their impact on urban environmental performance.
		As much as 62% of the total electricity produced in Serbia comes from coal burning (low-calorie coal of worst quality) and processing of liquid fuels, which says a lot about Serbia's dramatic ecological situation. In Serbia, private households account for 37% of total heath energy consumption, whilst buildings in general are responsible for 50% of total energy use. Out of that, heating accounts for 60%, electrical appliances in households for 30%, and cooling and other needs for further 10%.	It is important to focus on data for energy production of Albania (not Serbia) and to estimate how the layout of buildings may positively or negatively influence passive energy saving / thermal insulation, etc.
		Cities are complex systems and mammoth energy consumers. Their gigantic consumption of energy, water, materials, as well as all natural and manmade means, has resulted in an unprecedented impact on Earth's natural environment. Nevertheless, metropolitan areas also constitute economic, political, and cultural hubs where knowledge and innovation flourish.	If the course would be about urban planning, it could include some methodologies on how to assess energy consumption related to land use / and the distribution of green areas.
10	Urban Design I (5)	Thanks to the wealth and capacities available in large urban settlements, the cities are in the position to take a leading role in developing and	Moreover, through a survey of socio-



planning. When dealing with issues such as greenhouse gas emissions, infrastructure systems, energy efficiency, transport, or municipal waste, solutions should be based on available technologies and a complex aggregate of information, communication, and regulation elements.

An urban planning method that would allow participation of experts from various fields could be a key clue to the dilemmas. Such a mixed group of specialists could propose sustainable solutions to energy consumption and environmental protection. Today, this kind of integrated planning can be conducted thanks to the information and communication technologies, as well as to the simulation software providing an unlimited number of alternative solutions. On the one hand, this technique would enable systemic analysis of the use of various forms of energy in the conceptual stage of planning. On the other hand, it would allow us to calculate the project price and the time of return on investment at any point.

economic nature, the curricula could include some aspects of energy poverty.

May teach students about renewable energy sources and how they can be integrated into urban planning. This can involve discussing the role of solar, wind, and other renewable energy sources in powering buildings and infrastructure, as well as the benefits of distributed energy systems.

2.2.4 Courses to modernize classification according to CSUD categories

Once, all the information from the different partners was collected and included in Smart WB's Moodle Platform, the next step consisted in categorize the courses to modernize. In this context, it was



very important to meet project's Milestone MS4 Curricula Analysis which comprised an exhaustive analysis of Third Countries not associated to the Programme HEIs curricula as well as a comparison with the existing study programs in the EU Member States and Third countries associated to the Programme. The Report on Existing Curricula Related to CSUD in EU Member States and Third Countries non or associated to the Programme (D2.3) was finished on month 5 of the project (M5, May 2023).

From the analysis of the existing curricula in all the countries involved in the project the report D2.3 was able to categorize all the courses into nine groups that are adapted to the Climate Smart Urban Development field. Specifically, these groups were:

- 01. Spatial and urban planning
- 02. Architecture and building design
- 03. Material science
- 04. Energy efficiency
- 05. Road design and mobility
- 06. Urban water management
- 07. Geodesy and analysis
- 08. Planning and participation procedures
- 09. Governance and planning policies.

Once these categories were defined the next step was to assign each one of the courses to modernize to each one of the nine generic categories previously defined (Table 6).

No/Partner	Course name (ECTS)	Level of study	Category
	Communal Infrastructure (3)	Bachelor (240 ECTS)	Urban water management
	Introduction to Civil Engineering (3)	Bachelor (240 ECTS)	Architecture and building design
	Building materials (7)	Bachelor (240 ECTS)	Architecture and building design
	Elements of buildings (6)	Bachelor (240 ECTS)	Architecture and building design
	Urban planning basics (5)	Master (120 ECTS)	Spatial and urban planning
1/UoM	Maintaining, rehabilitation and reconstruction of buildings (5)	Master (120 ECTS)	Architecture and building design
	Environmental Protection (6)	Master (120 ECTS)	
	Water Protection I (6)	Master (120 ECTS)	Urban water management
8/UNSA	Urban Roads (5)	Master (120 ECTS)	Road design and mobility
	Materials for energy efficient and sustainable buildings (5)	Master (120 ECTS)	Material science
	Durability (resilience) and maintenance of structures (6)	Master (120 ECTS)	Material science
	Construction optimization (5)	Master (120 ECTS)	
9/UNMO	Special types of concrete (5)	Master (120 ECTS)	Material science
	Spatial planning (5)	Bachelor (240 ECTS)	Spatial and urban planning
10/UNBI	Energy efficiency of buildings (5)	Master (120 ECTS)	Energy efficiency

Table 6 - Categorization of Course to modernize according to the groups defined on Report D.2.3



	Construction Sciences (6)	Bachelor (180 ECTS)/ Master - Integrated Diploma - (300 ECTS)	Architecture and building design
	Urban Design (5)	Master (120 ECTS) / Master - Integrated Diploma - (300 ECTS)	Spatial and urban planning
11/UET	Architecture Technology (6)	Master - Integrated Diploma - (300 ECTS)	Architecture and building design
	General Geodesy 1 (6)	Bachelor (180 ECTS)	Geodesy and analysis
	General Geodesy 2 (7.5)	Bachelor (180 ECTS)	Geodesy and analysis
	Topographic surveys and State networks 1 (6)	Bachelor (180 ECTS)	Geodesy and analysis
	Topographic surveys and State networks 2 (7.5)	Bachelor (180 ECTS)	Geodesy and analysis
12/UPT	Knowledge of urban planning and projects (4)	Master	Spatial and urban planning
	Urban Economics (3)	Master	
	Local Governance (6)	Master	Governance and planning policies
	Urban planning studio (6)	Master	Spatial and urban planning
13/U_POLIS	Geographic Informational systems (6)	Master	Geodesy and analysis

Regarding the courses to modernize which are included in WB's HEIs Bachelor's programs is important to note that there are no courses neither in the category "Energy Efficiency" nor "Governance and Planning Policies" and there is just one course in the category "Spatial and Urban Planning". In addition to that and regarding the courses included in master's programs, the distribution in categories is more uniform and the categories with more courses are "Urban Water Management", "Geodesy and Analysis" and "Road Design and Mobility".

2.2.5 Courses to modernize allocation to SmartWB's EU and Third Countries associated to the Programme partners:

Step 4. From March 24th to July 9th 2023

Due to the necessity to transfer innovative and newly developed technologies, know-how and best practices from the EU Member States and third countries associated to the Programme to third countries non-associated to the Programme, the next step in the process consisted of allocating the courses to modernize to the EU and Members Associated to the Programme HEIs. These partners have a large experience in the successful education and training of students in CSUD, advanced knowledge, qualified experts, modern laboratories for simulating CSUD solutions and rich experience in the development of relations between business and academy. Experiences from EU Member States and third countries associated to the Programme HEIs are a necessity to speed up the acceptance of climate-friendly solutions and education of students for green jobs applied directly in the urban development sector.

The allocation of courses to be modernized according to the expertise of the EU and Third Countries associated to the Programme partners took place in June 2023 (M6). EU and Third countries associated to the Programme partners were assigned different courses to modernize according to their experience and expertise in the field of each course. Given the fact that University of Zagreb is a highly recognized expert in the CSUD's category "Geodesy and Analysis" all the courses in this area were assigned to them. The very same logic was used with the category "Spatial and Urban Planning" which BOKU has a

significant experience in. It is important to note that the University of Nis (UNI) took the highest number of courses to modernize, particularly in the categories of "Architecture and Building Design" and "Material Science" (see Table 7 below).

No/Partner	Course name (ECTS)	Level of study	Category	EU & associated partners involved in providing support to modernize WB HEIIs courses
	Building materials (7)	Bachelor (240 ECTS)	Architecture and building design	UNI
	Communal Infrastructure (3)	Bachelor (240 ECTS)	Urban water management	THOWL, NMBU, BOKU
	Elements of buildings (6)	Bachelor (240 ECTS)	Architecture and building design	UNI
	Hydrotechnical Meliorations	Master (120 ECTS)	Urban water management	THOWL & NMBU
	Introduction to Civil Engineering (3)	Bachelor (240 ECTS)	Architecture and building design	UNI
	Maintaining, Sanitation and Reconstruction of Buildings (5)	Master (120 ECTS)	Architecture and building design	UNI
1/UoM	Urban planning basics (5)	Master (120 ECTS)	Spatial and urban planning	BOKU
	Environmental Protection (6)	Master (120 ECTS)	Spatial and urban planning	BOKU
	Urban Roads (5)	Master (120 ECTS)	Road design and mobility	UNI
8/UNSA	Water Protection I (6)	Master (120 ECTS)	Urban water management	THOWL, NMBU, BOKU
	Durability (resilience) and maintenance of structures (6)	Master (120 ECTS)	Material science	UNI
	Materials for energy efficient and sustainable buildings (5)	Master (120 ECTS)	Material science	UNI
	Special types of concrete (5)	Master (120 ECTS)	Material science	UNI
9/UNMO	Sustainable Buildings from Natural Materials (5)	Master (120 ECTS)	Material science	UNI
	Building materials (5)	Bachelor (240 ECTS)	Material science	UNI
	Energy efficiency (5)	Master (120 ECTS)	Energy efficiency	URJC
10/UNBI	Spatial planning (5)	Bachelor (240 ECTS)	Spatial and urban planning	воки
	Architecture Technology (6)	Master - Integrated Diploma - (300 ECTS)	Architecture and building design	UNI
	Construction Sciences (6)	Bachelor (180 ECTS)/ Master - Integrated Diploma - (300 ECTS)	Architecture and building design	UNI
11/UET	Urban Design I (5)	Master (120 ECTS) / Master - Integrated Diploma - (300 ECTS)	Spatial and urban planning	воки
	General Geodesy 1 (6)	Bachelor (180 ECTS)	Geodesy and analysis	UNIZG
	General Geodesy 2 (7.5)	Bachelor (180 ECTS)	Geodesy and analysis	UNIZG
12/UPT	Knowledge of urban planning and projects (4)	Master	Geodesy and analysis	UNIZG

Table 7 - Detail of EU and Third Countries associated to the Programme partners' assignment of courses to modernize

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	Topographic surveys and State Geodetic networks 1 (6)	Bachelor (180 ECTS)	Spatial and urban planning	BOKU
	Topographic surveys and State networks 2 (7.5)	Bachelor (180 ECTS)	Geodesy and analysis	UNIZG
	Geographic Informational systems (6)	Master	Geodesy and analysis	UNIZG
	Local Governance (6)	Master	Governance and planning policies	URJC
	Urban Economics (3)	Master	Governance and planning policies	URJC
13/U_POLIS	Urban planning (6)	Master	Spatial and urban planning	воки

2.2.6 Modernized Course Benchmark: Water Protection I

Step 5. From June 6th to July 4th 2023

One of the agreements in Vienna's Project Management meetings at the end of May 2023 was to develop a benchmark of one of the courses to modernize. University of Sarajevo volunteered with the course Water Protection I. Two EU Partners, THOWL and NMBU – as highly recognized experts in the Urban Water Management field – were directly involved in the modernization process of this course. The logic behind this action was that the course could serve as a pilot or benchmark for the rest of the courses to be modernized. June 30th, 2023, was the deadline defined for the completion of the very first draft of the course.

On July the 4th 2023 the modernized version of the Water Protection I Course was uploaded into the SmartWB platform and distributed to all SmartWB partners. Figure 3 shows the content and scope of the Proposal for the modernization of the course. In the file were included the details of the aspects University of Sarajevo was more interested in modernizing. The comments of EU partners emphasizing aspects which potentially could contribute to course's modernization are included too. Finally, it is important to note, that in the template all the new and modernized content is presented in a different ink color – red – so that it is possible to quickly check the new content, activities and bibliography included in the new version of the course as well as the weight and importance of these new modernized aspects in comparison with course's original version. Two new lessons and two practical activities were included in the modernized version of the course as well as a new bibliographical refence in English directly related with the new content was included.

First, regarding the Syllabus, the following topic & lessons have been included:

"6. Groundwater pollution: Analysis and interpretation. Groundwater remediation: methods, monitoring parameters and examples. Artificial groundwater recharge: methods and procedures.

7. Early warning system and its importance on water quality protection of surface water and on water quality and quantity protection of groundwater. Analysis and application. Systematic monitoring and IT. Examples of good practices".

Second, regarding courses' practical activities, the following ones have been added:

"2. Workshop: Discussion on different strategies and projects of groundwater remediation. Parameters for monitoring remediation 3. SWOT analysis: System of monitoring and timely response to the increase in pollution at the source of groundwater in Sarajevsko polje".

Finally, in the Bibliography section, in generic references, the following one has been included:

"Paul E. Hardisty, Ece Ozdemiroglu The economics of groundwater remediation and protection, Publisher: CRC Press, Year: 2005, ISBN: 1566706432,9781566706438".

Figure 3 - Benchmark & Pilot Course: University of Sarajevo's Water Protection I Course

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Co-funded by the European Union) smårt WB			WP3 course proposal
		PRC	DJECT INFO	
Smart VVB	Project title	Curricula inno green and ene	vation in climate-smart urb rgy efficiency with the non-	an development based on academic sector
	Project acronym Project reference number Funding scheme	SmartWCR		
	Web address Coordination institution	www.smartwb).ucg.ac.me	
	Project duration	36		
COURSE TEMPLATE ON		DOCUMEN	T CONTROL SHEET	
WATER PROTECTION I	Work package	WP3 Capacity	building of WB HEIs	
	Ref. no and title of activity	T3.1 Moderniz industry sector	ation of university courses i r	n collaboration with the
	Title of deliverable	D3.1. Report o	n modernized university co	irses
	Lead institution	URJC		
	Author(s)	Carmen de Pal	blos-Heredero & Miguel Bla	nco-Callejo
	Document status	V1 (08/03/202	3)	
	Dissemination level	Public		
This project has been funded by the European Union. Views and opinions expressed <u>are</u> <u>however</u> those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency [EACEA].		VERSIONING AND	CONTRIBUTION HISTORY	
Neither the European Union nor EACEA can be held responsible for them.	Version	Date	Revision description	Partner responsible
	v.01 8 th	March, 2023	First template	URJC
Curricula innovation in climate-smart urban development based on green	v.02 19	th June 2023		THOWL
and energy efficiency with the non-academic sector	v.03 27	" June 2023		NMBU
Project: 101081724 — <u>SmartWB</u> — ERASMUS-EDU-2022-CBHE				





WP3 course proposal

Explanation of what we would like to improve:

Water protection implies a complex of measures and activities aimed at preserving and improving the qualitative and quantitative state of water, for the purpose of preserving the life and health of people and protecting the environment and enabling its use for various purposes.

In order to achieve the set goals, it is necessary to undertake numerous activities in research, planning, monitoring, detection, reduction and elimination of the causes that could lead to deterioration of the water condition.

Given that water pollution is related to geosphere pollution in general, the approach to groundwater protection should be comprehensive. Namely, it is impossible to prevent pollution or water pollution if it is present in any component of the natural environment.

In this regard, it is extremely important to manage natural resources integrally. The basis of this approach is sustainable development, which tries to solve problems at the planning level.

In this regard, a special segment related to groundwater remediation should be added as part of water protection, as well as the application of GIS software in the analyzes carried out as part of the syllabus.

v.02	19 th June 2023	THOWL
<mark>In this rega</mark>	rd, a special segment related to groundwater	remediation should be added as part of
water prot	ection , as well as the application of GIS softwa	are in the analyzes carried out as part of the
<mark>syllabus.</mark> Tł	nerefore, parameters detecting groundwater p	pollution, its analysis and interpretation are
added to th	ne syllabus. Furthermore, different strategies	and projects of groundwater remediation
<mark>are discuss</mark>	ed and parameters for the monitoring of rem	ediation are presented and discussed with
<mark>the studen</mark>	ts.	

v.03 27th June 2023 NMBU Since ground water is not well addressed in your current curricula (if I understood correctly) that is

certainly a good point to add. Ground water pollution remediation is a demanding part, but quantity wise- artificial ground water recharging could be relevant. Early warning systems on water quality in surface water could also be relevant.



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WP3 course proposal

WATER PROTECTION I		
Туре	Compulsory	
Teaching period	Master course, III semester	
ECTS credits	5	
Language	Bosnian	

II. Presentation

The main objective of this course is to acquire basic knowledge about the characteristics of natural waters, changes in water conditions, causes of changes, and water protection activities, <u>measures</u> and plans. Understanding the importance and application of an integral approach in the protection of water resources. Independent analysis of the state of water resources, and application of mathematical modeling as a tool for forecasting and solving problems in water protection.

III. Competences

- Generic competences

 1. Ability to understand and analyze the basic physic -chemical and ecological characteristics of water, sources and types of water pollution, the impact of pollution on the state of the water, measures and activities in water protection,
 - 2. Ability to understand and participate in planning and solving problems in water protection with optimal use of available resources and data, with appropriate software support.
 - 3. Ability to present one's own points of view and <u>analyze</u> and evaluate alternatives in using water protection.
 - 4. Ability to verify and integrate up-to-date knowledge in the field of water protection from the point of view of civil engineers.
 - 5. Ability to apply knowledge to reducing the negative impact of human activities on the water quality creatively.
 - 6. Ability to <u>analyze</u> and propose a comprehensive and sustainable solution to the problem of surface and underground water protection.
 - 7. Ability to apply the knowledge gained in the course to solving practical tasks using modern software solutions.
 - 8. Students apply their acquired knowledge and problem-solving skills in new or unfamiliar environments within broader (or multidisciplinary) contexts related to the area of water protection.

Specific competences

- Know how to identify the needs and requirements of the context in which the application of methodological tools is needed and learn to propose appropriate solutions for research questions arising from the framework of the need for water protection.
- 2. Develop reasoning and critical thinking for the analysis of water quality through the identification, description, and diagnosis of current environmental problems in which the student uses the tools provided by modern technologies.
- 3. Propose appropriate solutions based on the studied and acquired knowledge.





WP3 course proposal

IV. Contents IV.A. Syllabus

- Basic characteristics of water resources. Framework directive on surface and ground water and current EU and BH legislation in the field of water protection. Examples of good and insufficient approaches to water resources protection.
- Pressures on water resources. Sources of water pollution. Overexploitation of water resources. Dilution and self-purification - processes and principles. Soil erosion and water erosion and the impact on the state of water resources. Water monitoring. Information support.
- Approach to water protection: Sustainable development-Concept, Dimensions and importance, Differences and advantages compared to unsustainable, Sustainable development and water resources.
- 4. Water protection planning: measures and procedures. Basic principles of planning, control of pollution sources, basics of a systemic approach to water resources protection, and basic elements of creating a water protection plan.
- 5. Surface water pollution: Control mechanisms and measures for reducing. Effluent quality. Receivers and protection of aquatic ecosystems. Environmentally acceptable flow. Procedures and measures for watercourse recovery in the basin, water corridor, and in the watercourse bed. Ecological engineering and conventional engineering in the function of watercourse recovery.
- 6. Groundwater pollution: Analysis and interpretation. Groundwater remediation: methods, monitoring parameters and examples. Artificial groundwater recharge: methods and procedures.
- 7. Early warning system and its importance on water quality protection of surface water and on water quality and quantity protection of groundwater. Analysis and application. Systematic monitoring and IT. Examples of good practices.
- 8. Mathematical models and their application on water protection. Examples.

IV.B. Training activities	
Туре	Description
Reading	Reading of Books & Academic Articles
Practical / Problem solving	1. Real-case analysis (Case-Study) and problem
	solving/ Practical Problem-Based learning:
	Mapping water guality:
	2. Workshop: Discussion on different strategies
	and projects of groundwater remediation.
	Parameters for monitoring remediation.
	3. SWOT analysis: System of monitoring and
	timely response to the increase in pollution at
	the source of groundwater in <u>Sarajevsko polje.</u>
Other	Seminars from industry experts/ -

V. Student workload (hours)	
Lecture classes	45
Practical classes/problem-solving, case studies,	30
etc.	
Practical sessions in technological laboratories,	-
hospitals, etc.	
Tests	2x15=30

3


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Academic tutorials	15
Related activities: conferences, seminars, etc.	5
Preparation of lecture classes	-
Preparation of practical classes, problem-	-
solving, case studies, etc.	
Test preparation	-
Total student workload	125

VI. Methodology and academic program		
Туре	Period	Content
Theoretical Classes	Week 1 to Week 15	Lectures, <u>exposition</u> and resolution of research works
Practical Classes	Week 1 to Week 15	Practice resolution, cases, research discussions/laboratory/simulati ons
Seminars & exam	Week 16 to Week 20	Seminars and exam

VII. Assessment methods

VII.A. Assessment weighting

Continuous ordinary assessment:

The distribution and characteristics of the assessment tests are those described below. Only in exceptional case and for special reasons may the teacher add changes to the Guide. These changes will require the prior consultation with the Subject Head and the prior and explicit authorization of the Degree Program Coordinator, who will notify the Vice-Rector's office in charge of Academic Affairs of the modifications made. In any case, the changes proposed must consider the stipulations of the verified report. For these changes to take effect, they must be duly communicated at the start of the course to the students using Aula Virtual.

The combination of activities that are not re-assessable cannot exceed 50% of the subject grade and, in general, cannot have a minimum grade (except for the case of laboratory or clinical work placements, where duly justified), and tests which exceed 60% of the subject weighting cannot be added.

Extraordinary assessment: Students who do not manage to pass the ordinary assessment, or who did not attend, will be subject to completion of an extraordinary assessment to verify their acquisition of the skills established in the guide, only for activities that are re-assessable.

Description of the tests for assessment and their weights

A final exam that will be taking place at the end of the seminar. The exam will be a 40% of final grade, the rest 60% comes from the continuous evaluation. The exam will take place in physical class. Only if the situation at the moment does not allow it, the exam will be <u>on line</u>.

VII.B. Assessment of students with an academic exemption

Student who <u>wish</u> to opt for this assessment will have to get an academic exemption for the subject, which they will have to request from the Dean or Director of the Centre which teaches their course. An academic exemption may be granted where the subjects own characteristics allow for it.

Subject with the possibility of an exemption: Yes

VII.C. Review of assessment tests

In accordance with the exam appeal regulations of the University of Sarajevo



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WP3 course proposal

VII.D.-Students with a disability or special educational needs

Curricular adaptations for students with a disability or special educational needs will be determined by the Disabled Students Support Department, in accordance with the regulations governing the Disabled Students Support service, approved by the University of Sarajevo to guarantee equal opportunities, inclusive treatment, universal accessibility and a greater guarantee of academic success.

For this purpose, this Department will have to issue a curricular adaptation report, therefore students with disabilities or special educational needs must contact the Department to analyze the different alternatives together.

VII.E.-Academic behavior, academic integrity, and honesty

The University of <u>Sarajevo is</u> completely committed to the highest standards of academic integrity and honesty. Therefore, studying at the University of Sarajevo means you accept and agree to the academic integrity and honesty values described in the University's Code of Ethics. To monitor this procedure, the University has Regulations on academic behavior at the University of <u>Sarajevo and</u> uses different tools (anti-plagiarism, supervision) which provides a collective assurance that these essential values are completely developed.

VII. Bibliography

Generic References

- Books:
- Hadžić, E. Basics of groundwater protection in granular media, University of Sarajevo Faculty of Civil Engineering, Sarajevo, 2013
- Hadžić, E., Bonacci, O. Environmentally acceptable watercourse management. University of Sarajevo-Faculty of Civil Engineering, 2019
- Paul E. Hardisty, Ece Ozdemiroglu The economics of groundwater remediation and protection, Publisher: CRC Press, Year: 2005, ISBN: 1566706432,9781566706438

Specific References

1. Tedeschi, S. Protection of water systems and wastewater treatment, Civil Engineering Institute Zagreb, 1996

IX.Lecturers/Teachers/Professors	
Lecturer/teacher/professor's name	Prof.dr Emina Hadžić
E-mail address	eminahd@gmail.com
Area	Water Resources and Environmental Engineering
Link	https://gf.unsa.ba/



2.2.7 Courses to Modernize First Draft's Collaborative Development

Step 6. From July 5th to 2023- September 15th, 2023

Once the benchmark was presented and shared among all Smart WB partners. All the partners directly involved in the modernization of each one of the courses worked collaboratively to develop the first draft version of the modernized courses.

For example, Rey Juan Carlos University worked actively with Polis University and particularly with lecturers involved in the teaching of the course "Local Governance" to make suggestions to modernize the course (Figure 4).

Figure 4 - Example of the actions taken to modernize Polis University's Local Governance course



Regarding to this, we have been thinking that a good way to modernize your course would be to add a Chapter to your teaching guide roughly entitled "Smart Cities in the EU" where you would present a case study of a European City and, in addition to that, you would create an students' assignment asking them to present a case study of their choice from a city in the EU. The new chapter would have two basic objectives: 1) Present and describe how EU cities are facing the challenges related with sustainable local governance & management 2) Analyze how the identified initiatives (in both – the case study and students' cases) could be implemented in the context of your country at the local government level.

It is just a very first step in the course's modernization process but we would like to know what your thoughts about this proposal would be.

Thank you very much in advance,

Best regards from Madrid

Carmen & Miguel

Universidad Rey Juan Carlos Carmen de Pablos Heredero Catedrática de Organización de Empresas/Full Professor in Management Departamento de Economía de la Empresa (Adm., Dir. y Org.), Economía Aplicada II y Fundamentos de Análisis Económico Directora MU Organización de Empresas / Business Organization co-Directora Master en Gestión de Proyectos Logísticos SAP -MPLSAP Universidad Rey Juan Carlos Campus de Madrid-Sede Vicálvaro (Madrid), España carmen.depablos@urjc.es | www.urjc.es | @URJC |

In addition to that, a folder in the Smart WB's Moodle Platform was created with the title "COURSES TO MODERNIZE – FIRST DRAFT" (Figure 5) composed by 7 sub-folders, one for each of the 7 Western



Balkans' HEIs in order the partners were able to submit the first draft of the modernized courses. Due date for this very first submission of the modernized courses was September the 15th 2023 (M9).

Figure 5 - SmartWB Platform: Course to Modernize First Draft Folder

≡	Distance Learning	🦺 🍺 Miguel Blanco 🦳
	COURSES TO MODERNIZE - FIRST DRAFT	
	* 🚍 01. UOM	
	01_UOM_Communal infrastructure_mo_thowl.docx	
	01_UOM_Hydrotechnical Meliorations_mo_thowl.docx	
	01_UOM_SmartWB_Building materials_01Teaching Guide_UNI.docx	
	01_UOM_SmartWB_Elements of building_03Teaching Guide_UOM_UNI.docx	
	01_UOM_SmartWB_Introduction to Civil Engineering_05Teaching Guide_UOM_UNI.docx	
	01_UOM_SmartWB_Maintaining Sanitation and reconstruction of buildings_06Teaching Guide_UNI.docx	
	01_UOM_SmartWB_Urban Planning Basics_Aspects to modernize_BOKU(1).docx	
	* 🗰 08. UNSA	
	08_UNSA_Environmental Protection_ course description_v02.docx	
	08_UNSA_Urban roads_course description_v02.docx	
	08_UNSA_Water Protection I_ course description_v04_BENCHMARK.docx	
	UNI_08_UNSA_SmartWB_Urban roads_v01_01Teaching Guide.docx	
	т 🗰 09. UNMO	
	9_UNMO_SmartWB_Durability, Resiliance and Maintenance of Structures_01Teaching Guide_UNI.docx	
	9_UNMO_SmartWB_Materials for energy efficient and sustainable buildings_02Teaching Guide_UNMO_UNI.docx	
	9_UNMO_SmartWB_Special Types of concrete_03Teaching Guide_UNI.docx	
	09_UNMO_SmartWB_Sustainable Buildings from Natural Materials_04Teaching Guide_UNI.docx	
	T 🚍 10. UNBI	
	10_UNBI_SmartWB_Building Materials_01Teaching Guide_UNI.docx	
	10_UNBI_SmartWB_Energy Efficiency_02Teaching Guide -aspects for modernization included.docx	
	10_UNBI_SmartWB_Spatial Planning_03Teaching Guide_BOKU.docx	
	* 🚍 11. UET	
	11_UET_SmartWB_Architectural Technology I_01Teaching Guide_UET_UNI.docx	
	11_UET_SmartWB_Construction Sciences_02Teaching Guide_UET_UNI.docx	
	11_UET_SmartWB_Urban Design I_Aspects to modernize(2).docx	
	* 🗰 12. UPT	
	12_UPT_SmartWB_General Geodesy 1_UPT_UZG.docx	
	12_UPT_SmartWB_General Geodesy 2_UPT_UZG.docx	
	12_UPT_SmartWB_Knowledge of Urban Planning and Projects_04Teaching Guide_BOKU(1).docx	
	12_UPT_SmartWB_Topographic Surveying and State Geodetic Networks 1_UPT_UZG.docx	
	12_UPT_SmartWB_Topographic Surveying and State Geodetic Networks 2_UPT_UZG.docx	
	T 🖿 13. U_POLIS	
	13_UPOLIS_SmartWB_GIS_ADVANCED_02Teaching_Guide_Modernization_Proposal (1).docx	
	13_UPOLIS_SmartWB_Local Governance_02Teaching Guide_Modernization Proposal.docx	
	13_UPOLIS_SmartWB_Urban Economics_03Teaching Guide_Modernization Proposal.docx	
	13_UPOLIS_SmartWB_Urban Planning_Aspects to modernize_BOKU(1).docx	

2.2.8 Courses to Modernize Second Draft's Collaborative Development

Step 7. From September 16th to December 12th 2023

EU and Third countries associated to the Programme partners in charge of each course modernization working in collaboration with WB's academic and non-academic partners were asked to present a second draft for each modernized course.

A folder named "COURSES TO MODERNIZE – SECOND DRAFT" was created in SmartWB's Moodle Platform, so that all the partners could submit the second draft version of the courses.



Due date for this task – December 12^{th} – was just before Madrid Training Session & Project Meetings, as all the partners involved in the process could have the opportunity to exchange face to face ideas regarding courses' modernization.

2.2.9 Courses to Modernize Definite Version Submission

Step 8. From December 13th, 2023, to February 1st 2024

EU and Third countries associated to the Programme partners in charge of each course modernization working in collaboration with WB's academic and non-academic partners were asked to present the final version of each modernized course.

A folder named "COURSES TO MODERNIZE – FINAL VERSION" was created in Smart WB Moodle Platform so that all the partners were able to submit the second draft version of the courses. Specific folders for each one of the Western Balkan's HEIs were created so that they could upload the final version of the modernized courses (Figure 6). Due date for this task was February the 1st 2024 (M14, February 2024).

Figure 6 - SmartWB Moodle Platform: Courses to modernize Final Version Folder

WP3-Capacity building of WB HEIs

- WP3-Capacity building of WB HEIs
 - 🛚 🛑 🛛 Task 3.1 Modernization of University Courses in collaboration with industry sector. TL Miguel Blanco-Callejo
 - Course Proposals for Courses to Modernize
 - 🔨 🛑 COURSE TO MODERNIZE FINAL VERSION
 - 🕨 🚞 🛛 01. UOM
 - 🕨 🚞 🛛 08. UNSA
 - 🕨 🛑 09. UNMO
 - 🕨 🚞 🛛 10. UNBI
 - 🕨 🚞 🛛 11. UET
 - 🕨 🚞 🛛 12. UPT
 - 🕨 🚞 🛛 13. U_POLIS
 - COURSES TO MODERNIZE FIRST DRAFT
 - 📁 🔲 COURSES TO MODERNIZE SECOND DRAFT
 - 🛚 🛑 Table Allocating Courses to EU and non associated partners
 - T3.1 WB Courses_13-06-2023.docx
 - TEMPLATES
 - 20230308_Template course proposal.docx
 - 20230928_Smart WB_WP3_Gantt.xlsx

2.2.10 Report D3.1 Writing:

Step 9. From February 2nd to March 11th, 2024

URJC assembles all the information regarding Task 3.1 and writes the Report on the modernization of university courses in collaboration with the non-academic sector.

2.2.11 Report D3.1 Review & Feedback:

Step 10. From March 11th to March 22nd, 2024

PMC and QAC provide feedback for the report.

All the documents resulting from all the different steps have been shared with all partner members in SmartWB's web page: www.smartwb.ucg.ac.me

2.2.12 Complementary Activities:

The following meetings and activities have taken place during the time that Task T3.1: Modernization of University Courses in collaboration with the industry sector has been developed.

Virtual Meeting: September 20th, 2023 (11 am to 13 pm)

After the summer break, a meeting was called to clarify the different steps to achieve course modernization as well as to present a Gantt Diagram with a detailed plan with dates for the final steps of the course's modernization (Figure 7).





Virtual Meeting: November 25th, 2023 (9 am-10 am)

This meeting was called to clarify aspects related to second modernization of courses draft.

International Seminar: November 29th, 2023 (9.30 am - 13.30 pm)

An international seminar, Smart urban development from climate sustainability based on ecological and energy efficiency (from 9.30 to 13.30), was held on 29th November 2029 at the URJC online to present main results of WP2, so that partners could better understand the precedents of the modernization of



courses and consider them in the modernization process (https://tv.urjc.es/video/65770f85f8ceb79582393562)..

Madrid Training Sessions: 12th – 14th December 2023

In the Madrid training activities (12th-14th December 2023), WB partners have received training oriented to the modernization of courses (tools, methodologies for innovating the courses).

The following Table (Table 8) summarizes the different steps considered in the methodology to propose final modernized courses including deadlines and partner involved in each one of the steps.

Steps	Tasks	Partners Involved	Deadlines
Step 1	Confirmation of the identification of list of courses to be modernized	URJC, UoM	8 th February-10 th March, 2023
Step 2	Proposed modernized course template in accordance with the European Higher Education Area	URJC, UoM, BOKU, NMBU, UNI, UNIZG, THOWL	February 11 th -8 th March, 2023
Step 3	Collecting the feedback from WBs Universities aspects to modernize and the feedback from non-academic partners in each WB country	OZON, ACE BH, Co- Plan, URJC, UET, UNMO, UNSA, UoM, U_POLIS, UPT	9 th March-23rd th May, 2023
Step 4	Allocation of courses to be modernized according to the expertise of the EU partners	BOKU, NIS, NMBU, UNIZG, URJC, THOWL	24th May-9th July, 2023
Step 5	Establishing of a benchmark of course modernized	NMBU, UNSA, THOWL	6 th June-4 th July, 2023
Step 6	First modernized draft for each course	All partners	5 th July 2023-15 th September, 2023
Step 7	Second modernized draft for each course	All partners	16 th September-12 th December, 2023
Step 8	Final modernized draft for each course	All partners	13 th December. 2023-1 st February, 2024
Step 9	Report on the modernization of university courses in collaboration with non- academic sector	URJC	2 nd February -11 th March, 2024
Step 10	Final check of D3.1. by PMC and QAC	All project partners	11 th -22 nd March, 2024

Table 8 - Steps followed for the proposal of modernized courses

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3. Courses modernized

The following sections of the report present the final version of the modernized courses for each one of the non-associated to the Programme partners HEIs. All the modernized courses have taken as starting point the original version of the courses in each one of the universities that were taught when the project started (M1, January 2023). Based on the aspects to be modernized proposed by the teaching staff involved in the courses in the Western Balkans' HEIs, the inputs provided by the professional associations, non-academic partners of each one of the countries and, finally the contributions of the partners of the European Union and countries associated to the Programme, the modernized version of each course has been developed.

It is important to note that all the new and modernized aspects that have been included in this renovated version of the courses are highlighted in a different color – red – to facilitate the identification of the new elements as well as with the objective to respect the 10 or 20% threshold proposed for courses' modernization.

This section presents the modernized courses in the proposed Teaching Guide Format described before on Section 2 of the Report comprising for each one of the courses the following aspects:

- Course and teacher identifiers
- Course objectives, goals and learning outcomes
- Course content divided into separated topics
- Teaching materials required and recommended
- Teaching strategies, techniques, and methods
- Student performance assessments and evaluation criteria and grading.

3.1 University of Montenegro

University of Montenegro modernization proposal consists of seven courses (Table 9)

No/Partner	Course na	me (ECTS)	Level of study	% of the modernized Courses compared to content included in the course	Number of students to be accepted in the first year	Category	EU & associated partners involved in providing support to modernize WB HEIIs courses
	01.	Building materials (7)	Bachelor (240 ECTS)	< 10%	100	Architecture and building design	UNI
	02.	Communal Infrastructure (3)	Bachelor (240 ECTS)	< 10%	50	Urban water management	THOWL, NMBU, BOKU
	03.	Elements of buildings (6)	Bachelor (240 ECTS)	< 10%	100	Architecture and building design	UNI
01/UoM	04.	Hydrotechnical Meliorations	Master (120 ECTS)	< 10%	8	Urban water management	THOWL & NMBU
	05.	Introduction to Civil Engineering (3)	Bachelor (240 ECTS)	< 10%	100	Architecture and building design	UNI
	06.	Maintaining, Sanitation and Reconstruction of Buildings (5)	Master (120 ECTS)	< 10%	15	Architecture and building design	UNI



		Master			Spatial and urban	BOKU
07.	Urban planning basics (5)	(120 ECTS)	< 10%	5	planning	

3.1.1 Building Materials

BUILDING MATERIALS		
Туре	Compulsory	
Teaching period	Bachelor course, 3rd semester	
ECTS credits	7	
Language	MNE	
II. Presentation		
The Course Building Materials is the science dealing with the composition and the structure of the materials, as well as their properties and behaviour and selection of the suitable materials for particular project. The main objective of this course & subject is to help students gain basic knowledge about building materials and provide the required skills to use them in structures according to their properties. The basic concern of a civil engineer is the design, construction, supervision and maintenance of different types of structures such as buildings, bridges, roads, canals, tube well, water tanks, etc. The key element in field practice is to deal with different field materials which are used for construction that helps in detailed specification, selecting of the materials, storage, sampling and testing. Therefore, a study of those aspects of materials and their applications in construction is very important.		
III. Competences		
Generic competencies		
 O1. Ability to present one's own points of view and analyse an O2. Ability to verify and integrate up-to-date knowledge in the O3. Ability to creatively apply knowledge in the use of building O4. Students apply their acquired knowledge and problem-solvemultidisciplinary) contexts related to the area of building response to th	d evaluate alternatives in the building materials sector. field of building materials. materials. ving skills in new or unfamiliar environments within broader (or materials.	
Specific competences		
 01. Know how to identify the needs and demands of the conteclerant to propose appropriate solutions for the research qui materials. 02. Develop reaconing and critical thinking to perform analysis 	exts in which the application of methodological tools is required and iestions that emanate from the lines derived from the scope of building	
 diagnosis of current building materials problems close to the building materials, which organisations use for their own of 03. 	he environment in which the student is using the tools provided by liagnosis.	
IV Contents		
IV A. Svilabus		
Chapter 1 INTRODUCTION		
 1.1. Atomic and molecular structure of materials and states of m 1.2. The structure of solid materials, crystalline structure 1.3. Disperse systems and solutions Practice 1. Atomic and molecular structure of materials 	natter	
Chapter 2. THE BASIC PROPERTIES OF CONSTRUCTION MATERIA 2.1. Physical properties 2.2. Hydro-physical properties	ALS, STATE PARAMETERS	
2.3. Thermo-technical properties		
2.4. Other Important physical properties Practice 2. State parameters; Thermal conductivity testing for de	etermination the characteristics of construction materials	
Chapter 3. PHYSICAL-MECHANICAL PROPERTIES		
3.1. Deformation characteristics		
3.3. Strength under dynamic loads Practice 3. Physical and mechanical properties		
Chapter 4. MATERIAL CHARACTERISTICS 4.1. Constructional, technological and exploitation characteristic 4.2. Rheological and chemical properties 4.3. Green construction materials and technologies Practice 4. Constructional, technological, eco-friendly and rheological	cs of the material ogical characteristics of the material	
Chapter 5. MATERIAL TESTING 5.1. Test methods 5.2. Defining the characteristics of materials 5.3. The application of mathematical methods for processing test Practice 5. Test methods	st results.	
Chapter 6. CONSTRUCTION STONE 6.1. Basic properties 6.2. Application Practice 6. Testing of physical and mechanical stone properties; resistance of natural stone products	Abrasion testing according to Bohme, for determining the abrasion	

Report on modernization of university courses in collaboration with industry sector



Chapter 7. CERAMIC MATERIALS 7.1. Ceramic materials, production. and their products 7.2. Properties and test methods of ceramic materials 7.3. Ceramic materials products Practice 7. Test methods for determination of ceramic materials properties					
Chapter 8. AGGREGATE 8.1. Grain size distribution and other properties of the granulate. Practice 8. Testing of aggregate properties					
Chapter 9. MINERAL (INORGANIC) BINDERS 9.1. Construction gypsum, lime, magnesia cement, pozzolana, cement, basic properties 9.2. Classes of quality and applications Practice 9. Testing of cement properties					
Chapter 10. MORTAR AND OTHER COMPOSIT Practice 10. Testing of mortar properties	ES				
Chapter 11. CONCRETE 11.1. Structure of fresh and hardened concret 11.2. The basic characteristics of concrete 11.3. Testing of certain properties of concrete Practice 11. Testing the fresh and hardened co	e and concrete product oncrete; Test method f	s for the freeze-thaw	v resistance of concrete		
Chapter 12. THE MATERIALS OBTAINED BY PR 12.1. Testing of basic physical-mechanical pro 12.2. Other metals Practice 12. Testing of steel properties	OCESSING ORE, IRON / perties	AND STEEL			
Chapter 13. THE MATERIALS OF ORGANIC ORI 13.1. Wood and wood-based materials 13.2. Durability and protection Practice 13. Testing of wood properties	GIN				
Chapter 14. HYDROCARBON BINDERS 14.1. Bitumen and tar 14.2. Polymers and plastics 14.3. New materials for particular use Practice 14. New materials					
Chapter 15. THE CLIMATE-SMART CONSTRUC 15.1. Zero waste design 15.2. Circular economy in construction	ΓΙΟΝ				
Practice 15. Green construction					
IV.B. Training activities					
Туре		Description			
Reading		-			
Practical / Problem solving		Real-case analysis (Case-Study) and problem-solving			
Other		-			
V. Student workload (nours)		43			
Practical classes (problem-solving, case studie	s etc	42			
Practical sessions in technological laboratorie	s hospitals etc	0			
Tests		8			
Academic tutorials		14			
Related activities: conferences, seminars, etc.		-			
Preparation of lecture classes		50			
Preparation of practical classes, problem-solv	ing, case studies,etc.	26			
Test preparation		30			
Total student workload		210			
VI. Methodology and academic program					
Туре	Period		Content		
Theoretical Classes	Week 1 to Week 15		Lectures		
Practical Classes	Week 1 to Week 15		Practice resolution, cases, research discussions/laboratory/simulations		
Seminars & exam	Week 16 to Week 21		Exam		
VII. Assessment methods					
VII.A. Assessment weighting					
Continuous ordinary assossment:					

Continuous ordinary assessment:



The distribution and characteristics of the assessment tests are described below. Only in the exceptional case and for special reasons may the teacher change the Guide. These changes will require the prior consultation with the Course Head and the prior and explicit authorisation of the Degree Program Coordinator, who will notify the Vice-rector's office in charge of Academic Affairs of the modifications made. In any case, the proposed changes must consider the verified report's stipulations. For these changes to take effect, they must be duly communicated at the start of the course to the students using Aula Virtual.

The combination of activities that are not re-assessable cannot exceed 50% of the Course grade and, in general, cannot have a minimum grade (except for the case of laboratory or clinical work placements, where duly justified) and tests which exceed 60% of the Course weighting cannot be added.

Extraordinary assessment: Students who do not manage to pass the ordinary assessment or who did not attend will be subject to completion of an extraordinary assessment to verify their acquisition of the skills established in the guide, only for activities that are reassessable.

Description of the tests for assessment and their weights

A final exam will take place at the end of the seminar. The exam will be 49% of the final grade; the rest, 51%, comes from continuous evaluation. The exam will take place in a physical class. If the situation does not allow it, the exam will be online.

VII.B. Assessment of students with an academic exemption

A student who wishes to opt for this assessment will have to get an academic exemption for the Course, which they will have to request from the Dean or Director of the Centre which teaches their course. An academic exemption may be granted where the Courses own characteristics allow for it.

Course with the possibility of an exemption: Yes

VII.C. Review of assessment tests

In accordance with the exam appeal regulations of the University of Montenegro

VII.D.-Students with a disability or special educational needs

Curricular adaptations for students with a disability or special educational needs will be determined by the Disabled Students Support Department in accordance with the regulations governing the Disabled Students Support service, approved by the University of Montenegro to guarantee equal opportunities, inclusive treatment, universal accessibility and a more outstanding guarantee of academic success.

For this purpose, this Department will have to issue a curricular adaptation report. Therefore, students with disabilities or special educational needs must contact the Department to analyse the alternatives.

VII.E.-Academic behaviour, academic integrity, and honesty

The University of Montenegro is completely committed to the highest academic integrity and honesty standards. Therefore, studying at the University of Montenegro means you accept and agree to the academic integrity and honesty values described in the University's Code of Ethics. To monitor this procedure, the University has Regulations on the academic behaviour at the University of Montenegro. It uses different tools (anti-plagiarism, supervision) that collectively ensure these essential values are completely developed.

VII. Bibliography

Generic References

Mihailo Muravljov: Building materials, Građevinska knjiga, Beograd 2000

Specific References

R. Bannon-Godfrey et al.: Climate Change and the Built Environment, ACEC 2022

X. Wang, S. Ramakrishnan: Environmental Sustainability in Building Design and Construction, Springer 2021

J. Marchand, M. Pigeon, M.J. Setzer: Freeze-Thaw Durability of Concrete, CRC Press Florida 2019

IX.Lecturers/Teachers/Professors	
Lecturer/teacher/professor's name	Radomir Zejak
E-mail address	<u>rzejak@t-com.me</u>
Area	Civil Engineering – Materials and Constructions
Link	https://www.ucg.ac.me/radnik/160139-radomir-zejak

3.1.2 Communal Infrastructure

COMMUNAL INFRASTRUCTURE			
Туре	Mandatory		
Teaching Period	Bachelor course, 6th semester		
ECTS credits	3		
Language	MNE		
II. Presentation			
The main objective of this course & subject consists of helping students to understand the basic elements of communal infrastructure			
systems, the role of infrastructure in the development of the city, and the general principles of planning and financing communal			
infrastructure.			
III. Competences			
Generic Competencies			
01. Ability to present one's own points of view and analyse and evaluate alternatives in communal infrastructure systems.			

02. Ability to verify and integrate up-to-date knowledge in the field of communal infrastructure systems



03. Ability to apply knowledge to communal infrastructure systems creatively.			
Students apply their acquired knowledge and problem-solving skills in new or unfamiliar environments within broader (or multidisciplinany) contexts related to the area of communal infracts students and the second students area of communal infracts students area of communal infracts and the second students area of communal infracts areas			
Specific competences			
01 Know how to identify the needs and demar	nds of the contexts	in which the application (of methodological tools is required and
learn to propose appropriate solutions for t	he research questi	ons that emanate from th	e lines derived from the scope of
communal infrastructure systems.	de l'escal en questa		
02. Develop reasoning and critical thinking to p	erform analysis of	communal infrastructure	systems reality through identification.
description and diagnosis of current commu	unal infrastructure	systems problems close to	the environment in which the student is
using the tools provided by communal infra	structure systems a	and that organisations use	e for their own diagnosis.
03. Propose appropriate solutions based on the	communal infrast	ructure systems studied.	-
04. Knowledge of the "sponge city" and "blue-g	reen-grey infrastru	icture" principles	
IV. Contents			
VI.A. Syllabus			
Chapter 1. TRAFFIC AND HYDRAULIC ENGINEERII	NG		
1.1. Concept and definitions, classification of Infra	astructure		
1.2 Basic terms and characteristics of the traffic, t	traffic in cities, road	d and street network	
Chapter2. HYDRAULIC ENGINEERING			
2.1 Water supply to the settlement			
2.2 Stormwater management of the settlement			
2.3 Wastewater management of the settlement			
2.5 Flood protection of settlements			
Chapter 3 FIECTRICAL ENERGY AND HEATING			
3.1. Electric power systems in cities			
3.2 Telecommunication systems			
3.3 District heating system of cities			
Chapter 4. WASTE			
4.1 Municipal solid waste management collection	and transport syst	tems.	
4.2 Strategies for waste recycling			
Chapter 5. GREEN INFRASTRUCTURE			
4.1 Systems of green areas in the city.			
4.2 Blue-green-grey infrastructure in the cities			
4.3 Demand for interactions between disciplines in urban conditions			
IV.B. Training Activities			
Туре		Description	
Reading		Reading of Articles	
Practical / Problem solving		No practical activities	
Other		Seminars from industry	experts
V. Student workload (hours)			
Lecture Classes		26	
Practical classes/problem-solving, case studies, et	tc.	0	
Practical sessions in technological laboratories, hospitals, etc.		0	
Tests		4	
Academic Tutorials		13	
Related Activities: conferences, seminars, etc.		-	
Preparation of lecture classes		30	
Preparation of practical classes, problem-solving,	case studies,	13	
etc.			
Test Preparation 4			
Total student workload 90			
VI. Methodology and academic program			
Type	Period		Content
Ineoretical Classes	Week 21 to Wee	K 35	Lectures
Practical Classes	-		-
Exam	Exam Week 36 to Week 40 Seminars and exam		Seminars and exam
VII. Assessment methods			
VII.A. Assessment weighting			

Continuous ordinary assessment:

The distribution and characteristics of the assessment tests are described below. The teacher may change the Guide only in the exceptional case and for special reasons. These changes will require the prior consultation with the Course Head and the prior and explicit authorisation of the Degree Program Coordinator, who will notify the Vice-rector's office in charge of Academic Affairs of the modifications made. In any case, the proposed changes must consider the verified report's stipulations. For these changes to take effect, they must be duly communicated at the start of the course to the students using Aula Virtual.

The combination of activities that are not re-assessable cannot exceed 50% of the course grade and, in general, cannot have a minimum rate (except for the case of laboratory or clinical work placements, where duly justified), and tests which exceed 60% of the course weighting cannot be added.





Extraordinary assessment: Students who do not manage to pass the ordinary evaluation or who did not attend will be subject to completion of an extraordinary evaluation to verify their acquisition of the skills established in the guide, only for activities that are reassessable.

Description of the tests for assessment and their weights

A final exam will take place at the end of the seminar. The exam will be 90% of the final grade, and the rest 10% comes from continuous evaluation. The exam will take place in a physical class. Only if the situation at the moment does not allow it, the exam will be online. VII.B. Assessment of students with an academic exemption

Students who wish to opt for this assessment will have to get an academic exemption for the course, which they will have to request from the Dean or Director of the Centre, which teaches their course. An educational exemption may be granted where the course's own characteristics allow for it.

Course with the possibility of an exemption: Yes

VII.C. Review of assessment tests

In accordance with the exam appeal regulations of the University of Montenegro

VII.D.-Students with a disability or special educational needs

Curricular adaptations for students with a disability or special educational needs will be determined by the Disabled Students Support Department in accordance with the regulations governing the Disabled Students Support service, approved by the University of Montenegro to guarantee equal opportunities, inclusive treatment, universal accessibility and a more excellent guarantee of academic success.

For this purpose, this Department will have to issue a curricular adaptation report. Therefore, students with disabilities or special educational needs must contact the Department to analyse the alternatives.

VII.E.-Academic behaviour, academic integrity, and honesty

The University of Montenegro is wholly committed to the highest academic integrity and honesty standards. Therefore, studying at the University of Montenegro means you accept and agree to the academic integrity and honesty values described in the University's Code of Ethics. To monitor this procedure, the University has Regulations on the academic behaviour at the University of Montenegro. It uses different tools (anti-plagiarism, supervision) to ensure these essential values are entirely developed.

VII. Bibliography

Generic References

1. Đurđević, M.: Communal infrastructure, Belgrade, 2007

2.Jahić, M.: Communal infrastructure, Sarajevo, 2007

Specific References

Sekulic. G., Ćipranić, I., Communal hydrotechnics, Faculty of Civil Engineering, Podgorica, 2015.		
IX.Lecturers/Teachers/Professors		
Lecturer/teacher/professor's name	Goran Sekulić	
E-mail address	sgoran2000@gmail.com	
Area	Civil Engineering – Water Engineering	
link	https://www.ucg.ac.me/radnik/160315-goran-sekulic	

3.1.3 Elements of building

ELEMENTS OF BUILDINGS		
Туре	Compulsory	
Teaching period	Bachelor course, 2nd semester	
ECTS credits	6	
Language	MNE	
II. Presentation		
The main objective of this course & subject is to help students I	earn about basic constructive systems, assemblies and building elements	
related to building stability, space partitioning, vertical commun	nication, and insulation in the building. The student will be able to devise	
a solution for a particular constructive assembly/subsystem of t	he building's physical structure, led by the learned constructing principles	
and forming the composition of building elements applying bas	ic building materials.	
III. Competences		
Generic competencies		
01. Ability to present one's own points of view and analyse ar	d evaluate alternatives in building elements composition.	
02. Ability to verify and integrate up-to-date knowledge in the	e field of building elements.	
03. Ability to apply knowledge to building elements creatively.		
04. Students apply their acquired knowledge and problem-solving skills in new or unfamiliar environments within broader (or		
multidisciplinary) contexts related to the area of building elements.		
Specific competences		
01. Know how to identify the needs and demands of the contexts in which the application of methodological tools is required and		
learn to propose appropriate solutions for the research questions that emanate from the lines derived from the scope of building		
elements.		
02. Develop reasoning and critical thinking to perform analysis of building elements reality through identification, description and		
diagnosis of current building elements composition problems close to the environment in which the student is using the tools		
provided by building elements and that organisations use for their own diagnosis.		
03. Propose appropriate solutions based on the building elements studied.		
IV. Contents		
VI.A. Syllabus		
Chapter 1. Introduction		
1.1. Building concepts		



 1.2. Constructive systems 1.3. Project development Practice 1. Constructive systems and constructive assemblies 		
Chapter 2. Foundation 2.1. Basic types and characteristics of soil 2.2. Types of foundations Practice 2. Foundation base and characteristic details		
Chapter 3. Waterproofing: Insulation from underground moisture ar 3.1. Insulation from underground moisture 3.2. Insulation from underground water Practice 3. Characteristic foundation details with horizontal and vert	nd underground water ical insulation	
Chapter 4. Vertical structural elements/assemblies 4.1. Masonry walls 4.2. Monolithic vertical elements 4.3. Chimneys in buildings Practice 4. Masonry walls: the base of a typical floor with a representation of masonry layers and characteristic details of the foundation		
Chapter 5. Horizontal structural elements/assemblies 5.1. Massive structures 5.2. Wooden structures Practice 5. Types of massive structures		
 Chapter 6. Floor and ceiling constructions, sound insulation aspects 6.1. Floor constructions – characteristics and types 6.2. Ceiling constructions – characteristics and types Practice 6. Significant floor and ceiling constructions in terms of sound insulation 		
Chapter 7. Openings in the walls - doors and windows 7.1. Door openings 7.2. Window openings Practice 7. Door and window openings – characteristic dimensions		
Chapter 8. Vertical communications in buildings 8.1. Ramps 8.2. Stairs – internal and external 8.3. Elevators Practice 8. Construction of reinforced concrete (RC) staircase		
Chapter 9. Roofs. roof structures and coverings 9.1. Pitched roofs - roof constructions: rafter roofs, purlin roofs 9.2. Pitched roofs - roof constructions: roofs on trussed beams, lattice roof trusses; 9.3. Flat roofs Flat roofs: drainage method, construction composition, finishes and penetrations 9.4. Roof coverings: from baked clay, from different types of materials Practice 9. Construction of pitched and flat roofs		
Chapter 10. Thermal insulation and external building constructions Practice 10.1. Installation of thermal insulation on building elements Practice 10.2. Thermal conductivity testing of thermal insulation		
Chapter 11. Building energy efficiency 11.1. Sustainable design principles for green buildings 11.2. Building energy efficiency and passive house design 11.3. Renewable energy systems and net-zero energy buildings Practice 11. Possibilities for creating climate-smart buildings		
IV.B. Training activities	Description	
Reading	-	
Practical / Problem solving	Real-case analysis (Case-Study) and problem-solving	
Other V. Student workload (hours)	-	
v. suuent workioau (nours) Lecture classes	39	
Practical classes/problem-solving, case studies, etc.	28	
Practical sessions in technological laboratories, hospitals, etc.	0	
Tests	8	
Academic tutorials 14		
Preparation of lecture classes 50		
Preparation of practical classes, problem-solving, case studies, etc.	14	
Test preparation	27	



Total student workload	180			
VI. Methodology and academic program				
	Period	Content		
Theoretical Classes	Week 21 to Week 35			
Practical Classes	Week 21 to Week 35	Practice resolution		
Seminars & exam	Week 36 to Week 40	Exam		
VII. Assessment methods				
VII.A. Assessment weighting				
Continuous ordinary assessment:				
The distribution and characteristics of the assessment	nent tests are described below. On	ly in the exceptional case and for special reasons may		
the teacher change the Guide. These changes	will require the prior consultation	with the Course Head and the prior and explicit		
authorisation of the Degree Program Coordina	ator, who will notify the Vice-re	ctor's office in charge of Academic Affairs of the		
modifications made. In any case, the proposed ch	anges must consider the verified r	eport's stipulations. For these changes to take effect,		
they must be duly communicated at the start of t	he course to the students using Au	la Virtual.		
The combination of activities that are not re-asse	ssable cannot exceed 50% of the c	ourse grade and, in general, cannot have a minimum		
grade (except for the case of laboratory or clinic	cal work placements, where duly	ustified) and tests which exceed 60% of the course		
weighting cannot be added.				
Extraordinary assessment: Students who do no	t manage to pass the ordinary as	sessment or who did not attend will be subject to		
completion of an extraordinary assessment to ver	ify their acquisition of the skills est	ablished in the guide, only for re-assessable activities.		
Description of the tests for assessment and their	r weights			
A final exam will take place at the end of the semi	nar. The exam will be 50% of the fi	nal grade; the remaining 50% comes from continuous		
evaluation. The exam will take place in a physical	class. Only if the situation at the n	noment does not allow it the exam will be online.		
VII.B. Assessment of students with an academic	exemption			
A student who wishes to opt for this assessment	will have to get an academic exem	ption for the course, which they will have to request		
from the Dean or Director of the Centre which t	eaches their course. An academic	exemption may be granted where the course's own		
characteristics allow for it.				
Course with the possibility of an exemption: Yes				
VII.C. Review of assessment tests	6.1			
In accordance with the exam appeal regulations of	of the University of Montenegro			
VII.DStudents with a disability or special educa	tional needs			
Curricular adaptations for students with a disabi	lity or special educational needs w	fill be determined by the Disabled Students Support		
Department in accordance with the regulation	s governing the Disabled Studen	sibility and a greater guarantee of academic success		
For this purpose, this Department will have to	issue a curricular adaptation rop	ort. Therefore, students with disabilities or special		
educational needs must contact the Department	to analyse the alternatives	ort. Therefore, students with disabilities of special		
VII E -Academic behaviour academic integrity a	ind honesty			
VII.EAcademic benaviour, academic integrity, and nonesty				
the University of Montenegro means you accent and agree to the academic integrity and honesty values described in the University's				
Code of Ethics. To monitor this procedure, the Ur	niversity has Regulations on the acc	idemic behaviour at the University of Montenegro. It		
uses different tools (anti-plagiarism, supervision) that collectively ensure these essential values are entirely developed.				
VII. Bibliography				
Generic References				
01. Božidar Đ. Milić: "Building elements and constructions". Faculty of Civil Engineering. Podgorica, 1999.				
 Declad D. Wine: Denoning clements and constructions , receipt of even engineering, rougoned, 1995. Žorž Popović: "Building constructions". Naučna knjiga, Beograd, 1987. (and newer editions) 				
03. Petar K. Krstić: "Architectural structures" 1 & 2. Naučna knjiga. Beograd. 1984.				
Specific References				
04 Duro Peulié: "Structural elements of buildings" I & II part Tehnička knjiga Zagreb 1980				
05. Dušan Smiljanić: "Architectural structures I (1,8 ll part) and II (1,8 ll part). University of Sarajevo. 1967				
06. Keeping M, Shiers D: Sustainable Building Design: Principles and Practice, John Wiley And Sons Ltd, 2017				
07. Reeder L: Net Zero Energy Building, Routledge, New York, 2016				
IX.Lecturers/Teachers/Professors				
Lecturer/teacher/professor's name Nataša Kopitović Vuković				
E-mail address	nataly@ucg.ac.ı	ne		
Area	Civil Engineering	g – Materials and Constructions		
Link https://www.ucg.ac.me/radnik/160399-natasa-kopitovic				
2.1.4.U.destaskaisel Malianeticas				

HYDROTECHNICAL MELIORATIONS Type Compulsory Teaching period Master course, 3rd semester ECTS credits 5 Language MNE II. Presentation The main objective of this course is to introduce the principles of designing and building meliorations systems. III. Competences Generic competencies



01. Students apply their acquired knowledge and problem-solving skills to engineering problems in the field of drainage and irrigation			
system.			
02. Ability to apply knowledge to designing and building meliorations systems.			
Specific competences			
1 Know the basic principles in calcula	ting drainage and	irrigation system	
2 Have an insight into the specifics of	the drainage and	irrigation system.	
3. Know the concepts of the design of	the meliorations	systems.	
IV. Contents		1	
VI.A. Syllabus			
Chapter 1. Introduction to the hydrotechnical m	elioration		
1.1 Water management problems of irrigation	and drainage.		
1.2 Necessary conditions for the operation of ir	rigation and drain	age systems and environm	iental problems.
1.3 Irrigation and drainage conditions.			
1.4 Parameters for determining reference evap	otranspiration.		
Chanter 2 Soil			
2.1 Quality demands on irrigation water			
2.2 Characteristics of the soil			
2.3 Chemical properties of soil, biological activi	ties in soil, soil cla	ssification	
2.4 Basic characteristics of water flow in soil.			
2.5 Soil permeability and infiltration test metho	ods		
Chapter 3. Irrigation regime			
3.1. Characteristics of the soil.		1	
3.2. Chemical properties of soil, biological a	ctivities in soil, soi	l classification.	
5.5. Basic characteristics of water now in sc	····.		
Chapter 4. Drainage regime			
4.1 Methods of water drainage			
4.2 Calculations of drainage systems			
4.3 Irrigation and drainage system design			
		-	
IV.B. Training activities			
Туре	Type Description		
Reading Reading of Articles			
Practical/Problem solving	Practical/Problem solving Irrigation and drainage system design		
Other		-	
V. Student Workload (nours)		105	
Lecture classes	+c	7	
Practical classes/problem-solving, case studies, e	osnitals etc		
Tests	ospitals, etc.	3	
Academic tutorials		5	
Related activities: conferences, seminars, etc.		2	
Preparation of lecture classes		6	
Preparation of practical classes, problem-solving, case studies.			
etc.	etc. 4		
Test preparation 18			
Total student workload	-	150	
VI. Methodology and academic program			
Type Period Content			
Theoretical Classes	eoretical Classes Week 1 to Week 14 Lectures		Lectures
Practical Classes	actical Classes Week 15 Construction site visit		Construction site visit
Seminars & exam	Week 16-20		Seminars and exam
VII. Assessment methods			
VII.A. Assessment weighting			
The distribution and characteristics of the assess	mont tosts are des	cribed below. The teacher	may change the Guide only in the
eventional case and for narticular reasons. These changes will require the prior consultation with the Course Head and the prior and			
explicit authorisation of the Degree Program Coordinator, who will notify the Vice-rector's office in charge of Academic Affairs of the			
modifications made. In any case, the proposed changes must consider the verified report's stipulations. For these changes to take			
effect, they must be duly communicated to the students at the start of the course.			

Extraordinary assessment: NO

Description of the tests for assessment and their weights

A final exam will take place at the end of the seminar. The exam will be 50% of the final grade, and the rest 50% comes from continuous evaluation. The exam will take place in a physical class. If the situation does not allow it, the exam will be online. VII.B. Assessment of students with an academic exemption



Course with the possibility of an exemption: No		
VII.C. Review of assessment tests		
In accordance with the exam appeal regulations of the	e University of Montenegro	
VII.DStudents with a disability or special educationa	al needs	
VII.EAcademic behaviour, academic integrity, and h	onesty	
The University of Montenegro is wholly committed to	the highest academic integrity and honesty standards. Therefore, studying at the	
University of Montenegro means you accept and agree	e to the academic integrity and honesty values described in the University's Code	
of Ethics. To monitor this procedure, the University ha	s Regulations on academic behaviour at the University of Montenegro and uses	
different tools (anti-plagiarism, supervision) which pro	ovide a collective assurance that these essential values are completely developed	
VII. Bibliography		
Generic References		
D. Avakumović: Elementi navodnjavanja I ovodnjavanja, Građevinski fakultet, Beograd, 2005.		
D. Avakumović: Navodnjavanja, Građevinski fakultet, Beograd, 2005.		
D. Avakumović: Odvodnjavanje, Građevinski fakultet, I	Beograd, 2005.	
Specific References		
IX.Lecturers/Teachers/Professors		
Lecturer/teacher/professor's name	Sreten Tomović	
E-mail address	sreten.t09@hotmail.com	
Area	Civil engineering - general disciplines	
Link	https://www.ucg.ac.me/radnik/165512-sreten-tomovic	
3.1.5 Introduction to Civil Engineering		
Course & Subject identification		
INTRODUCTION TO CIVIL ENGINEERING		
Туре	Compulsory	
Teaching period	Bachelor course, 2nd semester	

Gen	eric co	ompetencies
	1.	Ability to present one's own points of view on the greatest achievements in t

- 1. Ability to present one's own points of view on the greatest achievements in the history of civil engineering.
- 2. Ability to verify and integrate up-to-date knowledge in the field of civil engineering.
- 3. Ability to apply the acquired knowledge in further education in civil engineering or within broader (or multidisciplinary) contexts related to the area of civil engineering.

3

The main objective of this course is to introduce the most important areas of civil engineering to students and provide them with knowledge about basic concepts in construction and architecture. The students will get an overview of the history of construction, why architecture and civil engineering used to be one discipline and why they are now considered separately. In addition, modern concepts such as circular economy, smart construction and green buildings are explored. Practical aspects in the profession of a civil engineer are

presented and discussed. Various disciplines of civil engineering, such as structural, geotechnical, hydraulic, environmental, transportation and construction engineering are elaborated. The students will also have the opportunity to experience the real-life

Montenegrin

Specific competences

III. Competences

ECTS credits

Language II. Presentation

After passing the exam, students will:

- 1. Know the basic principles in construction and architecture and features of materials and be prepared to listen to courses in the coming semesters;
 - 2. Have an insight into the specifics of the profession of civil engineering and various fields of construction, as well as modern concepts in construction;
 - 3. Know the basics of the history of construction, as well as the most influential authors and their facilities;

4. Know the basic concepts in constructing bridges, buildings, and roads, then hydraulic and geotechnics and project management.

IV. Contents

VI.A. Syllabus

Chapter 1. Introduction to the civil engineering

work of a civil engineer by visit to construction sites.

- 1.1. Basic concepts in construction and architecture.
- 1.2. Selected examples of top construction skills.
- 1.3. About the profession and ethics of a civil engineer
- 1.4. Building materials with the emphasis on environmentally responsible materials

1.5. Circular Economy in Construction

- 1.6. Construction and Urban Development
- Chapter 2. History of construction and architecture

2.1. Construction in Prehistory

- 2.2. Architecture, cities and canals of Mesopotamia
- 2.3. Egyptian temples and tombs
- 2.4. Cretan Mycenaean culture
- 2.5. Rome and the engineers of antiquity
- 2.6. Architecture of Byzantium and Romanesque



2.7. Vaults and supports of Gothic cathedrals					
2.8. Renaissance architecture, fortifications and cities. Baroque.					
2.9. Industrial Revolution. Great engineers and ar	chitects of the XX (Century. Bauhaus. Roads,	railways and hydraulic constructions of		
the XX Century					
2.10. The use of traditional materials in the eco-c	onstruction concep	ot			
Chapter 3. Civil engineering – practice					
3.1. Technical regulations, standards and norms i	n the field of const	ruction			
3.2. Technical documentation					
3.3. Participants in the process of realisation of p	rojects				
3.4. Smart buildings - examples					
Chapter 4. Introduction to the fields of civil engine	neering				
4.1. Typology of structures; construction element	s: beam, column, g	grid, arc, shell			
4.2. Tall buildings, basic principles of design and o	construction				
4.3. Bridges, basic construction systems and cons	truction methods				
4.4. Basic concepts of hydraulic engineering. Dam	is and hydraulic str	ructures,			
basic principles of design and construction					
4.5. Roads and railways					
4.6. Underground objects, basic principles of desi	gn and constructio	on. Basic			
concepts of geotechnics.					
4.7. Wooden constructions, basic principles of de	sign and constructi	ion _			
4.8. Construction project management, basic con	cepts and their imp	portance			
4.9. Building Energy Efficiency					
Practice: Visiting the construction site		T			
IV.B. Training activities		D			
Туре		Description	· · · · ·		
Writing seminal papers		Overview of principles of	t writing seminal papers		
Project based learning		Case studies, Constructi	on site visits, Analysis of existing buildings		
		and structures			
Other		-			
V. Student workload (hours)					
Lecture classes		64			
Practical classes/problem-solving, case studies, et	tc.	4			
Practical sessions in technological laboratories, he	ospitals, etc.	2			
Tests		2			
Academic tutorials		-			
Related activities: conferences, seminars, etc.		-			
Preparation of lecture classes		-			
Preparation of practical classes, problem-solving,	case studies, etc.	-			
Test preparation		18			
Total student workload		90			
VI. Methodology and academic program					
Туре	Period		Content		
Theoretical Classes	Week 1 to Week	12	Lectures		
Practical Classes	Week 13		Construction site visit		
Seminars & exam	Week 14-16		Seminars and exam		
VII. Assessment methods					
VII.A. Assessment weighting					
Continuous ordinary assessment:					
The distribution and characteristics of the assessment tests are those described below. Only in exceptional case and for special reasons					
may the teacher add changes to the Guide. These changes will require the prior consultation with the Course Head and the prior and					
explicit authorization of the Degree Program Coordinator, who will notify the Vice-Rector's office in charge of Academic Affairs of the					
modifications made. In any case, the changes proposed must consider the stipulations of the verified report. For these changes to take					
effect, they must be duly communicated at the start of the course to the students.					
The combination of activities that are not re-assessable cannot exceed 50% of the course grade and, in general, cannot have a minimum					
grade, and tests which exceed 60% of the course	weighting cannot b	be added.			
Extraordinary assessment: NO					
Description of the tests for assessment and their weights					
A final exam that will be taking place at the end of the seminar. The exam will be a 50% of final grade, the rest 50% comes from the					
continuous evaluation. The exam will take place i			continuous evaluation. The exam will take place in physical class.		
continuous evaluation. The exam win take place	n physical class.				
VII.B. Assessment of students with an academic	n physical class. exemption				
VII.B. Assessment of students with an academic Course with the possibility of an exemption: No	n physical class. exemption				
VII.B. Assessment of students with an academic Course with the possibility of an exemption: No VII.C. Review of assessment tests	n physical class. exemption				
VII.B. Assessment of students with an academic Course with the possibility of an exemption: No VII.C. Review of assessment tests In accordance with the exam appeal regulations of	n physical class. exemption	Montenegro			
VII.B. Assessment of students with an academic Course with the possibility of an exemption: No VII.C. Review of assessment tests In accordance with the exam appeal regulations of VII.DStudents with a disability or special educa	n physical class. exemption of the University of tional needs	Montenegro			
VII.B. Assessment of students with an academic Course with the possibility of an exemption: No VII.C. Review of assessment tests In accordance with the exam appeal regulations of VII.DStudents with a disability or special educa VII.EAcademic behavior, academic integrity, an	n physical class. exemption of the University of tional needs id honesty	Montenegro			
VII.B. Assessment of students with an academic Course with the possibility of an exemption: No VII.C. Review of assessment tests In accordance with the exam appeal regulations of VII.DStudents with a disability or special educa VII.EAcademic behavior, academic integrity, an The University of Montenegro is completely completely completely of Montenegro is completely completely completely of Montenegro is completely complet	n physical class. exemption of the University of tional needs id honesty mitted to the higher the new set to the	Montenegro	integrity and honesty. Therefore, studying		



uses different tools (anti-plagiarism, supervision) which provides a collective assurance that these essential values are completely		
developed		
VII. Bibliography		
Generic References		
Likovna enciklopedija (Arhitektura); Leksikografski zavod, Zagreb		
Velike arhitekture svijeta, Mladost, Zagreb		
Aurelio Muttini: The art of structures: introduction to the functioning of structures in architecture, EPFL		
G. G. Schierle: Architectural Structures		
Specific References		
Danijels: Tehnologija ekološkog građenja		
Teaching materials prepared by professors of UoM related to specific fields of civil engineering		
IX.Lecturers/Teachers/Professors		
Lecturer/teacher/professor's name	Marija Jevrić	
E-mail address	marijaj@ucg.ac.me	
Area	Civil engineering - general disciplines	
Link https://www.ucg.ac.me/radnik/160429		

3.1.6 Maintaining, Retrofitting and Strengthening of structures (formerly, Maintaining, sanitation and reconstruction of buildings)

MAINTAINING, RETROFITTING AND STRENGTHENING OF STRUCTURES			
Туре	Mandatory		
Teaching Period	Master course, 3rd semester		
ECTS credits	5		
Language	MNE		
II. Presentation			
The main objective of this course & subject consists of helping	students to understand the maintenance, retrofitting and strengthening		
of structures. And provide the required skills to be prepared	to recognise basic causes of damage, apply principles, techniques and		
methods of rehabilitation, strengthen and maintain structures a	nd design strengthening and upgrading structural elements. Students are		
trained to independently perform the structure strengthening	and upgrading design and suggest the necessary maintenance measures		
in the monitoring and structure assessment process. Within thi	s course, the deterioration processes and reasons that lead to the need		
for rehabilitation and strengthening of structures, methods of d	lamage identification and quantification and basic concepts of durability		
and reliability are analyzed. Strengthening and structural upgrad	ding of Reinforced Concrete (RC), masonry, steel, composite, and timber		
structures, as well as seismic upgrading and strengthening of e	xisting structures, are studied. Also, new, and innovative approaches to		
rehabilitation and strengthening are included in the course cont	ent.		
III. Competences			
Generic Competencies			
01 Ability to present one's own points of view and analyse an	d evaluate alternatives in rehabilitation, strengthening and maintenance		
of structures			
02 Ability to verify and integrate up-to-date knowledge in the	field of rehabilitation strengthening and maintenance of structures		
03 Ability to apply knowledge to rehabilitation strengthening	and maintenance of structures creatively		
04 Students apply their acquired knowledge and problem	-solving skills in new or unfamiliar environments within broader (or		
multidisciplinary) contexts related to the area of rebabilita	tion strengthening and maintenance of structures		
Specific competences			
01 Know how to identify the needs and demands of the conte	xts in which the application of methodological tools is required and learn		
to propose appropriate solutions for the research question	ns that emanate from the lines derived from the scope of rehabilitation		
strengthening and maintenance of structures			
02. Develop reasoning and critical thinking to perform analys	is of rehabilitation, strengthening and maintenance of structures reality		
through identification, description and diagnosis of curren	t rehabilitation, strengthening and maintenance of structures problems		
close to the environment in which the student is using t	he tools provided by rehabilitation, strengthening and maintenance of		
structures, and that organisations use for their own diagno	osis.		
03. Propose appropriate solutions based on the studied structures' rehabilitation, strengthening and maintenance.			
IV. Contents			
VI.A. Svilabus			
Chapter 1. Introduction and definitions of the maintenance, reh	abilitation and strengthening of structures.		
1.1. Reasons that lead to the need for rehabilitation, strengthen	ing and maintenance of structures.		
1.2. Causes and forms of structures damage.			
1.3. Examples of damaged structures.			
Chapter 2. Classification of damage and causes.			
2.1. Damage due to fires, earthquakes, explosions, overloads, u	uneven settlement, moisture, biological influences, chemical influences,		
and mechanical influences.			
2.2. Methods and techniques of damage identification and quar	itification.		
Chapter 3. Basic concepts of durability and reliability.			
3.1. Design service life.			
3.2. Types of limit states from the aspect of durability.			
3.3. Design according to service life.			
3.4. Condition assessment.			
3.5. Sustainability.			
Chapter 4. Maintenance of structures and infrastructure - importance, basic concepts and principles.			
4.1. Maintenance design.			



4.2. Assessment and monitoring of the buildings and bridges. Chapter 5. Strengthening and rehabilitation of RC structures. 5.1. Structural upgrading of RC frame elements subjected to bending and shear. 5.2. Structural upgrading of RC wall and plate elements. 5.3. Strengthening the RC structure by modifying static system or loads state. 5.4. Strengthening and rehabilitation by prestressing. Chapter 6. Strengthening using composite materials. 6.1. Strengthening using FRP (Fiber-reinforced polymer) materials. 6.2. Strengthening using TRM (Textile-Reinforced Mortar) materials. Chapter 7. Rehabilitation and strengthening of masonry structures. 7.1. Methods, materials and rehabilitation techniques, structural upgrading and strengthening. 7.2. Rehabilitation and protection of cultural heritage structures. Chapter 8. Rehabilitation and strengthening of steel, composite and timber structures. 8.1. Methods, materials, and rehabilitation techniques, strengthening and structural upgrading. Chapter 9. Rehabilitation and strengthening of bridges. 9.1. Methods, materials, and rehabilitation techniques, strengthening and structural upgrading. Chapter 10. Seismic assessment of existing buildings. 10.1. Rehabilitation and structural strengthening of existing buildings to reduce the seismic vulnerability of the built environment. 10.2. Novel integrated techniques for the combined seismic strengthening and energy upgrading of existing buildings. Chapter 11. Rehabilitation and strengthening of structures on roads. 11.1. Methods, materials and techniques of rehabilitation, strengthening and retrofitting. Chapter 12. Rehabilitation and strengthening of hydro-technical structures. 12.1. Methods, materials and techniques of rehabilitation, strengthening and retrofitting. Chapter 13. Rehabilitation and strengthening of underground structures. 13.1. Methods, materials and techniques of rehabilitation, strengthening and retrofitting. Chapter 14. New, green and innovative approaches to rehabilitation and strengthening. 14.1. Development of new materials for rehabilitation and strengthening. 14.2. Green construction materials and technologies, recyclable materials, eco-friendly materials, biodegradable products, low-emission insulation, and other sustainable building materials for rehabilitation and strengthening. 14.3. Trends and perspectives **IV.B. Training Activities** Description Туре Reading Reading of reports & Academic Articles Practical / Problem solving Real-case analysis (Case-Study) and problem solving Other Seminars from industry experts V. Student workload (hours) Lecture Classes 28 Practical classes/problem-solving, case studies, etc. 28 Practical sessions in technological laboratories, hospitals, etc. Tests 6 Academic Tutorials 22 Related Activities: conferences, seminars, etc. Preparation of lecture classes 40 Preparation of practical classes, problem-solving, case studies, 20 etc. **Test Preparation** 6 Total student workload 150 VI. Methodology and academic program Period Content Туре **Theoretical Classes** Week 1 to Week 14 Lectures, exposition and resolution of research works **Practical Classes** Week 1 to Week 14 Practice resolution, cases, research discussions/laboratory/simulations Week 15 to Week 20 Seminars and exam Exam VII. Assessment methods VII.A. Assessment weighting

Continuous ordinary assessment:

The distribution and characteristics of the assessment tests are described below. Only in the exceptional case and for special reasons may the teacher change the Guide. These changes will require the prior consultation with the Course Head and the prior and explicit authorisation of the Degree Program Coordinator, who will notify the Vice-rector's office in charge of Academic Affairs of the modifications made. In any case, the proposed changes must consider the verified report's stipulations. For these changes to take effect, they must be duly communicated at the start of the course to the students using Aula Virtual.

The combination of activities that are not re-assessable cannot exceed 50% of the course grade and, in general, cannot have a minimum grade (except for the case of laboratory or clinical work placements, where duly justified), and tests which exceed 60% of the course weighting cannot be added.

Extraordinary assessment: Students who do not manage to pass the ordinary assessment or who did not attend will be course to completion of an extraordinary assessment to verify their acquisition of the skills established in the guide, only for re-assessable activities. **Description of the tests for assessment and their weights**



A final exam will take place at the end of the seminar. The exam will be 40% of the final grade; the rest 60% comes from continuous		
evaluation. The exam will take place in a physical class. If the situation does not allow it, the exam will be online.		
VII.B. Assessment of students with an academic exemption		
A student who wishes to opt for this assessment will have to get an academic exemption for the course, which they will have to request		
from the Dean or Director of the Centre which teaches their course. An academic exemption may be granted where the courses own		
characteristics allow for it.		
Course with the possibility of an exemption: Yes		
VII.C. Review of assessment tests		
In accordance with the exam appeal regulations of the University	of Montenegro	
VII.DStudents with a disability or special educational needs		
Curricular adaptations for students with a disability or special ed	ucational needs will be determined by the Disabled Students Support	
Department in accordance with the regulations governing the	Disabled Students Support service, approved by the University of	
Montenegro to guarantee equal opportunities, inclusive treatmer	nt, universal accessibility and a more excellent guarantee of academic	
success.		
For this purpose, this Department will have to issue a curricula	ar adaptation report. Therefore, students with disabilities or special	
educational needs must contact the Department to analyse the all	ternatives.	
VII.EAcademic behaviour, academic integrity, and honesty		
The University of Montenegro is wholly committed to the highest	academic integrity and honesty standards. Therefore, studying at the	
University of Montenegro means you accept and agree to the aca	demic integrity and honesty values described in the University's Code	
of Ethics. To monitor this procedure, the University has Regulation	is on the academic behaviour at the University of Montenegro. It uses	
different tools (anti-plagiarism, supervision) to ensure these essen	itial values are entirely developed.	
VII. Bibliography		
Generic References		
1. Jure Radić i suradnici: Betonske konstrukcije – sanacije, Hrvatska sveučilišna naklada, Građevinski fakultet sveučilišta u Zagrebu,		
Zagreb, 2010.		
2. Jure Radić, Trajnost konstrukcija 1, Hrvatska sveučilišna naklada, Jadring, Građevinski fakultet sveućilišta u Zagrebu, 2010.		
3. Zemljoresno inženjerstvo: Dio 7. Ojačanja i Sanacija zgrada oš	stećenih zemljotresom; rekonstrukcije i adaptacije neoštećenih zgrada,	
Grupa autora Aničić, Fajtar, Petrović, Tomažević i dr., DIP "Građevinska knjiga", Beograd, 1990		
 Milenko Pržulj: Mostovi, Udruženje "Izgradnja", Beograd 2014. 		
Specific References		
1. Lawrence C. Bank: Composites for construction: Structural Design with FRP Materials, John Wiley & Sons, Inc., 2006.		
2. Scripts and slides from lectures.		
3. Eurocode 8-3 EN 1998-3: Design of structures for earthquake resistance - Part 3: Assessment and retrofitting of buildings.		
4. Eurocode 8-1 EN 1998-1: Design of structures for earthquake resistance - Part 1.		
 Task Group 9.3, Externally bonded FRP reinforcement for RC structures tib CEB-FIP Bulletin 14 Swizerland, 2001 Disputice Development for Materiale Andread Field Science Development Control of Co		
 Dionysios Bournas: Innovative Materials for Seismic and Energy Retrolitting of the Existing EU Buildings, JCR Technical Report, 2018 Dende DA, Devene DA, De Dette I, Contenting C, Teterbiller J, Contenting C, State C, St		
7. Pohoryles DA, Bournas DA, Da Porto F, Santarsiero G, Triantafillou T: Overview of combined seismic and energy upgrading		
technologies for existing buildings, 2022 Personal Sector Content of Content		
energy ungrading of existing buildings 2022	mod G, Givena D, Jelle BF. Technologies for the combilled seisific and	
Chicky upgraumg of existing buildings, 2022		
Lecturer/teacher/nrofessor's name	lelena Peiovic	
E-mail address	ielenanei2000@gmail.com	
	Civil Engineering - Structural Engineering	

 Area
 Civil Engineering – Structural Engineering

 Link
 https://www.ucg.ac.me/predmet/8/1/7/2020/11906

3.1.7 Urban Planning Basics

THE BASICS OF URBAN PLANNING			
Туре	Mandatory		
Teaching period	Master course, 3rd semester		
ECTS credits	5		
Language	MNE		
II. Presentation			
The primary task of teaching in this course is to introduce the	pasic elements of the built environment. The course is complex,		
considering key morphological characteristics collected from c	ity space and their correlation with the context in which they are located.		
III. Competences			
Generic competencies			
01. Know the basic parameters of morphogenetic analysis origins and characteristics of processes in the city's structure			
02. Observes the city from a historical perspective			
03. Highlights and analyses the origin and development of critical characteristics of a city or its part.			
Specific competences			
1 Convert the basic elements of urban space following the principles of sustainable development to adequate performance results			
2 Apply research methods and techniques for the development of projects of different types and purposes			
3 Identify the basic elements of urban space and their relationships in the present context taking into account sustainability issues			
and climate change			
IV. Contents			
VI.A. Syllabus			





Chapter 1. Basic elements of urban spaces				
1.1. House and plot-characteristics of constructio	n and function			
1.2. Street - construction characteristics and func	tions			
Chapter 2. City - physical and functional dimension	on			
2.1. City square - construction characteristics and	functions			
2.2. City block - construction characteristics and f	unctions			
2.3. Coasts and water surface				
Chapter 3. Location of city structures and distribute	ution of their elem	ients		
3.1. Size as a determinant of urban spaces				
3.2. The snape of urban spaces				
3.3. Transformation of urban space elements	o cmart urban play	nning		
S.4. The basic principles of sustainable and climat	e-sinart urban pla	lining		
[1] The development of the term sustainable de	evelopment and th	e central strategies for im	nlementation (e.g. Brundtland report	
Furopean Sustainable Development Strateg	v 2006 Sustainable	e development goals – for	us on SDG 11 $-$ sustainable cities and	
communities)	, 2000, 000000000			
[2] Sustainable urban development (Urban dim	ension of Cohesio	n Policy. The European Hul	b for sustainable urban development.	
Urban Agenda for the EU)		· · //		
Climate smart urban planning				
1. The differences between climate chan	ge adaptation and	mitigation – consequence	s for urban development	
2. Climate mitigation in urban planning -	energy planning, r	nobility planning		
3. Climate adaptation in planning – IPCC	risk concept – exp	osure, vulnerability and ris	k, Strategies and measures for climate	
change adaption, the concept of green	and blue infrastru	ucture		
Chapter 4. The urban planning process, procedur	es, and institutior	15		
4.1. System of urban planning and plans				
4.2. Structure and content of urban plans				
4.3. The urban planning process, procedures, and	institutions			
IV.B. Training activities				
Туре		Description		
Reading		Reading of reports		
		Reading of books and so	ientific papers	
		Reading of spatial and c	limate strategies (of EU)	
Practical / Problem solving		No practical activities		
Other		Seminars from industry	experts	
		Guest lectures		
		Site excursions		
V. Student workload (hours)				
Lecture classes		28		
Practical classes/problem-solving, case studies, et	.c.	28		
Practical sessions in technological laboratories, ho	ospitals, etc.	-		
Tests		6		
Academic tutorials		22		
Related activities: conferences, seminars, etc.		-		
Preparation of lecture classes		40		
Preparation of practical classes, problem-solving,	case studies,	20		
etc.				
Test Preparation		6		
Total student workload		150		
VI. Methodology and academic program				
lype	Period		Content	
Theoretical Classes	Week 1 to Week	15	Lectures	
Practical Classes	-		-	
Seminars & exam	Week 16 to Wee	k 20	Seminars and exam	
VII. Assessment methods				
VII.A. Assessment weighting				
Continuous ordinary assessment:				
The distribution and characteristics of the assess	nent tests are deso	cribed below. The teacher	may change the Guide only in exceptional	
cases and for particular reasons. These changes will require the prior consultation with the Course Head and the prior and explicit				
authorisation of the Degree Program Coordinator, who will notify the Vice-rector's office in charge of Academic Affairs of the				
modifications made. In any case, the proposed changes must consider the verified report's stipulations. For these changes to take				
effect, they must be duly communicated at the start of the course to the students using Aula Virtual.				
and a low control for the case of the sector	The combination of activities that are not re-assessable cannot exceed 50% of the course grade and, in general, cannot have a minimum			
grade (except for the case of laboratory or clinical work placements, where duly justified) and tests which exceed 60% of the course				
weignung cannot be added. Extraordinary assessment: Students who do not manage to pass the ordinary assessment or who did not attend will be subject to				
completion of a remarkable assessment to vorify	their acquisition of	f the skills established in th	ne guide only for re-assessable activities	
Description of the tests for assessment and their	weights	י נווב אוווא באנמטוואוופט ווו נו	The Barde, only for the assessable delivities.	
Description of the tests for assessment and their weights				



A final exam will take place at the end of the seminar. The exam will be 50% of the final grade, and the rest 50% comes from continuous			
evaluation. The exam will take place in a physical class. If the situa	ation does not allow it, the exam will be online.		
VII.B. Assessment of students with an academic exemption			
A student who wishes to opt for this assessment will have to get a	in academic exemption for the course, which they will have to request		
from the Dean or Director of the Centre which teaches their cours	e. An educational exemption may be granted where the course's		
characteristics allow it.			
Course with the possibility of an exemption: Yes			
VII.C. Review of assessment tests			
Following the exam appeal regulations of the University of Monte	negro.		
VII.DStudents with a disability or special educational needs			
The Disabled Students Support Department will determine curricu	lar adaptations for students with a disability or special educational		
needs following the regulations governing the Disabled Students	Support service, approved by the University of Montenegro to		
guarantee equal opportunities, inclusive treatment, universal acc	essibility, and a greater guarantee of academic success.		
For this purpose, this Department will have to issue a curricular a	daptation report. Therefore, students with disabilities or special		
educational needs must contact the Department to analyse the a	ternatives.		
VII.EAcademic behaviour, academic integrity, and honesty			
The University of Montenegro is completely committed to the hig	hest academic integrity and honesty standards. Therefore, studying at		
the University of Montenegro means you accept and agree to the	academic integrity and honesty values described in the University's		
Code of Ethics. To monitor this procedure, the University has Reg	ulations on the academic behaviour at the University of Montenegro. It		
uses different tools (anti-plagiarism, supervision), which provide a	collective assurance that these essential values are completely		
developed.			
VII. Bibliography			
Generic References			
M. Maletin: Planning and designing traffic roads in cities (Orion A	t, Beograd, 2009)		
B.Mirković: Osnove urbanizma 1A, 1B, 2A i 2B. (Građevinska knjiga, Beograd, 1967)			
Specific References			
V.Đokić: Urbana morfologija: Grad i gradski trg (Arhitektonski fak	ıltet, Beograd, 2004)		
D.Reba: Ulica elementi strukture i identiteta (Orion, Novi Sad, 201	0)		
Zhou, Jinomin: Urban Housing Forms (Amsterdam, 2005)			
Helmut Bott, Gregor Grassl, Stephan Anders (2019): Sustainable L	Irban Planning, Vibrant Neighbourhoods – Smart Cities – Resilience,		
edition digital			
Israa H. Mahmoud, Eugenio Morello, Fabiano Lemes de Oliveira, I	Davide Geneletti (2022): Nature-based Solutions for Sustainable Urban		
Planning, Greening Cities, Shaping Cities, Springer			
Barbara Norman (2022): Urban Planning for Climate Change, Rou	eledge Advances in Climate Change Research		
United Nations (2015): Transforming our World: The 2030 Agenda for Sustainable Development			
O.D., M.K. van Aalst, J. Birkmann, M. Fordham, G. McGregor, R. Perez, R.S. Pulwarty, E.L.F. Schipper, and B.T. Sinh (2012): Determinants			
of risk: exposure and vulnerability. In: Managing the Risks of Extre	of risk: exposure and vulnerability. In: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation [Field,		
C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, GK. Plattner, S.K. Allen, M. Tignor, and P.M.			
Midgley (eds.)]. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change (IPCC). Cambridge			
University Press, Cambridge, UK, and New York, NY, USA, pp. 65-108.			
IX.Lecturers/Teachers/Protessors			
Lecturer/teacher/professor's name	Svetislav Popović		
E-mail address	svetislav@ucg.ac.me		
Area	Urban design and planning		

3.2 University of Sarajevo

University of Sarajevo's Courses Modernization Proposal includes 3 courses, all of them at the master Level (Table 10).

Table 10 - Proposal of courses to modernize University of Sarajevo

No/Partner	Course na	ıme (ECTS)	Level of study	% of the modernized courses compared to content included in the course	Number of students to be accepted in the first year	Category	EU & associated partners involved in providing support to modernize WB HElls courses
	1.	Environmental Protection (6)	Master (120 ECTS)	< 10%	10	Spatial and urban planning	воки
8/UNSA	2.	Urban Roads (5)	Master (120 ECTS)	< 10%	20	Road design and mobility	UNI



		Master (120			Urban water	THOWL,
3.	Water Protection I (6)	ECTS)	< 10%	10	management	NMBU, BOKU

3.2.1 Environmental Protection

ENVI	RONMENTAL PROTECTION		
Туре Со		Compulsory	
Teac	ning period	Master course, II semester	
ECTS	credits	5	
Lang	uage	Bosnian	
II. Pro	esentation		
ne r	nain objective of this course is to acquire basic knowledge	about the environment, the causes of contamination and pollution, the	
const	ruction on the environment such as the impacts of cities l	andfills roads and other man-made structures and systems and provide	
the n	ecessary skills so that students are prepared to build in a	ccordance with the concept of sustainable development, and especially	
with	the principles of sustainable development in construction.		
III. Co	ompetences		
Gene	ric competences		
01.	Ability to understand and analyze the basic ecological cha	racteristics of water and the environment, sources and types of	
	environmental pollution, the impact of pollution on the st	tate of the environment, measures and activities in environmental	
02	protection,	the second se	
02.	Ability to understand and participate in planning and solv	ing problems in environmental protection with optimal use of available	
03	Ability to present one's own points of view and analyze ar	nd evaluate alternatives in using environment protection	
04.	Ability to present one sown points of view and analyze and Ability to verify and integrate up-to-date knowledge in the	e field of Environmental protection from the point of view of civil	
•	engineers.		
05.	Ability to apply knowledge to reducing the negative impact	ct of human activities on the environment creatively.	
06.	Be able to use and adapt databases in GIS; to create a bas	ic GIS project independently; to solve problems that may occur in the	
	use of a GIS project, independently create cartographic re	presentations in GIS; actively participate in the work of multidisciplinary	
07	teams in the development of plans and programs in the so	egment of environmental protection	
07.	Students apply their acquired knowledge and problem-so	iving skills in new or unramiliar environments within broader (or	
08	Actively participate in the work of multidisciplinary teams	in the development of plans and programs in the segment of	
00.	environmental protection	and the development of plans and programs in the segment of	
Spec	ific competences		
4	We are the set of the stiff of the second	and a start for the balance of the time of an athendal as the base of the start of the start of the start of the	
1.	know now to identify the needs and requirements of the	context in which the application of methodological tools is needed and	
	learn to propose appropriate solutions for research questions arising from the framework of the need for environmental protection		
2.	Develop reasoning and critical thinking for the analysis of	environmental reality through the identification, description, and	
	diagnosis of current environmental problems in which the	e student uses the tools provided by modern technologies.	
3.	Propose appropriate solutions based on the studied and a	acquired knowledge.	
IV. C	ontents		
VI.A.	Syllabus		
	1. Introduction to Environmental Protection. The basic	ecological concepts; Habitat; Ecology. Biotop ecosystem; Biodiversity.	
	2. Geochemical composition of the earth's crust: t	me hydrosphere and atmosphere. The causes of contamination by	
	3. The changes in the biosphere. Changes in the atmo	osphere. Pollution pedosphere. Pollution of the hydrosphere. Pollution	
	through energy discharge. Reduction of biodiversity.		
	4. The impact on the environment: The impact of cities	; The impact of building; The impact of the landfill; The impact of roads;	
	The impact of hydro-sturctures.		
	5. Introduction to geoinformatic. Spatial data infras	structure. Geographical Information Systems (GIS) in environmental	
	protection (Water information system; Information systems in the environment).		
	6. Sustainable Development and Construction: Principles and examples. Sustainable urban development. Environmental		
	Strategies.		
	anthropogenic factors. The measures and procedure	for reducing risk.	
	8. Measures and environmental protection procedures: The political and sociological approach: Legal measures: Planning and		
	environment management; Economic and financial measures; Scientific approach and technological measures; Institutional		
	measures.		
IV.B.	Training activities	Description	
Type	h	Description	
Read	ing	Reading of Books & Academic Articles	
Pract	ical / Problem solving	Linear-case analysis (Case-Study) and problem solving/ Practical Problem-Based learning: Manning air quality	
2 Laboratory/SuperMap / s		2. Laboratory/SuperMap / application of Super Map GIS software	
		in in the collection and the analysis of data related to	
		•	



		environmental ir	mpact assessment - various data on the state of
		the environment.	
Other		Seminars from industry experts/ -	
V. Student workload (hours)			
Lecture classes		30	
Practical classes/problem-solving, case studie	s, etc.	30	
Practical sessions in technological laboratorie	s, hospitals, etc.	-	
lests		2x15=30	
Related activities: conferences, seminars, etc.		10	
Prenaration of lecture classes		-	
Preparation of practical classes, problem-solv	ing. case studies.etc.	-	
Test preparation	8,	-	
Total student workload		125	
VI. Methodology and academic program			
Туре	Period		Content
Theoretical Classes	Week 1 to Week 15		Lectures, exposition and resolution of research works
Practical Classes	Week 1 to Week 15		Practice resolution, cases, research discussions/laboratory/simulations
Seminars & exam	Week 16 to Week 20)	Seminars and exam
VII. Assessment methods			
VII.A. Assessment weighting			
Continuous ordinary assessment:			
The distribution and characteristics of the ass	sessment tests are tho	se described below	v. Only in exceptional case and for special reasons
may the teacher add changes to the Guide.	hese changes will req	uire the prior con	sultation with the Course Head and the prior and
explicit authorization of the Degree Program	Coordinator, who will	I notify the vice-Re	ector's office in charge of Academic Affairs of the
effect, they must be duly communicated at th	e start of the course to	o the students usin	a Aula Virtual
The combination of activities that are not re-a	assessable cannot exce	ed 50% of the cou	rse grade and, in general, cannot have a minimum
grade (except for the case of laboratory or c	linical work placement	ts, where duly just	tified), and tests which exceed 60% of the course
weighting cannot be added.			
Extraordinary assessment: Students who do	not manage to pass	the ordinary asses	sment, or who did not attend, will be subject to
completion of an extraordinary assessment to	o verify their acquisitio	n of the skills esta	blished in the guide, only for activities that are re-
assessable.	h . t t. h		
Description of the tests for assessment and their weights			40% of final grade the rost 60% sames from the
A final exam that will be taking place at the end of the seminar. The exam will be a 40% of final grade, the rest 60% comes from the continuous evaluation. The exam will take place in physical class. Only if the cituation at the moment does not allow it, the exam will			at the moment does not allow it the exam will be
on line.			
VII.B. Assessment of students with an academic exemption			
Student who wants to opt for this assessmer	nt will have to get an a	academic exemption	on for the course, which they will have to request
from the Dean or Director of the Centre whi	ch teaches their cours	e. An academic ex	emption may be granted where the courses own
characteristics allow for it.			
Course with the possibility of an exemption: Y	′es		
VII.C. Review of assessment tests			
In accordance with the exam appeal regulation	ons of the University of	Sarajevo	
VII.DStudents with a disability or special ed	nucational needs	tional poods will b	a datarminad by the Disabled Students Support
Department, in accordance with the regulation	ins governing the Disat	oled Students Supr	port service, approved by the University of
Sarajevo to guarantee equal opportunities, in	clusive treatment, univ	versal accessibility	and a greater guarantee of academic success.
For this purpose, this Department will have to	o issue a curricular ada	, ptation report, the	refore students with disabilities or special
educational needs must contact the Departm	ent to analyze the diffe	erent alternatives t	together.
VII.EAcademic behavior, academic integrity	, and honesty		
The University of Sarajevo is completely comr	nitted to the highest si	tandards of acader	nic integrity and honesty. Therefore, studying at
the University of Sarajevo means you accept a	and agree to the acade	mic integrity and h	nonesty values described in the University's Code
or Etrics. To monitor this procedure, the University has Regulations on academic behavior at the University of Sarajevol and uses			vior at the University of Sarajevol and uses
VII. Bibliography			
Generic References			
Books			
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Hadžić, E., Bonacci, O. Environmentally acceptable watercourse management. University of Sarajevo-Faculty of Civil Engineering, 2019			nt. University of Sarajevo-Faculty of Civil
Brimicombe, Allan, GIS, environme	ental modeling and eng	gineering, 2nd ed. 2	2010, ISBN 978-1-4398-0870-2
Specific References			



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GEOBIZ, Branko Bozic, How to implement PBL into learning process, 2019-2022			
IX.Lecturers/Teachers/Professors			
Lecturer/teacher/professor's name	Prof.dr Emina Hadžić		
E-mail address	eminahd@gmail.com		
Area	Water Resources and Environmental Engineering		
Link	https://gf.unsa.ba/		

3.2.2 Urban Roads

URBAN ROADS				
Туре	Obligatory			
Teaching period	Master cycle course, 1st semester			
ECTS credits 6				
Language	Bosnian / English			
II. Presentation				
The main objective of this course is to an acquaintance of stud	lents with basic principles in the analysis and design of urban roads. To			
explain to students the basic physical terms related to traffic flo	ows and ways of analyzing the level of service of urban intersections and			
streets, design conditions, and elements of primary and seconda	ary network roads.			
III. Competences				
Generic competences				
01. Ability to present one's own points of view and analyse ar	nd evaluate alternatives in the area of analysis and design of urban			
roads.				
02. Ability to verify and integrate up-to-date knowledge in the	e field of analysis and design of urban roads.			
03. Ability to creatively apply knowledge in the area of analys	is and design of Urban Roads. Students apply their acquired knowledge			
and problem-solving skills in new or unfamiliar environme	ents within broader (or multidisciplinary) contexts related to the area of			
analysis and design of Urban Roads.				
Specific competences				
01. Understand the functioning of the traffic network and tra	ffic flows in urban conditions.			
02. Understands the basic terms related to the analysis of tra	ffic flows			
03. Understands the basic traffic flow equation				
04. Knows how to define basic terms related to the analysis o	if signalized intersections			
05. Can calculate the capacity and average delay of a signalize	ed intersection			
U6. Knows now to define the basic concepts related to the and	alysis of unsignalized intersections with special reference to roundabouts			
07. Knows now to calculate the capacity and average delay of	riounuabouls			
08. Independently create a level of service analysis and the cr	noice of design elements for urban roads.			
10 Know how to use software tools for analysing traffic flows	y measures and compare different project solutions based on them.			
10. Know now to use software tools for analysing traine nows	s. to the urban road network with special reference to their functional			
difference and differences in relation to the non-urban ne	stwork			
12 Know how to design different parts of urban road network	k according to the principle of functional hierarchy			
 Pronose appropriate urban road network solutions based on the overall urban development and respective the requirements of 				
all road users.				
IV. Contents				
VI.A. Syllabus				
Chapter 1. Basic parameters of traffic flows; the basic traffic flo	ow equation			
Practice 1/Laboratory/simulation. Field traffic counting				
Chapter 2. Basic parameters of traffic flows: signalized intersec	tions			
Practice 2/Laboratory/simulation. Analysis of one existing sig	gnalized intersection using HCM methodology and Highway Capacity			
Software (capacity calculation, delay calculation, critical lane d	letermination, queue length)			
Chapter 3. Basic parameters of traffic flows: signalized intersec	tions – HCM methodology			
Practice 3/Laboratory/simulation. Analysis of one existing sig	gnalized intersection using HCM methodology and Highway Capacity			
Software (capacity calculation, delay calculation, critical lane d	letermination, queue length)			
Chapter 4. Basic parameters of traffic flows: roundabouts				
Practice 4/Laboratory/simulation. Level of service analysis	of one-lane and two-lane roundabouts (capacity calculation, delay			
calculation, queue length, gap-acceptance parameters calculation)				
Chapter 5. Basic parameters of traffic flows: roundabouts - turbo roundabouts				
Practice 5/Laboratory/simulation. Level of service analysis of tu	rbo roundabouts (capacity calculation, delay calculation, queue length,			
gap-acceptance parameters calculation)				
Chapter 6. Analysis of traffic flows using the DataFromSky tool	and notwork alaments using DataFramSky application			
Chapter 7. Unsignalized intersections – HCM methodology: TW	Sau network elements using DataFromsky application			
Practice 7/Laboratory/simulation Analysis of unsignalized int	are and Aware Intersections tersections using HCM methodology and Highway Canacity Software			
Fractice //Laboratory/simulation. Analysis of unsignalized intersections using new internototogy and nignway capacity Software				
(capacity calculation, delay calculation, critical lane determination, queue length) Chanter & Analysis of city arterias				
Practice 8/Laboratory/simulation Analysis of urban streets (canacity calculation average travel time average sneed corridor				
calculation)				
Chapter 9, Basics of traffic microsimulations				



Practice 9/Laboratory/simulation. Introducing to PTV Vissim software; Commenting on different microsimulation models Chapter 10. Introduction to the elements of the urban road network: design elements of the primary and secondary road networks Practice 10/Laboratory/simulation. Commenting and analysis of different existing urban plans and traffic solutions in Sarajevo Chapter 11. Introduction to the elements of the urban road network: city and suburban arterial streets Practice 11/Laboratory/simulation. Commenting and analysis of different existing urban plans and traffic solutions in Sarajevo Chapter 12. Traffic related air pollution: pollutant types, measuring and data collection, analysis and simulation of traffic flow to determine the level of pollution, measures to reduce air pollution (design changes, public transportation, public policy etc.) Practice 12/Laboratory/simulation. Data collection on the field, pollution measurement and traffic flow simulation. Chapter 13. Design for the future Practice 13/Laboratory/simulation. Impact of increased use of electric and self-driving vehicles. Implementation of simulation models. IV.B. Training activities Description Туре Real-case analysis (Case-Study) and problem solving/existing intersections in Sarajevo (problems in terms of level of service and design elements) Real-case analysis (Case-Study) and problem solving/future road network plans in the Sarajevo region Practical / Problem solving Data collection on the field about traffic related pollution using new equipment, pollution measurement and traffic flow simulation. Analysis of collected data about air quality and comparison with the simulation models Semester practical assignment - analysis of different types of Other intersections V. Student workload (hours) 30 Lecture classes Practical classes/problem-solving, case studies, etc. 30 Tests 2x1,5 Academic tutorials 15 Total student workload 120 VI. Methodology and academic program Туре Period Content **Theoretical Classes** Week 1 to Week 15 Lectures, exposition and resolution of research works Practical Classes Week 1 to Week 15 Practice resolution, cases, research discussions/laboratory/simulations Seminars & exam Week 7; 15 and 20-30 Seminars and exam VII. Assessment methods VII.A. Assessment weighting Continuous ordinary assessment: During classes, the exam is written in two parts. Each part is scored as follows: 01. I partial test 60% 02. II partial test 30% 03. Semester assignment 10% In each part of the exam, the student must achieve a minimum of 55% points for the part of the exam to be considered passed. If the student does not achieve sufficient points on the partial exam, he can achieve those on the final/remedial exam. The final grade will be formed after successful completion and acceptance of the semester assignment according to the time frames that will be presented to the students when the assignment is given. If the student does not fulfill all obligations by the end of the semester, i.e. does not pass the exam, the assignment must still be accepted by the end of that semester for the student to acquire the condition for taking the exam in the September remedial deadlines. If the student fulfills all the above obligations, a final grade is formed according to the scale prescribed by the Law on Higher Education. Students who lack less than 5 points for grades 8, 9, and 10 can take the final exam orally for a higher grade. Cancellation of the exam: Students who have passed the partial exam and are not satisfied with the results achieved can cancel it within 5 working days after the announcement of the exam results and retake the same in the final/remedial exam. The same applies to the results of the final/remedial exam. VIII. Bibliography **Basic bibliography** D. Cvitanić, I. Lovrić, D. Breški: Traffic flow theroy, Faculty of Civil Engineering and Architecture, University of Split M.Maletin: Planning and design of roads in cities, Beograd 2005. Higway Capacity Manual 6TH Edition, Transportation Research Bord, Washington. D.C. 2016 Z. Kenjić: Manual for the design of roundabouts, Sarajevo 2009.

Madziel, M.; Jaworski, A.; Savostin-Kosiak, D.; Lejda, K. The Impact of Exhaust Emission from Combustion Engines on the Environment: Modelling of Vehicle Movement at Roundabouts. *Int. J. Automot. Mech. Eng.* **2020**, *17*, 8360–8371.



PTV Group. PTV Vissim: Improve Air Quality with Emissions Calculations from Bosch. Available online:			
https://company.ptvgroup.com/en/ptv-vissim-emissions-calculation-from-bosch (accessed on 2 December 2022).			
IX.Lecturers/Teachers/Professors			
Lecturer/teacher/professor´s name Ammar Šarić			
E-mail address ammar.saric@hotmail.com			
Area Road design and Traffic engineering			
Link https://gf.unsa.ba/			

3.2.3 Water Protection I

WATER PROTECTION I		
Туре	Compulsory	
Teaching period	Master course, III semester	
ECTS credits	5	
Language	Bosnian	
II. Presentation		
The main objective of this course is to acquire basic knowledge	e about the characteristics of natural waters, changes in water conditions,	
causes of changes, and water protection activities, measures a	and plans. Understanding the importance and application of an integral	
approach in the protection of water resources. Independent a	nalysis of the state of water resources, and application of mathematical	
modeling as a tool for forecasting and solving problems in wat	er protection.	
III. Competences		
Generic competences		
01. Ability to understand and analyze the basic physic -chen	nical and ecological characteristics of water, sources and types of water	
pollution, the impact of pollution on the state of the wa	ter, measures and activities in water protection,	
02. Ability to understand and participate in planning and sol	lving problems in water protection with optimal use of available resources	
and data, with appropriate software support.		
03. Ability to present one's own points of view and analyze	and evaluate alternatives in using water protection.	
04. Ability to verify and integrate up-to-date knowledge in t	the field of water protection from the point of view of civil engineers.	
US. Ability to apply knowledge to reducing the negative imp	act of numan activities on the water quality creatively.	
06. Ability to analyze and propose a comprehensive and sus	stainable solution to the problem of surface and underground water	
07 Ability to apply the knowledge gained in the course to se	olving practical tasks using modern software solutions	
08 Students apply the knowledge gamed in the course to so	solving skills in new or unfamiliar environments within broader (or	
multidisciplinary) contexts related to the area of water r	protection.	
Specific competences		
01. Know how to identify the needs and requirements of the	e context in which the application of methodological tools is needed and	
learn to propose appropriate solutions for research gues	tions arising from the framework of the need for water protection.	
02. Develop reasoning and critical thinking for the analysis of	of water quality through the identification, description, and diagnosis of	
current environmental problems in which the student us	es the tools provided by modern technologies.	
03. Propose appropriate solutions based on the studied and acquired knowledge.		
IV. Contents		
IV.A. Syllabus		
1. Basic characteristics of water resources. Water Framework Directive and others and on surface and ground water and current		
EU and BH legislation in the field of water protect	tion. Examples of good and insufficient approaches to water resources	
protection.	llution Quereus laitation of water recourses. Dilution and calf a wification	
2. Pressures on water resources. Sources of water po	nution. Overexploitation of water resources. Dilution and self-purification	
- processes and principles. Soli erosion and water e	amont Concept Dimensions and importance. Differences and advantages	
compared to unsustainable. Sustainable development	ant and water resources	
4 Water protection planning: measures and procedu	ures Basic principles of planning control of pollution sources basics of a	
systemic approach to water resources protection	and basic elements of creating a water protection plan	
5. Surface water pollution: Control mechanisms and n	neasures for reducing. Effluent quality. Receivers and protection of aquatic	
ecosystems. Environmentally acceptable flow. Proce	edures and measures for watercourse recovery in the basin, water corridor.	
and in the watercourse bed. Ecological engineering	and conventional engineering in the function of watercourse recovery.	
6. Groundwater pollution: Analysis and interpretati	ion. Groundwater remediation: methods, monitoring parameters and	
examples. Artificial groundwater recharge: method	Is and procedures.	
7. Early warning system and its importance on wate	er quality protection of surface water and on water quality and quantity	
protection of groundwater. Analysis and application. Systematic monitoring and IT. Examples of good practices.		
8. Mathematical models and their application on water protection. Examples.		
IV.B. Training activities		
Туре	Description	
Reading	Reading of Books & Academic Articles	
Practical / Problem solving	1. Workshop: Discussion on different strategies and projects of	
	groundwater remediation. Parameters for monitoring remediation.	
	2. SWOT analysis: System of monitoring and timely response to the	
	increase in pollution at the source of groundwater in Sarajevsko polje.	
	3. Laboratory: Data collection on the field and analysis of the results	
	or inspection of the water well	
Uther	Seminars from industry experts/ -	



V. Student workload (hours)				
Lecture classes		45		
Practical classes/problem-solving, case studies, etc.		30		
Practical sessions in technological laboratories, hospitals, etc.		-		
Tests		2x15=30		
Academic tutorials		15		
Related activities: conferences, seminars, etc		5		
Preparation of lecture classes		-		
Preparation of practical classes, problem-solv studies, etc.	ving, case	-		
Test preparation		-		
Total student workload		125		
VI. Methodology and academic program				
Туре	Period		Content	
Theoretical Classes	Week 1 to Week 1	15	Lectures, exposition and resolution of research works	
Practical Classes	Week 1 to Week 2	15	Practice resolution, cases, research discussions/laboratory/simulations	
Seminars & exam	Week 16 to Week	20	Seminars and exam	
VII. Assessment methods				
VII.A. Assessment weighting				
Continuous ordinary assessment:				
The distribution and characteristics of the as	sessment tests are t	hose described belo	w. Only in exceptional case and for special reasons	
may the teacher add changes to the Guide.	These changes will	require the prior cor	isultation with the Course Head and the prior and	
explicit authorization of the Degree Program	Coordinator, who	will notify the Vice-R	Rector's office in charge of Academic Affairs of the	
modifications made. In any case, the change	s proposed must co	, nsider the stipulatior	ns of the verified report. For these changes to take	
effect, they must be duly communicated at the	ne start of the cours	e to the students usi	ng Aula Virtual.	
The combination of activities that are not re-	assessable cannot e	xceed 50% of the cou	urse grade and, in general, cannot have a minimum	
grade (except for the case of laboratory or cli	nical work placeme	nts, where duly justif	ied), and tests which exceed 60% of the course	
weighting cannot be added.		,		
Extraordinary assessment: Students who do	not manage to pass	the ordinary assess	nent. or who did not attend. will be course to	
completion of an extraordinary assessment to	o verify their acquis	ition of the skills esta	blished in the guide, only for activities that are re-	
assessable.	,			
Description of the tests for assessment and	their weights			
A final exam that will be taking place at the end of the seminar. The exam will be a 40% of final grade, the rest 60% comes from the			% of final grade, the rest 60% comes from the	
continuous evaluation. The exam will take place in physical class. Only if the situation at the moment does not allow it, the exam will take place in physical class.			at the moment does not allow it, the exam will be	
VII.B. Assessment of students with an acade	mic exemption			
Student who wish to opt for this assessment will have to get an academic exemption for the course, which they will have to request				
from the Dean or Director of the Centre which teaches their course. An academic exemption may be granted where the courses own				
characteristics allow for it.				
Course with the possibility of an exemption:	Yes			
VII.C. Review of assessment tests				
In accordance with the exam appeal regulation	ons of the University	v of Sarajevo		
VII.DStudents with a disability or special ed	lucational needs			
Curricular adaptations for students with a dis Department, in accordance with the regulation	ability or special ed ons governing the D	ucational needs will b isabled Students Sup	be determined by the Disabled Students Support	
Sarajevo to guarantee equal opportunities, in	iclusive treatment, u	universal accessibility	and a greater guarantee of academic success.	
For this purpose, this Department will have to	o issue a curricular a	daptation report, the	erefore students with disabilities or special	
educational needs must contact the Departm	ent to analyze the o	lifferent alternatives	together.	
VII.EAcademic behavior, academic integrity	, and honesty		-	
The University of Sarajevo is completely com	mitted to the highe	st standards of acade	emic integrity and honesty. Therefore, studying at	
the University of Sarajevo means you accept	and agree to the aca	ademic integrity and	honesty values described in the University's Code	
of Ethics. To monitor this procedure, the Univ	versity has Regulation	ons on academic beh	avior at the University of Sarajevo and uses	
different tools (anti-plagiarism, supervision) v	which provides a col	lective assurance that	at these essential values are completely developed.	
VII. Bibliography				
Generic References				
Books:				
 Hadžić, E. Basics of groundwater p 2012 	 Hadžić, E. Basics of groundwater protection in granular media, University of Sarajevo - Faculty of Civil Engineering, Sarajevo, 			
 Hadžić, E., Bonacci, O. Environmer 	 2013 Hadžić, E., Bonacci, O. Environmentally acceptable watercourse management. University of Sarajevo-Faculty of Civil 			
 Engineering, 2019 Paul E. Hardisty, Ece Ozdemiroglu The economics of groundwater remediation and protection, Publisher: CRC Press, Year: 			tion and protection, Publisher: CRC Press, Year:	
2005, ISBN: 1566706432,9781566706438 Specific References				
Tedeschi, S. Protection of water systems and wastewater treatment. Civil Engineering Institute Zagreb. 1996			Engineering Institute Zagreb,1996	
IX.Lecturers/Teachers/Professors			-	



Lecturer/teacher/professor´s name	Prof.dr Emina Hadžić
E-mail address	eminahd@gmail.com
Area	Water Resources and Environmental Engineering
Link	https://gf.unsa.ba/

3.3 University of Mostar

University of Mostar's Courses Modernization Proposal includes 4 courses, all of them at the master Level (Table 11).

Table 11 - Proposal of courses to modernize University of Mostar

No/Partner	Cou	rse name (ECTS)	Level of study	% of the modernized courses compared to content included in the course	Number of students to be accepted in the first year	Category	EU & associated partners involved in providing support to modernize WB HEIIs courses
	01.	Durability, resilience and maintenance of structures (6)	Master (120 ECTS)	< 20%	10	Material science	UNI
	02.	Materials for energy efficient and sustainable buildings (5)	Master (120 ECTS)	< 20%	10	Material science	UNI
	03.	Special types of concrete (5)	Master (120 ECTS)	< 20%	10	Material science	UNI
9/UNMO	04.	Sustainable Buildings from natural materials (5)	Master (120 ECTS)	< 20%	10	Material science	UNI

3.3.1 Durability, resilience and maintenance of structures

DURABILITY, RESILIENCE AND MAINTENANCE OF STRUCTURES	6			
Туре	Mandatory			
Teaching Period	Master course, 3rd semester			
ECTS credits	5			
Language	BOS			
II. Presentation				
Introducing students to the basic terms related to the durabilit	y of structures during their usability. Durability, resilience, and			
maintenance of structures are very important and sometimes r	neglected during the design phase. With the knowledge obtained during			
this course, the students will be able to evaluate the main influ	ences in structures made from basic materials (concrete, wood,			
masonry, and steel). As the end result, the students will be able	e to assess maintenance costs and design durable, resilient, smart and			
sustainable structures.				
III. Competences				
Generic Competencies				
01. The student should master the basic knowledge in order	o ensure the sufficient durability of structures, their resistance and the			
reduction of their maintenance costs.				
02. Understanding of adverse impacts on structures				
03. Competence in conducting lifecycle analyses to evaluate the long-term performance and environmental impact of structures.				
04. Knowledge of emerging technologies, such as drones and sensors, for efficient and effective structural maintenance.				
Specific competences				
01. Competence in selecting construction materials with enh	anced durability characteristics for specific applications.			
2. Integrating sustainability principles into maintenance practices, considering both economic and environmental aspects.				
03. Understanding and implementing measures to adapt structures to the changing climate and environmental conditions.				
14. Proficiency in developing strategies to extend the operational life of existing structures through targeted maintenance and				
enhancements.				
05. Durability and resilience analysis with respect to the structural material used				
IV. Contents				
VI.A. Syllabus				
 Topic 1: General: Analysis of the main factors that in 	fluence the durability of structures (environmental conditions; conditions			
of use; quality of the project; quality of execution; properties of materials; properties of load-bearing systems; solution details;				
maintenance).				
 Topic 2: External influences on basic materials (ston 	e; wood; baked clay; mortar; concrete; classic reinforced and prestressed			
concrete; steel). Steel corrosion processes. Concrete corrosion processes. Wood decay processes.				
p				

- Topic 3: The influence of the durability of structures on their utility value, safety and maintenance costs. Modern requirements
 on the durability of structures. Constructions in an aggressive environment. Inspections, maintenance and observation
 (monitoring) of constructions. Durability experiences on constructed structures.
- Topic 4: Features of the durability of reinforced concrete and masonry constructions: Quality of materials. Installation of concrete. Protective layers of concrete. Continuation of concreting.
- Topic 5: Protection of classical and prestressed reinforcement. Protection of concrete. Concrete slabs in contact with soil and water. Impact of performance. Examples of good and bad details of building and bridge construction solutions. Practical experiences and regulations.
- Topic 6: Particularities of the durability of steel structures and steel-concrete type structures: Anti-corrosion protection of steel. Steel plates in contact with concrete. Examples of good and bad details of building and bridge construction solutions.
- Topic 7: Analysis of damage to steel structures from the aspect of material fatigue. Practical experiences and regulations.
- Topic 8: Particularities of the durability of wooden constructions and wood-concrete type constructions: Harmful effects of living organisms and moisture. Wood protection. Wood slabs in contact with concrete and stone.
- Topic 9: Examples of good and bad solution details. Practical experiences and regulations. Tour, inspection, analysis, testing, evaluation and possible solutions for some damaged buildings in an aggressive environment.
- Topic 10: Application of green materials and assessment of their properties with respect to durability, resilience and maintenance. Cooperation with material producers and Commission for preservation of national heritage. The aspect of energy efficiency during construction and maintenance.

IV.B. Training Activities					
Туре		Description			
Reading		Reading of reports & Academic Articles			
Practical / Problem solving		Real-case analysis (Case-Study)			
Other		-			
V. Student workload (hours)					
Lecture Classes		30	30		
Practical classes/problem-solving, case studie	s, etc.	30			
Practical sessions in technological laboratories	s, hospitals, etc.	-			
Tests		4			
Academic Tutorials		20			
Related Activities: conferences, seminars, etc.		-	-		
Preparation of lecture classes		20			
Preparation of practical classes, problem-solv	ing, case studies,	15			
etc.					
Test Preparation		6			
Total student workload		125			
VI. Methodology and academic program					
Туре	Period		Content		
Theoretical Classes	Week 1 to Week 15		Lectures, exposition and resolution of research		
			works		
Practical Classes	Week 1 to Week 15		Practice resolution, cases, research		
	discussions/laboratory/simulations				
Exam	Week 15 to Week 20 Seminars and exam				
VII. Assessment methods					
VII.A. Assessment weighting					
Continuous ordinary assessment:					
The grading system and assessment tests are described below. Once defined grading system cannot be changed during the semester as					
described in Rules of studying for I and II cycle at Dzemal Bijedic University of Mostar (UNMO).					
Ordinary assessment includes written and presented seminar paper which bares 30% of total grade for lecture classes. Rest 70% is					
acquired through two partial tests. The final grade will be formed after successful completion and acceptance of the semester assignment					
according to the time frames that will be presented to the students when the assignment is given. If the student fulfills all the above					
obligations, a final grade is formed according to the scale prescribed by the Law on Higher Education. According to Rules of studying for I					
and II cycle at UNMU, students' activities during the semester cannot exceed 50% of total grade.					
EXClaurian of the tests for assessment and their weights					
Description of the tests for assessment and their weights					
course has two partial tests that bares in total 70% of the final grade. Each test is weight 35%. The rest 30% comes from continuous					
evaluation through seminar paper. The main exam will take place only in student does not successfully complete both partial tests. The					
VII B. Assossment of students with an academic exemption					
VII.D. Assessment of students with an academic exemption					
VII C Paview of accessment tests					
VII.c. Review Of assessment tests					
In accordance with the exam appear regulations of the Dzemai bijeuic University of Mostar.					
VII.DStudents with a disability of special educational needs					
Curricula adjustment can be made for students with disability or special educational needs based on individual request. Request is sent					

to Faculty scientific and educational council which analyses and approves adjustments in order to provide equal opportunities, inclusive treatment, universal accessibility and a more excellent guarantee of academic success. Faculty is fully accessible for students/visitors with disability.

VII.E.-Academic behaviour, academic integrity, and honesty

martWB



The Dzemal Bijedic University of Mostar (UNMO) is committed to the highest academic integrity and honesty standards. Therefore, studying at UNMO means you accept and agree to the academic integrity and honesty values described in the University's Code of Ethics. To monitor this procedure, the University has Code of Teacher Ethics at UNMO. It uses different tools (anti-plagiarism, supervision) to ensure these essential values are entirely developed.

VII. Bibliography				
Generic References				
1. Radić J., Trajnost konstrukcija 1, Hrvatska sveučilišna na	aklada, Građevinski fakultet Sveučilišta u Zagrebu, 2010.			
2. Radić J. i suradnici: Betonske konstrukcije – sanacije, Hrv	vatska sveučilišna naklada, Građevinski fakultet Sveučilišta u Zagrebu, Zagreb,			
2010.				
3. Tomičić I.: Betonske konstrukcije, Školska knjiga Zagreb	o, 1988.			
Specific References				
1. Eurocode 2, 3, 4, 7, 8				
IX.Lecturers/Teachers/Professors				
Lecturer/teacher/professor's name	Merima Šahinagić-Isović			
E-mail address	merima.sahinagic@unmo.ba			
Area	Civil Engineering			
Link	https://gf.unmo.ba/media/1414/trajnost-otpornost-i-odrzavanje-			
	konstrukcija.pdf			

3.3.2 Materials for energy efficient and sustainable buildings

MATERIALS FOR ENERGY EFFICIENT AND SUSTAINABLE BUILDINGS				
Туре	Elective			
Teaching Period	Master course, 2nd semester			
ECTS credits	5			
Language	BOS			
II. Presentation				
Introducing students to basic terms related to materials used in knowledge that should help students in design, assessing and m gives useful information for the process of reconstruction of built	energy efficient buildings. The goal of the course is to provide aintenance of energy efficient and sustainable buildings. In addition, it ldings to increase their efficiency and sustainability. The main focus of			
the course is on materials that are used in these buildings. Histo	rical development, state-of-the-art and current trends in the field will			
be presented. The role of traditional materials, as well as the mo	odern and innovative ones, will be analyzed.			
III. Competences				
Generic Competencies	- 1 db			
01. Understanding the concepts of energy efficiency and susta	linability			
02. The student should master the basic knowledge of materia	als used for energy-efficient buildings.			
03. Innovative measures for reducing the amount of energy us	sea in buildings			
Specific competences	most and sustainable buildings			
01. Adaptation, Reconstruction or Creation of green, climate s	materials in situ and in laboratory			
U2. Ivieasuring thermotechnical performance of buildings and materials in situ and in laboratory U2. Compatibles of conducting life cycle assessments to determine the cycle installability of building materials				
US. Competence in conducting life cycle assessments to determine the sustainability of building materials.				
VI A Sullabur				
Topic 1: Introductory remarks, historical development of knowledge and examination of materials: Life cycle and sustainability				
parameters of materials.				
• Topic 2: The basic physical and mechanical properties of building materials, which are important for the thermotechnical				
performance of buildings, their functionality and durability.				
• Topic 3: Classification of materials in terms of their thermal insulation properties, vapor permeability, bulk density, porosity, water absorption, frost resistance, etc.				
 Topic 4: Traditional materials in modern construction and their contribution to the building's energy efficiency; types of traditional materials that can be used for building facades, exterior walls, floors, mezzanine ceilings, roof coverings, etc. Topic 5: Modern building materials and analysis of their properties, with an emphasis on their possibilities for improving the energy performance of buildings, as well as their environmental suitability. Concrete and cement: challenges and possible contributions to sustainability; Materials for energy-efficient thermal insulation 				
Topic 5: Methods and laboratory and field equipment for thermotechnical diagnostics performance of buildings. Laboratory and field use of equipment.				
• Topic 6: Sustainable construction and selection of materials, sustainable materials; criteria for environmental assessment of materials; harmful effects of some building materials on living organisms				
• Topic 7: Understanding of pollution and low carbon solutions. Introduction to 3Ps (people, planet, profit), 5 Rs (refuse,				
reduce, reuse, repurpose, and then recycle), relations between civil engineering and climate change to promote urban				
resilience, and 17 Sustainable Development Goals.				
IV.B. Training Activities				
Туре	Description			
Reading	Reading of reports & Academic Articles			
Practical / Problem solving	Real-case analysis (Case-Study) and problem solving			
Other -				



lecture classes 30 Practical classes/problem-solving, case studies, etc. 30 Practical sessions in technological laboratories, hospitals, etc. - Tests 4 Academic Tutorials 20 Related Activities: conferences, seminars, etc. - Preparation of practical classes, problem-solving, case studies, etc. - etc. - Test Preparation of practical classes, problem-solving, case studies, etc. - Total student workload 125 VI. Methodology and academic program Content Theoretical Classes Week 1 to Week 15 Practical Classes Week 1 to Week 15 Practical Classes Week 1 to Week 20 Seminars and exam VII.A sessement methods VII.A. Assessment methods VII.A. Assessment in cludes written and presented seminar paper which bares 30% of total grade for lecture classes. Rest 70% is acquiring the semsetrer as described below. Once defined grading system cannot be changed during the semsetrer as described in Rules of studying for 1 and II cycle at Dzenal Bijedic University of Mostar (UNMO). Ordinary assessment: Includes written and presented seminar paper which bares 30% of total grade for lecture classes. Rest 70% is acquiring in system cannot be changed during the semester as described by th	V. Student workload (hours)				
Practical classes/problem-solving, case studies, etc. 30 Practical sessions in technological laboratories, hospitals, etc. - Tests 4 Academic Tutorials 20 Related Activities: conferences, seminars, etc. - Preparation of lecture classes 20 Preparation of practical classes, problem-solving, case studies, 15 etc. - Total student workload 125 VI. Methodology and academic program 6 Type Period Content Theoretical Classes Week 1 to Week 15 Lectures, exposition and resolution of research works Practical Classes Week 1 to Week 15 Lectures, exposition and resolution of research discussions/laboratory/simulations Exam Week 15 to Week 20 Seminars and exam VII. Assessment methods Continuous ordinary assessment: The grading system and assessment and presented seminar paper which bares 30% of total grade for lecture classes. Rest 70% is acquired in find alexam. The final grade will be formed after successful completion and acceptance of the semisomy well according to the scale prescribed by the Law on Higher Education. According to Rules of studying to the scale prescribed by the Law on Higher Education. According to Rules of studying to the scale prescribed by the Law on Higher Education. According to Rules of stu	Lecture Classes		30		
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	VII. Bibliography				
Generic Keterences					
1. Muravljev M.: Građevinski materijali, Građevinska knjiga, Beograd, 2010.					
2. Domone P. and Illston J.: Construction materials: their nature and behaviour, Fourth edition, Spon Press, 2010.					
Specific References					
IX.Lecturers/Teachers/Professors	IX.Lecturers/Teachers/Professors				
Lecturer/teacher/professor´s name Merima Šahinagić-Isović	Lecturer/teacher/professor's name		Merima Šahinagić-Isović		
E-mail address merima.sahinagic@unmo.ba	E-mail address		merima.sahinagic@	<u>Punmo.ba</u>	
Area Civil Engineering	Area	1	Civil Engineering		
Link https://gf.unmo.ba/media/1397/materijali-za-energetski-efikasne-i- odr%C5%BEive-zgrade.pdf	Link		https://gf.unmo.ba odr%C5%BEive-zgr	a/media/1397/materijali-za-energetski-efikasne-i- rade.pdf	
3.3.3 Special types of concrete					

SPECIAL TYPES OF CONCRETE				
Туре	Elective			
Teaching Period	Master course, 3rd semester			
ECTS credits	5			
Language	BOS			
II. Presentation				



Introducing students to basic terms related to special types of concrete in the theory and technology of concrete. There are many different types of concrete. They are used for different purposes. During this course the students will gain knowledge that should help them to select the most appropriate type of concrete. To get to this level of expertise, students will learn about properties of special types of concretes and their production process. Special attention will be given to the sustainability of each of the analyzed concretes. III. Competences

Generic Competencies

- 01. The student should master basic knowledge about special types of concrete, their preparation and application.
- 02. Understanding the environmental impact of specialized concrete formulations and exploring eco-friendly alternatives. Integrating specialized concrete considerations into project management, including timelines and cost estimates

03.

- Specific competences
- 01. Ability to analyze and select specialized concrete materials based on project requirements.
- 02. Proficiency in conducting tests and ensuring quality control for specialized concrete formulations.
- 03 Mastery of design principles for special types of concrete, considering performance and durability.

IV. Contents

VI.A. Syllabus

- Topic 1: Designing the composition of concrete with specified properties in use
- Topic 2: Light and heavy concretes
- Topic 3: Recycled concrete
- Topic 4: Pumped concrete and shotcrete
- Topic 5: Massive, rolled and vacuum-packed concrete
- Topic 6: Underwater concrete
- Topic 7: Fibre reinforced concretes
- Topic 8: Concretes of very low, large, ultra-high strength and high-performance properties
- Topic 9: Self-compacting concrete
- Topic 10: Concrete for pavement structures
- Topic 11: Concrete for prefabricated elements
- Topic 12: Concrete with waste materials
- Topic 13: Sustainability of special concrete

	.oneretes				
IV.B. Training Activities					
Туре		Description			
Reading		Reading of repo	orts & Academic Articles		
Practical / Problem solving		Real-case analy	sis (Case-Study) and problem solving		
Other		-			
V. Student workload (hours)					
Lecture Classes		30			
Practical classes/problem-solving, case studie	s, etc.	30			
Practical sessions in technological laboratorie	s, hospitals, etc.	-			
Tests		4			
Academic Tutorials		20			
Related Activities: conferences, seminars, etc.		-	-		
Preparation of lecture classes		20			
Preparation of practical classes, problem-solving, case studies,		15			
etc.					
Test Preparation		6			
Total student workload		125			
VI. Methodology and academic program					
Туре	Period		Content		
Theoretical Classes	Week 1 to Week 15		Lectures, exposition and resolution of research		
			works		
Practical Classes	Week 1 to Week 15		Practice resolution, cases, research		
			discussions/laboratory/simulations		
Exam	Week 15 to Week 20		Seminars and exam		
VII. Assessment methods					

VII.A. Assessment weighting

Continuous ordinary assessment:

The grading system and assessment tests are described below. Once defined grading system cannot be changed during the semester as described in Rules of studying for I and II cycle at Dzemal Bijedic University of Mostar (UNMO).

Ordinary assessment includes written and presented seminar paper which bares 30% of total grade for lecture classes. Rest 70% is acquired through two partial tests. The final grade will be formed after successful completion and acceptance of the semester assignment according to the time frames that will be presented to the students when the assignment is given. If the student fulfills all the above obligations, a final grade is formed according to the scale prescribed by the Law on Higher Education. According to Rules of studying for I and II cycle at UNMO, students' activities during the semester cannot exceed 50% of total grade.

Extraordinary assessment: N/A

Description of the tests for assessment and their weights

Course has two partial tests that bares in total 70% of the final grade. Each test is weight 35%. The rest 30% comes from continuous evaluation through seminar paper. The final exam will take place only if student does not successfully complete both partial tests. The final exam is a physical and will take place at the end of the seminar.



VII.B. Assessment of students with an academic exemption			
Course with the possibility of an exemption: No			
VII.C. Review of assessment tests			
In accordance with the exam appeal regulations of the Dzemal Bij	edic University of Mostar.		
VII.D. Students with a disability or special educational needs			
Curricula adjustment can be made for students with disability or	special educational needs based on individual request. Request is sent		
to Faculty scientific and educational council which analyses and a	pproves adjustments in order to provide equal opportunities, inclusive		
treatment, universal accessibility and a more excellent guarantee of	of academic success. Faculty is fully accessible for students/visitors with		
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1. Bjegović D., Stirmer N.: Teorija i tehnologija betona, Zagreb, 2015.			
2. Šahinagić-Isović M.: Posebne vrste betona – Mikroarmirani beton, Mostar, 2015.			
3. Muravljov M.: Osnovi teorije i tehnologije betona, Beograd, 2008.			
4. Grdić D.: Effect of addition of finely milled recycled glass obtained from cathode tubes on the properties of cement mortar and			
concrete, Niš, 2020.			
Specific References			
IX.Lecturers/Teachers/Professors			
Lecturer/teacher/professor's name Merima Šahinagić-Isović			
E-mail address merima.sahinagic@unmo.ba			
Area	Civil Engineering		
Link	https://gf.unmo.ba/media/1406/posebne-vrste-betona.pdf		
3.3.4 Sustainable Buildings from natural materials			

Type Elective Teaching Period Master course, 2nd semester ECTS credits 5				
Teaching Period Master course, 2nd semester ECTS credits 5				
ECTS credits 5				
Language BOS				
II. Presentation				
Improve students' knowledge about innovative, renewable, natural materials, their properties, and the relationship with other				
materials in construction. To build students' capacities and their knowledge about natural and artificial materials, the importance of	of			
renewables through practical examples, contemporary applications and possibilities. To train the student to make an optimal design	gn			
assessment that will meet all the requirements of modern sustainable architecture and energy efficiency. Present the socio-econom	mic			
values and responsibility of the circular economy.				
III. Competences				
Generic Competencies				
01. Proficiency in natural materials' properties and performances				
02. Ability to assess, select and conceptualize an integrated solution innovative building materials.				
03. Critical analysis of existing practices of classical construction and materials, cost, durability and life cycle of materials;				
04. Critical analysis and feasibility studies involving interdisciplinary solutions with natural renewable materials.				
05. Understanding traditional and modern methods of using renewable natural materials with all their advantages and disadvantages				
with a precise overview of where and when they may be used.				
Specific competences				
01. Understanding and applying passive design strategies that leverage building materials for energy efficiency.				
U2. Ability to conduct a case study analysis of buildings from natural materials.				
0. Expension in switching to halural materials in parts of for the whole buildings during design of reconstruction. 04. Cost and environmental analysis of using natural materials in buildings				
04. Cost and environmental analysis of using natural materials in buildings.				
V. A Sullaburg				
VI.A. Synauus				
Topic 1: Natural materials throughout instory Topic 2: Characteristics and expensional expensional expensional expensional				
Topic 2. Characteristics and properties of natural relevable indefinits Topic 2. Transferred filling constructions with natural materials				
 Topic 5. Typologies of building constructions with natural materials Topic 4: Innovative products and objects made of natural materials 				
Topic 4: Innovative products and objects made of natural materials Topic 5: Development of an innovative approach to constructions from natural materials				
Topic 5: Development of an innovative approach to constructions from natural materials Topic 6: Modern technologies and methods				
I opic b: iviodern technologies and methods Table 7. Innovative elements of contemporary renewable constructions				
Topic 7: Innovative elements of contemporary renewable constructions				
Topic 8: Examples of public buildings built from natural materials in the world				
Topic 9: Duration and other socio-economic values				
IOPIC 10: Fire protection Table 24 Not and each solution				
Topic 11: Natural materials and health				
Iopic 12: waste, recycling and reuse				



- Topic 13: Life Cycle Analysis, Design for deconstruction
- Topic 14: Collaboration with experts from other fields to create sustainable buildings
- Topic 15: Examples from practice: Sustainable construction and selection of materials, sustainable materials; criteria for environmental assessment of materials: harmful effects of some building materials on living organisms

IV B Training Activities					
		Description			
lype Roading		Peading of reports & Academic Articles			
Reading		Real-case analys	Reading of reports & Academic Articles		
Other		-			
V Student workload (bours)					
		20			
Practical classes / problem-solving, case studie	is etc	30			
Practical classes, problem-solving, case studie	s hospitals etc	-			
	5, 1105pitai5, etc.	- 			
Academic Tutorials		20			
Related Activities: conferences seminars etc		-			
Preparation of lecture classes	•	20	20		
Preparation of practical classes problem-solv	ving case studies	15	15		
etc.					
Test Preparation		6			
Total student workload		125			
VI. Methodology and academic program					
	Period		Content		
Theoretical Classes	Week 1 to Week 1	5	Lectures, exposition and resolution of research		
		-	works		
Practical Classes	Week 1 to Week 1	5	Practice resolution, cases, research		
			discussions/laboratory/simulations		
Exam	Week 15 to Week	20	Seminars and exam		
VII. Assessment methods					
VII.A. Assessment weighting					
Continuous ordinary assessment:					
described in Rules of studying for I and II cycle at Dzemal Bijedic University of Mostar (UNMO). Ordinary assessment includes written and presented seminar paper which bares 30% of total grade for lecture classes. Rest 70% is acquired in final exam. The final grade will be formed after successful completion and acceptance of the semester assignment according to the time frames that will be presented to the students when the assignment is given. If the student fulfills all the above obligations, a final grade is formed according to the scale prescribed by the Law on Higher Education. According to Rules of studying for I and II cycle at UNMO, students' activities during the semester cannot exceed 50% of total grade. Extraordinary assessment: N/A Description of the tests for assessment and their weights A final exam will take place at the end of the seminar. The exam will be 70% of the final grade; the rest 30% comes from continuous					
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Inomas R., Fordnam M.: Environmental Design, Taylor & Francis, 2009. Demons D. and Illeton L. Construction metanicle their network of the first state of the difference of the differen					
3. Domone P. and Illston J.: Construction materials: their nature and behaviour, Fourth edition, Spon Press, 2010.					
Specific References					
1. Berge B.: The Ecology of Building Materials, Reed Educational and Professional Publishing Ltd, 2000.					
IA.Lecturers/ I eachers/ Professors					
Lecturer/teacher/professor's name		Marko Ćećez			
E-mail address		marko.cecez@unn	narko.cecez@unmo.ba		
Area Civil Engineering					


Link	https://gf.unmo.ba/media/1399/odrzivi-objekti-od-prirodnih-
	materijala.pdf

3.4 University of Bihac

University of Bihac's Courses Modernization Proposal includes 3 courses (Table 12).

Table 12 - Proposal of courses to modernize University of Bihac

No/Partner	Cou	rse name (ECTS)	Level of study	% of the modernized courses compared to content included in the course	Number of students to be accepted in the first year	Category	EU & associated partners involved in providing support to modernize WB HEIIs courses
	01.	Building materials (5)	Bachelor (240 ECTS)	< 20%	20	Material science	UNI
	02.	Energy efficiency (5)	Master (120 ECTS)	< 20%	10	Energy efficiency	URJC
10/UNBI	03.	Spatial planning (5)	Bachelor (240 ECTS)	< 20%	20	Spatial and urban planning	BOKU

3.4.1 Building Materials

BUILDING MATERIALS				
Туре	Compulsory			
Teaching period	Bachelor, 2 nd semester			
ECTS credits	5			
Language	Bosnian			
II. Presentation				
The course Building Materials provides basic knowledge about materials used in construction. These include both traditional contemporary construction materials. First, the students will learn about the properties of materials and their physical, chemical, mechanical characteristics. Destructive and non-destructive material testing will be analyzed. Practical work is an important part of learning process in this course. The equipment for material testing will be used. Thermal properties and thermal testing are signific components for creating energy efficient buildings, and as such, they will be theoretically and practically be introduced in this course Building materials analyzed in this course are: stone, aggregate, ceramics, mineral binders, cement, water, plasters, concrete, metals wood. In addition, insulation, composite, innovative, eco-friendly and smart materials are presented. The students will learn about technology of production and protection, as well as the ways of degradation of building materials. The students will have the opportut to benefit from organized visits to material manufacturers, testing laboratories and construction sites.				
III. Competences				
Generic competences				
 01. Explain the production technology of various building 02. Examine the properties of different building material 03. Explain the mechanisms of degradation of building m 04. Explain ways to protect building materials with respective 	inaterials Is naterials ect to degradation mechanisms			
Specific competences				
 Apply the results of testing building materials Acquire basic skills of handling laboratory equipmen Specific competencies, such as selecting the approp material testing, would be developed within the france 	It for testing building materials priate building materials for building structures and appropriate ways of mework of individual tasks in laboratory exercises.			
IV. Contents				
VI.A. Syllabus				
Chapter 1. INTRODUCTION 1.1. Properties and characteristics of building materials 1.2. State parameters and structural characteristics 1.3. Physical characteristics 1.4. Physical and mechanical properties Practice 1. Exercise 1. Composition of structures and textures of materials (atoms, molecules, ions)				
Chapter 2. THE BASIC PROPERTIES OF CONSTRUCTION MATERIALS, STATE PARAMETERS 2.1. Physical properties 2.2. Hydro-physical properties 2.3. Thermo-technical properties 2.4. Other important physical properties Practice 2. State parameters				



Chapter 3. TESTING OF MATERIALS WITH AND WITHOUT DESTRUCTION 3.1. Ultrasound method 3.2. Gamma radiation method 3.3 Method of neutron radiation 3.4. Method of measuring surface hardness 3.5. Magnetic method 3.6. Vibration method Practice 3. Practical tests of materials using methods with and without destruction Chapter 4. BUILDING STONE 4.1. Types of rocks 4.2. Properties of stone and testing procedures 4.3. Application of stone 4.4. Stone processing Practice 4. Examination of the stone and its characteristics Chapter 5. AGGREGATE 5.1. Natural aggregate 5.2. Artificial aggregate 5.3. Granulometric composition of aggregates 5.4. Shape, appearance and surface of aggregate grains 5.5. Physical and mechanical properties of aggregates Practice 5. Aggregate sieving and fraction size determination Chapter 6. CERAMIC MATERIALS 6.1. Types of clay 6.2. Properties of clay 6.3. Production of ceramic materials for construction 6.4. Testing of building ceramics products 6.5. Construction ceramic products Practice 6. Laboratory testing of ceramic materials Chapter 7. MINERAL BINDERS 7.1. General about construction plaster 7.2. Physical and mechanical properties of gypsum 7.3. General about construction lime 7.4. Physical and mechanical properties of lime 7.5. Magnesite binder 7.6. Water glass Practice 7. Laboratory tests of mineral binders Chapter 8. CEMENT 8.1. Cement production technology 8.2. Division of cement 8.3. Properties and testing procedures of cement Practice 8. Cement testing for grinding fineness, constant volume, etc. Chapter 9. APPLICATION OF WATER IN CONSTRUCTION 9.1. Origin of water 9.2. Impurities in water 9.3. Water hardness 9.4. Aggressive effect of water 9.5. Water for making mortar and concrete Practice 9. Test of hardness and aggressiveness in constructions Chapter 10. PLASTERS 10.1. Types of mortar 10.2. Application of mortar 10.3. Materials for making plaster 10.4. Properties of mortar mixtures and hardened mortar 10.5. Determination of mortar composition 10.6. Division of mortar according to the type of binder 10.7. Division of mortar according to purpose Practice 10. Testing of the workability and workability of the mortar mixture Chapter 11. CONCRETE 11.1. Types of concrete 11.2. Concrete components 11.3. Properties of fresh concrete 11.4. Physical and mechanical properties of hardened concrete Practice 11 Concrete compression and tension testing Chapter 12. METALS 12.1. Metal extraction technology 12.2. Division and types of metals 12.3. Obtaining steel Practice 12. Tensile and tensile tests of steel, reinforcing steel Chapter 13. USE OF WOOD IN CONSTRUCTION



13.1. Advantages	and disadvantages						
13.2. Types of wo	od						
13.3. Chemical co	13.3. Chemical composition						
13.4. Degree of p	13.4. Degree of processing						
Practice 13. Testi	ng wood for splitting, tensior	and hardness					
Chapter 14. USE (OF RECYCLED MATERIALS IN	CONSTRUCTION					
14.1. Advantages	14.1. Advantages and disadvantages						
14.2. Types of rec	cycled material						
14.3. Use of the s	cale concept						
14.4. Economical	use of recycled material, effi	ciency in environment	al pro	tection			
Practice 14. Testi	ng of recycled asphalt and its	reuse in road construe	tion				
Chapter 15. OTHE	R MATERIALS						
15.1. Insulation m	naterials						
15.2. Composites							
15.3. Innovative r	materials						
15.4. Green and e	eco-friendly materials						
15.5 Smart mater	ials						
Practice 15. Susta	inable construction						
IV.B. Training act	ivities						
Туре			Desc	ription			
Reading			Read	ling of reports	s & A	cademic Articles	
Practical / Proble	m solving		Real	-case analysis	(Cas	e-Study) and problem solvi	ng/Exercise with
*	5		the	equipment for	r test	ing of concrete and therma	al testing
						Ŭ	Ğ
Other			Sem	inars from ind	lustr	y experts. The course includ	des visits to
			mat	erial manufact	turer	s, construction companies	and material
			testi	ng laboratorie	es thr	rough seminars.	
V. Student work	oad (hours)			<u> </u>		0	
Lecture classes				30			
Practical classes/	problem-solving, case studies	s. etc.		30			
Practical sessions	in technological laboratories	s, hospitals, etc.		15			
Tests		, поэрнаю, есс.		15			
Academic tutoria	ls			x			
Related activities	conferences seminars etc			15			
Prenaration of leg	ture classes			Y Y			
Preparation of pr	actical classes problem-solvi	na case studies etc		x			
Tost proparation	actical classes, problem-solv	lig, case studies,etc.		25			
Test preparation	kload			125			
VI Methodology	and academic program			125			
Turno	and academic program	Doriod			Cont	tont	
Theoretical Class		Wook 1 to Wook 1E			Lectures exposition and resolution of research		
	25	Week I to week 15			works		
Dractical Classes		Maak 1 to Maak 15			WORKS		
Practical Classes		Week I to week IS			discussions (laboratory /simulations		
C		Maal: 17 to Maal: 20			discussions/laboratory/simulations		
Seminars & exam		week 17 to week 20		Seminars and exam			
VII. Assessment r	nethods						
VII.A. Assessmen	t weighting						
Continuous ordin	lary assessment:				~ '		
The distribution a	ind characteristics of the ass	essment tests are those	e desc	ribed below. (Only	in exceptional case and for	special reasons
may the teacher a	add changes to the Guide. Th	iese changes will requi	re the	prior consulta	ation	with the Course Head and	the prior and
explicit authoriza	tion of the Degree Program (oordinator, who will r	otify	the Vice-Recto	or's o	office in charge of Academic	c Affairs of the
modifications ma	de. In any case, the changes	proposed must consid	er the	stipulations o	of the	e verified report. For these	changes to take
effect, they must	be duly communicated at th	e start of the course to	the s	tudents using	Aula	Virtual.	
The combination of activities that are not re-assessable cannot exceed 50% of the course grade and, in general, cannot have a minimum							
grade (except for the case of laboratory or clinical work placements, where duly justified), and tests which exceed 60% of the course							
weignung cannot be added.							
Extraordinary assessment: Students who do not manage to pass the ordinary assessment, or who did not attend, will be subject to							
completion of an extraordinary assessment to verify their acquisition of the skills established in the guide, only for activities that are re-							
assessable.							
Description of th	Description of the tests for assessment and their weights						
A final exam that will be taking place at the end of the seminar. The exam will be a 50% of final grade, the rest 60% comes from the							
continuous evaluation. The exam will take place in physical class. Unly if the situation at the moment does not allow if, the exam will be							
on me.							
l I	Varification mathed						
	vermeauon methou			%		Term	
	Attendance			10		-	
	Activity in class			10		-	



	Written exam	40	-				
	Oral exam	40					
VII.B. Assessmen	It of students with an academic exemption						
Student who wis	h to opt for this assessment will have to get an a	ademic exemption for the	course, which they will have	ve to request			
from the Dean or	Director of the Centre which teaches their cour	e. An academic exemptior	may be granted where the	e courses own			
characteristics al	low for it.		,				
Course with the	possibility of an exemption: Yes						
VII.C. Review of	assessment tests						
In accordance wi	th the exam appeal regulations of the University	of Bihac					
VII.DStudents v	with a disability or special educational needs						
Curricular adapta	ations for students with a disability or special edu	cational needs will be dete	ermined by the Disabled Stu	Jdents Support			
Department, in a	ccordance with the regulations governing the Dis	abled Students Support se	rvice, approved by the Uni	versity of Bihac o			
guarantee equal	opportunities, inclusive treatment, universal acc	essibility and a greater gua	rantee of academic success	s.			
For this purpose,	this Department will have to issue a curricular a	daptation report, therefore	e students with disabilities of	or special			
educational need	is must contact the Department to analyze the d	fferent alternatives togeth	er.				
VII.EAcademic	behavior, academic integrity, and honesty						
The University of	Bihać is completely committed to the highest st	andards of academic integr	ity and honesty. Therefore	, studying at the			
University of Biha	ac means you accept and agree to the academic	ntegrity and honesty value	s described in the Universi	ty's Code of			
Ethics. To monito	or this procedure, the University has Regulations	on academic behavior at th	ne University of Bihac and ι	uses different			
tools (anti-plagia	rism, supervision) which provides a collective ass	urance that these essentia	I values are completely dev	/eloped			
VII. Bibliography	,						
Generic Referen	ces						
1.Mihajlo Muravi	ljov: Građevinski materijali, GK Beograd, 2000.						
Specific Reference	ces						
1.Ukrainczyk, V.:	Poznavanje gradiva, Institut građevinarstva Hrva	tske, Alcor, Zagreb, Udžbe	nik Sveučilišta u Zagrebu, 2	001.			
2.Ukrainczyk, V.:	Beton: struktura, svojstva, tehnologija, Građevin	ski fakultet Sveučilišta u Za	grebu, 1994.				
3. Bjegović D. i di	r.: Auditome vježe, Praktikum, Građvinski fakulte	t Sveučlista u Zagrebu, 199	4.				
4.Beslać J.: Mate	rijali u arhitekturi i građevinarstvu, Školska knjiga	, Zagreb, 1989.					
IX.Lecturers/Tea	chers/Professors						
Lecturer/teacher	r/professor´s name	EDIS SOFTIĆ					
E-mail address		edissoftic80@gmail.com					
Area		Civil Engineering					
Link							
3.4.2 Energy Efficiency							
ENERGY EFFICIEN	NCY						
Туре	Type Compulsory						
Teaching period	Teaching period Master, 1 st semester						
ECTS credits	ECTS credits 5						
Language Bosnian							
II. Presentation							
The goal of the course is to introduce students to the issue of energy efficiency of buildings, to provide a link between building physics, building design elements, climate and other local conditions, to familiarize them with alternative energy sources in modern buildings, and the principles of energy certification and energy inspection of buildings. Elements of building design from the aspect of increasing energy efficiency; Energy balance of buildings and construction measures to increase EE. Building materials; energy systems in buildings							
and increasing their efficiency. Energy audit and energy certificate.							

III. Competences

Generic competences

- 01. Independently use practical knowledge in designing elements to increase the energy efficiency of buildings;
- 02. Use software solutions for the calculation of heat inflows and losses;
- 03. Apply building materials in accordance with elements of energy efficiency.

Specific competences

01. Know how to identify the needs and demands of the contexts in which the application of methodological tools is required and learn to propose appropriate solutions for the research questions that emanate from the lines derived from the scope of energy efficiency.

02. Develop reasoning and critical thinking to perform analysis of energy efficiency reality through identification, description, and diagnosis of current energy efficiency problems close to the environment in which the student is using the tools provided by different methodologies, and that organizations use for their diagnosis.

03. Propose appropriate solutions based on the different problems studied.

IV. Contents VI.A. Syllabus

Chapter 1. General terms from energy efficiency in buildings, origins, and goals

Chapter 2. Design elements that affect the energy efficiency of buildings, traditional experiences, modern construction concepts,

Chapter 3. Elements of improving energy efficiency in residential buildings

Chapter 4. Elements of improving energy efficiency in business facilities



Chapter 5. State of	of the regulation (Legal frame	ework for energy effici	ency ii	n BiH and the	e EU)		
Chapter 6. Energy	y characteristics of the building (energy sources, energy consumption, energy Balance)						
Chapter 7. Buildir	ng materials and their ecolog	ical and energy charac	teristi	cs			
Chapter 8. Control of heat losses and inflows (heat losses, thermal bridges, building envelope)							
Chapter 9. Eacility heating (alternative energy sources)							
Chapter 10. Vent	Chapter 10. Ventilation and cooling (natural ventilation and artificial ventilation technical solutions)						
Chapter 11 Lighting of huildings							
Chapter 12. Com	nuter analysis models of ene	rev consumption softw	vare s	olutions			
Chanter 13 Energy	y inspection of the building	and energy certificate	vare s	oracions			
Chapter 14 Econ	omic development aspects o	f investing in energy ef	fficien	CV.			
Chapter 15 Press	entation of the design of the	low-energy facility	meren	cy			
Graphic and num	erical practices	low energy idenity					
Practical project (of energy-efficient family bui	lding:					
Practice 1 Buildin	a location analyses climate	orientation insolation	, wind	hs atc			
Practice 2 Flome	nts of building a functional o	rganization	i, wiiit	<i>is, etc.</i>			
Practice 3-5 Draf	t architectural design	Iganization					
Practice 6-10 Ma	in architectural design						
Practice 11 Build	ing energy balance						
Practice12 Mate	rials specification						
Practice13 Calcu	lations in Ki Expert or similar	software					
Practice 14 Use (of thermal imaging cameras	son element in impro	ving e	nergy efficie	ncv		
Practice 15 Resul	lts		ing c	nergy enterer	iley		
Practice 16 Press	antation						
IV B Training act	ivities						
TV:D: Training act	ivities		Doce	rintion			
Type			Dest		+- 0 A	andowia Autistan	
Reading	en anti-ina		Read	aing of repor	ts & A	cademic Articles	
Practical / Proble	m solving		Real	-case analysi	is (Cas	e-Study) and problem solvi	ng
Other			Sem	inars from in	dustr	y experts	
V. Student work	oad (hours)						
Lecture classes				30			
Practical classes/	problem-solving, case studie	s, etc.	15				
Practical sessions	in technological laboratories	s, hospitals, etc.	15				
Tests							
Academic tutoria	ls			5			
Related activities	: conferences, seminars, etc.			20			
Preparation of lea	cture classes			5			
Preparation of pr	actical classes, problem-solv	ing, case studies,etc.		15			
Test preparation				20			
Total student wo	rkload			125			
VI. Methodology	and academic program						
Туре		Period			Con	tent	
Theoretical Class	es	Week 1 to Week 15		Lectures, exposition and resolution of rese			tion of research
				works			
Practical Classes		Week 1 to Week 15		Practice resolution, cases, research			
			di			scussions/laboratory/simulations	
Seminars & exam		Week 17 to Week 20)	Seminars and exam			
VII. Assessment r	methods						
VII.A. Assessmen	t weighting						
Continuous ordir	arv assessment:						
The distribution a	and characteristics of the ass	essment tests are thos	e desc	rihed helow	Only	in excentional case and for	snecial reasons
may the teacher	add changes to the Guide. Th	ese changes will requi	re the	nrior consul	tation	with the Course Head and	the prior and
explicit authoriza	tion of the Degree Program (Coordinator who will r	notify t	the Vice-rect	or's o	ffice in charge of Academic	Affairs of the
modifications ma	de. In any case, the changes	proposed must consid	er the	stipulations	of the	verified report. For these	changes to take
effect they must	be duly communicated at th	e start of the course to	the s	tudents usin	σ Aula	Virtual	
The combination	of activities that are not re-a	issessable cannot exce	ed 509	% of the cour	se gra	de and ingeneral cannot	have a minimum
grade (except for	the case of laboratory or cli	nical work placements	where	e dulv justifie	ed) ar	nd tests which exceed 60%	of the course
protection and case of reported by of clinical work procentents, where dairy justified, and tests which exceed 00% of the course							
Extraordinary as	essment: Students who do r	not manage to nass the	ordin	ary assessm	ont o	r who did not attend will h	e subject to
completion of an extraordinary assessment to verify their acquisition of the skills established in the guide, only for activities that are re-							
accaccable							
Description of the tests for assessment and their weights							
A final own twill be taking along at the ond of the coming. The even will be FOV of the final grade, and the rast FOV or the							
continuous evaluation. The exam will take place in a physical class. Only if the situation at the moment does not allow it the evam will							
he online							
De Unime.							
	Verification method						l
				%		Term	
	Attendance at lectures			5		-	



	Attendance at exercises	5	-			
	Activity in class	10	-			
	Semester portfolio	30	-			
	Written exam	30	-			
	Oral exam	20				
VII.B. Assessmen	t of students with an academic exemption					
Student who wish	n to opt for this assessment will have to get an ac	ademic exemption for the	course, which they will hav	/e to request		
from the Dean or	Director of the Centre which teaches their course	e. An academic exemption	may be granted where the	e courses own		
characteristics all	ow for it.					
Course with the p	oossibility of an exemption: Yes					
VII.C. Review of a	assessment tests					
In accordance wit	th the exam appeal regulations of the University o	of Bihac.				
VII.DStudents w	vith a disability or special educational needs					
Curricular adapta	tions for students with a disability or special educ	ational needs will be dete	rmined by the Disabled Stu	Idents Support		
Department, in a	ccordance with the regulations governing the Disa	abled Students Support se	rvice, approved by the Univ	versity of Bihac o		
guarantee equal	opportunities, inclusive treatment, universal acce	ssibility and a greater guar	rantee of academic success			
For this purpose,	this Department will have to issue a curricular ad	aptation report, therefore	students with disabilities of	or special		
educational need	s must contact the Department to analyze the dif	ferent alternatives togethe	er.			
VII.EAcademic	pehavior, academic integrity, and honesty					
The University of	Bihac is completely committed to the highest sta	ndards of academic integr	ity and honesty. Therefore,	, studying at the		
University of Biha	ac means you accept and agree to the academic ir	ntegrity and honesty value	s described in the Universit	ty's Code of		
Ethics. To monito	r this procedure, the University has Regulations o	on academic behavior at th	e University of Bihac and u	ses different		
tools (anti-plagia	rism, supervision) which provides a collective assu	rance that these essential	values are completely dev	eloped.		
VII. Bibliography						
Generic Reference	ces					
1. Jovanović Pop	ović Milica: Bioklimatsko i ekološko projektovanje	e: urbanistički parametri. IF	P Zavet, 1994.			
Majdandžić Lju	ubomir: Obnovljivi izvori energije, Graphis Zagreb					
Specific Reference	ces					
1.Popović - Jovanović Milica; Zdravo stanovanje: Arhitektonika 1991.						
2. Rodríguez, M.	C., Villoria, P., Orellana, J., Ramiro, J., Morales,	G., & Melero, J. A. (2022	, October). CDA: IoT Digit	al and Intelligent		
Management Bu	Management Buildings for the Smart Campus project. In IECON 2022–48th Annual Conference of the IEEE Industrial Electronics					
Society (pp. 1-6).	Society (pp. 1-6). IEEE.					
IX.Lecturers/Tea	chers/Professors					
Lecturer/teacher	/professor´s name	AIDA HUSETIĆ				
E-mail address		ahusetic@gmail.com				
Area		Architecture and urban p	lanning			
Link						

3.4.3 Spatial Planning

SPATIAL PLANNING					
Туре	Compulsory				
Teaching period	Bachelor, 1 st semester				
ECTS credits	5				
Language	Bosnian				
II. Presentation					
Introduction to spatial planning. Urbanism. Spatial and urban	olan. Types of urban planning. Influential planning factors. The region and				
its borders. Planning and development of cities and settlemen	ts. Functional organization of the city territory. Residential zones and				
their structure. Ecology. Protection of natural values and urba	n standards. Basic terms, definitions and terminology in urban planning				
and spatial planning. Basics of geographic information systems	(GIS) and its role in spatial planning. Laws, regulations and other				
regulations. Types and composition of spatial plans, spatial pla	nning plans. History of cities and settlements. Geographical, functional				
and other factors of the origin and development of cities and s	ettlements. Structure of urban and rural settlements. Types of regions.				
Division of cities and towns. Spatial and urban analysis of a particular	t of the city. Spatial plan. Urban plan. Analysis of traffic flows in a part of				
the city. Analysis of space use. Analysis of the creditworthines	of buildings and premises. Analysis of the purpose of the facilities.				
III. Competences					
Generic competences					
01. After successfully completing the course, the stude	nt will be able to explain the basic concepts of spatial planning.				
02. Enumerate and explain the types of spatial plans ar	d levels of planning, as well as the legal framework in Bosnia and				
Herzegovina.					
03. They will know how to identify, differentiate and ex	plain spatial planning documentation needed for building construction.				
04. Basic knowledge of data collection and processing,	storage, analysis and presentation of geographical data in GIS				
Specific competences					
01. Connect spatial plans with concrete construction of	01. Connect spatial plans with concrete construction objects in and outside urban areas.				
02. Apply the elements of spatial relations when position	oning objects and the basic elements and spatial requirements of the				
building.					
IV. Contents					



VI.A. Syllabus Chapter 1. INTRODUCTION TO SPATIAL PLANNING 1.1. What is spatial planning 1.2. Definition of spatial planning 1.3. What is urban planning 1.4. What is urbanism 1.5. What does spatial planning do 1.6. Types of spatial plans 1.7. Types of spatial planning 1.8. Spatial planning documents Graphic practice 1. Basics of graphic presentation in spatial planning Chapter 2. MAIN TASK OF SPATIAL PLANNING 2.1. Basic principles, tasks and goals of space planning 2.2. Types of spatial plans in B&H 2.3. Urban plans 2.4. Implementation plans 2.5. Content of implementation plans 2.6. Factors affecting planning Graphic practice 2. Case study on a small scale environment (family house with garden and ancillary facilities) Chapter 3. HISTORICAL DEVELOPMENT OF URBANISM AND SPATIAL PLANNING 3.1. Antic city planning, Mesopotamian city, Greek agora, Roman forum 3.2. Industrial revolution and city planning 3.3. Le Corbusier Ville radieuse 3.4. Contemporary city planning Graphic practice 3. Larger scale- street with housing projects analysis - case study Chapter 4. URBANISM AND URBAN PLANNING 4.1. Urbanization 4.2. Tasks of urbanism 4.3 Cities Graphic practice 4. Larger scale- street with housing projects analysis - case study Chapter 5. BASICS OF GEOGRAPHIC INFORMATION SYSTEMS (GIS) AND ITS ROLE IN SPATIAL PLANNING 5.1. Basics of spatial data structure and GIS (SuperMap) 5.2. Data collection and processing, storage, analysis and presentation of spatial data in GIS (SuperMap) Practice 5. Practical application of GIS software (SuperMap) Chapter 6. DEVELOPMENT OF THE CITY 6.1. Pre-industrial period 6.2. Annular expansione 6.3. Radial cities 6.4. Linear cities Graphic practice 6. Analysis of the structure of the settlement on geodetic maps Chapter 7. FUNCTIONAL-SPATIAL STRUCTURE OF THE CITY 7.1. Narrow and wider urban area 7.2. Residential area, industrial zone, municipal-storage zone for rest and recreation 7.3 Spatial standards Graphic practice 7. Analysis of the residential zone of a small settlement, number of floors, function Chapter 8. SOCIAL-SPATIAL STRUCTURE OF THE CITY 8.1. Population density 8.2. Social cohesion Graphic practice 8. Graphic analysis of city zones on the cadastral records maps. Chapter 9. SOCIAL-SPATIAL STRUCTURE OF THE CITY 9.1. Population density 9.2. Social cohesion Practice 9. Numerical analysis of population density Chapter 10. TRAFFIC 10.1. Types of traffic 10.2. Traffic plans 10.3. Types of streets 10.4. Parking plans 10.5. Pedestrian zones and pedestrian roads 10.6. Squares Graphic practice 10. Analysis of traffic flows in a part of the city, graphic and practical Graphic practice 11. Parking plan Graphic practice 12. Street types drawings Chapter 11. SYSTEMS AND CONDITION OF SPACE 11.1. Hierarchy of spatial plans in Bosnia and Herzegovina 11.2. Development of spatial planning in Bosnia and Herzegovina 11.3. Medieval space organization in Bosnia and Herzegovina 11.4. Ottoman empire city organization 11.5. Austro-Hungarian spatial organization



11.6. Modern pla Graphic practice	nning 13. Analysis of the constructi	on quality of buildings	and p	remises			
Chapter 12. ENVI	Chapter 12. ENVIRONMENTAL PROTECTION IN SPATIAL PLANNING						
12.2. City as an ecosystem							
12.3. Aspects of t	12.3. Aspects of the protection of spatial entities						
12.4. National pa	12.4. National parks in Bosnia and Herzegovina						
12.5. Protected la	andscapes	on quality of buildings	and n	romicoc			
Chapter 13, FNGI	NFFRING OF THE CITIES	on quality of buildings	anu p	remises			
13.1. Undergrour	nd urbanism						
13.2. Infrastructu	ire system						
13.3. Waste dispo	osal						
13.4. Water purif	ying plants FECTION OF LIBBAN STANDAI						
14.1. Reconstruct	tion		LOLD				
14.2. City as an e	cosystem						
14.3. Aspects of t	he protection of spatial entit	ies					
14.4. National pa	rks in Bosnia and Herzegovin	a					
IV.B. Training act	livities		Doc	rintion			
Reading			Read	hing of report	ts & A	cademic Articles	
Practical / Proble	m solving		Real	-case analysi	s (Cas	e-Study) and problem solvi	ng
Other	0		Sem	inars from in	dustr	y experts	5
V. Student workl	oad (hours)						
Lecture classes				30			
Practical classes/	problem-solving, case studies	s, etc.		30			
Tests	in technological laboratories	s, nospitais, etc.		X			
Academic tutoria	ls			х			
Related activities	: conferences, seminars, etc.			25			
Preparation of lea	cture classes			Х			
Preparation of pr	actical classes, problem-solvi	ing, case studies,etc.		20			
Test preparation				20			
Total student wo	rkload	[125			
Type	and academic program	Period			Cont	tent	
Theoretical Classe	es	Week 1 to Week 15			Lectures, exposition and resolution of research works		
Practical Classes		Week 1 to Week 15			Practice resolution, cases, research		
<u> </u>					discussions/laboratory/simulations		
Seminars & exam	mothods	Week 17 to Week 20			Sem	inars and exam	
VII. A Ssessmen	it weighting						
Continuous ordir	nary assessment:						
The distribution a	and characteristics of the asso	essment tests are desc	ribed	below. Only i	in the	exceptional case and for sp	pecial reasons
may the teacher	add changes to the Guide. Th	nese changes will requi	re the	prior consult	tation	with the Course Head and	the prior and
explicit authoriza	tion of the Degree Program (Coordinator, who will n	otify	the Vice-rect	or's o	ffice in charge of Academic	Affairs of the
modifications ma	de. In any case, the changes	proposed must conside	er the	stipulations	of the	e verified report. For these	changes to take
The combination	of activities that are not re-a	e start of the course to issessable cannot exce	ed 509	% of the cour	se gra	i viituai. ade and, in general, cannot	have a minimum
grade (except for	the case of laboratory or clir	nical work placements,	wher	e duly justifie	ed), ar	nd tests which exceed 60%	of the course
weighting cannot	be added.						
Extraordinary as	sessment: Students who do r	not manage to pass the	ordir	ary assessme	ent, o	r who did not attend, will b	e subject to
completion of an extraordinary assessment to verify their acquisition of the skills established in the guide, only for activities that are re-							
assessavie. Description of the tests for assessment and their weights							
A final exam will	be taking place at the end of	the seminar. The exam	will b	be 50% of the	e final	grade, and the rest 60% co	mes from the
continuous evalu	ation. The exam will take pla	ce in a physical class. C	nly if	the situation	at th	e moment does not allow it	t, the exam will
be online.							
	verification method			%		Term	
	Attendance at lectures		_	5		-	
	Attendance at exercises			5		-	
	Activity in class			10		-	
	Semester portfolio			30		-	



	Written exam	30	-			
	Oral exam	20				
VII.B. Assessmer	t of students with an academic exemption					
The student who	wishes to opt for this assessment will have to get	an academic exemption f	or the course, which they v	will have to		
request from the	Dean or Director of the Centre which teaches the	ir course. An academic ex	emption may be granted w	here the		
courses' own cha	aracteristics allow for it.					
Course with the	possibility of an exemption: Yes					
VII.C. Review of	assessment tests					
In accordance wi	th the exam appeal regulations of the University o	f Bihac.				
VII.DStudents v	with a disability or special educational needs					
Curricular adapta	ations for students with a disability or special education	ational needs will be dete	rmined by the Disabled Stu	idents Support		
Department, in a	ccordance with the regulations governing the Disa	bled Students Support se	rvice, approved by the Univ	versity of Bihac o		
guarantee equal	opportunities, inclusive treatment, universal acces	sibility and a greater gua	rantee of academic success	5.		
For this purpose,	this Department will have to issue a curricular ada	aptation report, therefore	students with disabilities of	or special		
educational need	is must contact the Department to analyze the diff	erent alternatives togeth	er.			
VII.EAcademic	behavior, academic integrity, and honesty					
The University of	Bihac is completely committed to the highest star	ndards of academic integr	ity and honesty. Therefore	, studying at the		
University of Biha	ac means you accept and agree to the academic in	tegrity and honesty value	s described in the Universit	ty's Code of		
Ethics. To monito	or this procedure, the University has Regulations or	n academic behavior at th	e University of Bihac and ι	ises different		
tools (anti-plagia	rism, supervision) which provide a collective assur	ance that these essential	values are completely deve	eloped.		
VII. Bibliography						
Generic Referen	ces					
Marinović Uzelac	: A.: Prostorno planiranje; Dom i svijet, Zagreb, 200)1				
Specific References						
Jahić M.: Prostor	no planiranje i zaštita okoline; Tehnički fakultet Bil	nać 2004.				
IX.Lecturers/Tea	chers/Professors					
Lecturer/teache	r/professor´s name	AIDA HUSETIĆ				
E-mail address ahusetic@gmail.com						
Area		Architecture and urban	blanning			
Link						

3.5 European University of Tirana UET

European University of Tirana Modernization Proposal includes 3 courses (Table 13).

Table 13 - Proposal of Courses to modernize European University of Tirana

No/Partner	Cou	rse name (ECTS)	Level of study	% of the modernized courses compared to content included in the course	Number of students to be accepted in the first year	Category	EU & associated partners involved in providing support to modernize WB HEIIs courses
	01.	Architecture Technology (6)	Master - Integrated Diploma - (300 ECTS)	< 10%	25	Architecture and building design	UNI
	02.	Construction Sciences (6)	Bachelor (180 ECTS)/ Master - Integrated Diploma - (300 ECTS)	< 10%	25	Architecture and building design	UNI
11/UET	03.	Urban Design I (5)	Master (120 ECTS) / Master - Integrated Diploma - (300 ECTS)	< 10%	25	Spatial and urban planning	ΒΟΚՍ

3.5.1 Architectural Technology

ARCHITECTURAL TECHNOLOGY				
Туре	Compulsory			
Teaching period	3 rd year of integrated diploma in architecture, 1 st semester			
ECTS credits	6			
Language	Albanian			
II. Presentation				
The course focuses on the principals of architectural technologies, a discipline aimed at understanding the processes of implementation				
and transformation of the built environment, as well as methods and tools required to define, evaluate and control construction				



choices. The student will gain the basic knowledge needed to analyze and evaluate the construction systems and their elements,					
	0				
Generic competences					
01 Ability to explain the main traditional ar	d contomporary const	ruction systems			
02 Ability to mention and list the most com	mon construction mat	oriale			
03 Ability to explain the construction elem	ents and the methods	of analysis of thei	r performance		
Specific competences		of analysis of the	performance		
O1 Know how to propose structure and m	anaga dasign colutions	and huilding nor	formance according to the expected		
01. Know now to propose, structure, and m	lanage design solutions	and building per	formance, according to the expected		
requirements.		the desident of the second			
02. Know now to assess the combability of	Intervention solutions	with the built and	the natural environment, in the design,		
IV. Contents					
VI.A. Syllabus					
Topic 1. Technology as a general concept.	6 1 1 1				
Topic 2. Construction technology and the cou	rse of its development				
Topic 3. The close connection of architecture	development with the	advancement of	technology.		
Topic 4. The connection between the constru	ctive scheme, the func	tional scheme and	d the aesthetic solution in a building that is		
realized with a certain technology.					
Topic 5. Types of constructions and their char	acteristics.				
Topic 6. Nucleus b/a in these buildings.					
Topic 7. Foundations of buildings with b/a, sla	abs foundations 1.				
Topic 8. Foundations of buildings with b/a, slo	abs foundations 2.				
Topic 8. Architectural technology and nearly	zero-energy buildings				
Topic 9. Construction materials used in buildi	ngs with b/a, slabs four	ndations.			
Topic 10. Buildings with reinforced concrete s	skeletons 1.				
Topic 11. Buildings with reinforced concrete s	skeletons 2.				
Topic 12. Advantages and limitations of build	lings with reinforced co	oncrete skeletons			
Topic 13. The great influence of reinforced co	ncrete on the develop	ment of contemp	orary architecture 1.		
Topic 14. The great influence of reinforced co	ncrete on the develop	ment of contemp	orary architecture 2.		
Topic 14. Contemporary software and equipn	nent for architectural t	echnologies			
IV.B. Training activities					
Type Description					
Reading		Reading of acad	lemic articles and books related with the topics		
		treated during	the course.		
Practical / Problem solving		Real-case analy	sis (Case-Study) and problem solving/ Course tasks		
Other		Using the equip	ment for enhancing energy efficiency and		
		comfort, quality	y assurance and other contemporary architectural		
technologies					
V. Student workload (hours)					
Lecture classes		62,5			
Practical classes/problem-solving, case studie	s. etc.	30			
Practical sessions in technological laboratorie	s, hospitals, etc.	13			
Tests	-,,,	25			
Academic tutorials		10			
Polated activities: conferences, seminars, etc.		10			
Proparation of locture classes	•	- 10			
Preparation of recture classes		10			
Preparation of practical classes, problem-solv	ing, case studies,etc.	10			
Test preparation		12			
l otal student workload		150			
VI. Methodology and academic program					
Туре	Period		Content		
Theoretical Classes	Week 1 to Week 6		Lectures,		
Practical Classes	Week 1 to Week 6		Practice resolution, cases, research discussions		
			/simulations/ submission of the course task to		
			the students		
Week off for the preparation for the	ek off for the preparation for the Week 7 Preparation for the midterm exam				
midterm exam					
Midterm exam	Week 8		Midterm exam		
Theoretical Classes	Week 9 to Week 14		Lectures,		
Practical Classes	Week 9 to Week 14		Practice resolution, cases, research		
			discussions/simulations/submission of the		
			course task from the students		
Final exam	Week 15		Final exam		
VII. Assessment methods			· · · · · · · · · · · · · · · · · · ·		
VII.A. Assessment weighting					
Continuous ordinary assessment:					
Since this course is a typology II course the as	sessment is:				



Active participation in seminar classes (10%)				
Mid-term exam (30%)				
Course assignment (20%)				
Final exam (40%)				
Extraordinary assessment: Students who do not manage to pass t	he ordinary assessment, or who did not attend, will be subject to			
completion of an extraordinary assessment to verify their acquisit	ion of the skills established in the guide, only for activities that are re-			
assessable. For this course it would be:				
Active participation in seminar classes (10%)				
Course assignment (20%)				
Final exam (70%)				
Description of the tests for assessment and their weights				
A midterm exam that will be taking place at the 7 th week of the se	mester. The exam will be a 30% of final grade. The exam will take			
place in physical class. Only if the situation at the moment does no	ot allow it, the exam will be on line.			
A final exam that will be taking place at the 15 th week of the seme	ster. The exam will be a 40% of final grade. The exam will take place in			
physical class. Only if the situation at the moment does not allow	it, the exam will be on line.			
VII.B. Assessment of students with an academic exemption				
Student who will not be qualified due to the presence in the semi	nars are obliged to follow the course the following academical year.			
Course with the possibility of an exemption: Yes				
VII.C. Review of assessment tests				
In accordance with the regulation of the European University of Tirana.				
VII.DStudents with a disability or special educational needs				
Curricular adaptations for students with a disability or special educational needs will be determined based on the regulation of the				
European University of Tirana, approved by the Rector of the university to guarantee equal opportunities, inclusive treatment, universal				
accessibility, and a greater guarantee of academic success.				
For this purpose, this Department will have to issue a curricular adaptation report, therefore students with disabilities or special				
educational needs must contact the Department to analyze the different alternatives together.				
VII.EAcademic behavior, academic integrity, and honesty				
The European University of Tirana is completely committed to the highest standards of academic integrity and honesty. Therefore,				
studying at the European University of Tirana means you accept a	nd agree to the academic integrity and honesty values described in			
the University's Code of Ethics. To monitor this procedure, the Un	iversity has Regulations on academic behavior at the European			
University of Tirana and uses different tools (anti-plagiarism, supe	rvision) which provides a collective assurance that these essential			
VII. Bibliography				
Generic References				
Zvei N., Il nuovissimo manuale dell' architetto, Larteza, Roma 2010.				
Papanikolla I., Konstruksione arkitektonike 1, SHBLU, Tirana 2008.				
Papanikolla I., Konstruksione arkitektonike 2, SHBLU, Tirana 2008.				
Specific References	- 2004			
Del Nord R., Materiali e tecnologie dell'architettura, Larteza, Roma	a 2001.			
IX.Lecturers/ reachers/ Professors				
Lecturer/teacner/professor s name	ASSOC. Prot. PND. Silvana Sukaj			
E-mail address	silvana.sukaj@uet.edu.al			
Area				
Link <u>https://al.linkedin.com/in/silvana-sukaj-5801a789</u>				

3.5.2 Construction Sciences

CONSTRUCTION SCIENCES	
Туре	Compulsory
Teaching period	2 nd year of bachelor in civil engineering and architectre, 2 nd semester
ECTS credits	6
Language	Albanian
II. Presentation	
The course contains advanced notions of building constructions includes a reminder from the first module on basic elements an dimensioning of simple structures, mainly of statically determin statically undefined construction structures. The force method, (tra-column) as the two basic methods of calculating real constr the determination of mechanical parameters such as stiffness, the last part students will be introduced to seismic analysis of th and EC-8 as the most used codes in Albania for calculating struct	, continuing the science of constructions. The first part of the course d structures, kinematic analysis, construction of internal forces, and led systems. Students will then be introduced to the basic calculator on and the deformation method will be applied to frame type structures ruction structures. The main energy methods and their application for strength, ductility or global shrinkage of the structure will be studied. In he structure, the basics of calculating the structure according to KTP-89 tures.
III. Competences	
Generic competences	
01. Ability to explain the concept of kinematic analysis.	

Ability to explain the concept of kinematic analysis.
Ability to explain the concept of statistically defined and non-defined problems.
Ability to explain the concept of seismic engineering
Students apply their acquired knowledge and problem-solving skills in new or unfamiliar environments within broader (or multidisciplinary) contexts related to the area of the calculation of building loads and stability.



Specific competences				
01. Know how to make calculations based of	on the method of force	S.		
02. Know how to calculate the deformation				
03. Know how to make kinematic analysis o	f Structures, determina	ation of the degre	e of static	
indeterminacy.	indeterminacy.			
04. Know how to calculate structures for sta	ationary loads.			
05. Know how to calculate statically indeter	minate structures by t	he method of for	ces and the the mixed and combined method	
06. Make analysis based on the calculated v	values.			
IV. Contents				
VI.A. Syllabus				
Topic 1. General knowledge, statically defined	d systems, statically inc	leterminate syste	ms 1.	
Topic 2. General knowledge, statically defined	d systems, statically inc	leterminate syste	ms 2.	
Topic 3. Method of forces 1.				
Topic 4. Method of forces 2.				
Topic 5. Deformation method 1.				
Topic 7. Eluent lines 1				
Topic 8. Fluent lines 2.				
Topic 9. Knowledge about the structure dyna	mics 1.			
Topic 10. Knowledge about the structure dyn	amics 2.			
Topic 11. Seismic engineering 1.				
Topic 12. Seismic engineering 2.				
Topic 12. Basic requirements of nowadays an	ti seismic codes 1.			
Topic 14. Basic requirements of nowadays an	ti seismic codes 2.			
Topic 13. Structural analysis software 1.				
Topic 14. Structural analysis software 2.				
IV.B. Training activities				
Туре		Description		
Reading		Reading of acad	lemic articles and books related with the topics	
		treated during	the course.	
Practical / Problem solving		Real-case analy	sis (Case-Study) and problem solving / Course	
	tasks / Work in software			
Visits to building sites				
v. student workload (nours)				
Lecture classes		62,5		
Practical classes/problem-solving, case studie	es, etc.	30		
Tests		13		
lests		2,5		
Academic tutoriais		10		
Related activities: conferences, seminars, etc.		-		
Preparation of lecture classes	ing accostudios ato	10		
Preparation of practical classes, problem-solv	ing, case studies,etc.	10		
Test preparation		12		
		150	1	
VI. Methodology and academic program	Deried		Contont	
Theoretical Classes	Wook 1 to Wook 6			
Practical Classes	Week 1 to Week 0		Bractice resolution cases research discussions	
Flactical Classes	WEEK I LO WEEK O		/simulations/ submission of the course task to	
			the students	
Week off for the preparation for the	Week 7		Preparation for the midterm exam	
midterm exam				
Midterm exam	Week 8		Midterm exam	
Theoretical Classes	Week 9 to Week 14		Lectures	
Practical Classes	Week 9 to Week 14		Practice resolution, cases, research	
			discussions/simulations/submission of the	
			course task from the students	
Final exam	Il exam Week 15 Final exam			
VII. Assessment methods			·	
VII.A. Assessment weighting				
Continuous ordinary assessment:				
Since this course is a typology II course the as	sessment is:			
Active participation in seminar classes (10%)				
Mid-term exam (30%)				
Course assignment (20%)	Course assignment (20%)			
Final exam (40%)				



Extraordinary assessment: Students who do not manage to pass the ordinary assessment, or who did not attend, will be subject to			
completion of an extraordinary assessment to verify their acquisition of the skills established in the guide, only for activities that are re-			
assessable. For this course it would be:			
Active participation in seminar classes (10%)			
Course assignment (20%)			
Final exam (70%)			
Description of the tests for assessment and their weights			
A midterm exam that will be taking place at the 7 th week of the semester. The exam will be a 30% of final grade. The exam will take			
place in physical class. Only if the situation at the moment does not allow it, the exam will be on line.			
A final exam that will be taking place at the 15 th week of the semester. The exam will be a 40% of final grade. The exam will take place in			
physical class. Only if the situation at the moment does not allow it, the exam will be on line.			
VII.B. Assessment of students with an academic exemption			
Student who will not be qualified due to the presence in the seminars are obliged to follow the course the following academical year.			
Course with the possibility of an exemption: Yes			
VII.C. Review of assessment tests			
In accordance with the regulation of the European University of Tirana.			
VII.DStudents with a disability or special educational needs			
Curricular adaptations for students with a disability or special educational needs will be determined based on the regulation of the			
European University of Tirana, approved by the Rector of the university to guarantee equal opportunities, inclusive treatment, universal			
accessibility and a greater guarantee of academic success.			
For this purpose, this Department will have to issue a curricular adaptation report, therefore students with disabilities or special			
educational needs must contact the Department to analyze the different alternatives together.			
VII.EAcademic behavior, academic integrity, and honesty			
The European University of Tirana is completely committed to the highest standards of academic integrity and honesty. Therefore,			
studying at the European University of Tirana means you accept and agree to the academic integrity and honesty values described in			
the University's Code of Ethics. To monitor this procedure, the University has Regulations on academic behavior at the European			
University of Tirana and uses different tools (anti-plagiarism, supervision) which provides a collective assurance that these essential			
values are completely developed			
VII. Bibliography			
Generic References			
Pojani N., Skënderi S.,Teoria e strukturave, SHBLU, Tirana 1991.			
Pojani N., Sizmika, SHBLU, Tirana 2000.			
Skënderi S., Teoria e strukturave, SHBLU, Tirana 2000.			
Specific References			
Onate E., Structural analysis with F. E. M, Springer, London 2009.			
Timoshenko S. P., Yuong D. M., Theory of structures, Springer, London 2009			
IX.Lecturers/Teachers/Professors			
Lecturer/teacher/professor's name Assoc. Prof. PhD. Silvana Sukaj			
E-mail address silvana.sukaj@uet.edu.al			
Area LinkedIn			
ink https://al.linkedin.com/in/silvana-sukai-5801a789			

3.5.3 Urban Design I

URBAN DESIGN I				
Туре	Compulsory			
Teaching period	4 th year of integrated diploma in architecture, 1 st semester			
ECTS credits	5			
Language	Albanian			
II. Presentation				
The course of urban design 1 is divided into two basic dimensions. First, we have the theoretical dimension which consists of three sets of lectures, which constitutes the theoretical knowledge component, and it is controlled by two written tests. Second, we have the practical dimension in which students are trained to design the urban structural unit of the residential complex, or the productive structural unit of the industrial district. The course of lectures is divided into three sets of lectures: the set that takes care of familiarizing students with basic concepts of design and the process through which it is achieved, the urban redevelopment of existing urban units and the development of new urban units, the instruments of urban design, the second set aims to familiarize students with the residential complex as the basic unit of design and development of the residential center of the city and the industrial districts as the basic unit of design and the latest transport trends, the design of the transport system and the optimization of urban transport.				
Generic competences				
1. Ability to explain the concept of urban design, identify its p	 Ability to explain the concept of urban design, identify its processes, distinguish urban development and redevelopment. 			
2. Ability to identify and classify urban development control	instruments (PDV/ SUP, types of construction permits).			
Specific competences				
 Knowledge and implementation of the design of the road system. 	system and to classify ways of optimizing the urban road (transport)			



 Identification of the structural unit of housing and production, and implementation in practice of the design of a residential complex/ cell of the urban district.

IV. Contents

VI.A. Syllabus Topic 1. What is urban design?

In our first lecture, we will explore urban design as a multifaceted discipline that straddles theoretical concepts and practical administrative applications. We will delve into the unique position of urban design in the spectrum of spatial disciplines, establishing its intermediary role between urban planning and architecture. Our discussion will emphasize urban design's broad scope, focusing on the large-scale organization and configuration of urban spaces. We'll examine how it orchestrates the composition of buildings, the dynamic interplay of urban forms, and the vital spaces that interconnect them, rather than detailing individual building design. Furthermore, we will delineate key elements that set urban design apart from architectural design. These will include its expansive reach, encompassing entire neighborhoods and cities, and its visionary perspective, which often extends over significant temporal spans—typically ranging from 15 to 20 years. This comprehensive overview will set the foundation for understanding urban design's integral role in shaping sustainable, functional, and aesthetically coherent urban environments.

Topic 2. Urban design process, collaborative and integrative planning and development processes.

In our second lecture, we delve into the intricate process of urban design. We begin by recognizing that while each city is marked by its uniqueness and distinct challenges, there exist universal activities central to urban design that apply across various contexts. Students will learn about the shared stages of urban design, which include the systematic collection of data, the synthesis of this information into actionable insights, the rigorous evaluation of these insights, and the strategic implementation of developed plans. They will have an introduction to the "The New Leipzig Charter," a significant document in European urban development policy. Exploration of the charter's focus on integrative urban development, sustainability, resilience, and social inclusivity and discussion on integrating the principles of "The New Leipzig Charter" into the urban design process.

Moreover, the lesson will progress to uncover the political facets of urban design. Central to our exploration will be the concept of inclusivity — the vital process of engaging a diverse array of stakeholders. We'll discuss how the active participation of community members, affected individuals, and interest groups transforms urban design from a purely technical endeavor into a democratic and collaborative process. This shift underscores the importance of political acumen in urban design, as it becomes a tool for not just building spaces, but also for building consensus and community. Students will explore the methodologies and benefits of collaborative planning, the integration of interdisciplinary expertise, and the practices that ensure sustainable and inclusive urban environments. Topic 3. Partial urban studies/ detailed local plan.

In this lecture, we transition from a macroscopic, theoretical perspective on urban design to a practical, localized application of these principles. We aim to demonstrate how theoretical knowledge can be effectively employed to foster comprehensive and interactive urban design practices at a community level. The focus of the lesson is on the pivotal role of inclusivity and interaction within the urban design process, highlighting the multifaceted advantages that such an approach offers. We will explore the wide-ranging social, environmental, economic, and political dividends that are reaped from engaging in collaborative planning efforts that prioritize stakeholder involvement and community-centric strategies. By the end of this lesson, students will appreciate the tangible impacts of integrating theoretical understanding with participatory methods in the creation of cohesive urban spaces.

Topic 4 Project indicators of the detailed local plan and development, construction, infrastructure permits. In the upcoming lecture, we will delve into vital practical concepts that are foundational to crafting a comprehensive local plan or a segment of an urban study. The main aim is to ensure that our urban planning efforts are harmoniously integrated within the broader framework of territorial planning. Simultaneously, we strive to foster urban development that enhances the quality of life for the residents and users of the urban structures we envision. As part of a lecture series, we will highlight the contributions of Albanian urban design scholars. Our objective is to preserve and evolve the esteemed traditions of Albanian urban design by intertwining them with contemporary theoretical insights and practical methodologies from around the globe.

Topic 5. The residential complex as the basic unit of urban residential land use.

In this session, our attention will be centered on the theoretical concept of the Housing Complex as the foundational unit for designing residential land development. This lesson is a cornerstone of our course, as it meticulously details the key elements that define land use and the accompanying structures that shape the Housing Complex. We will dissect the interrelations of land use patterns and structural designs that culminate in creating a desirable living environment within a Housing Complex. While drawing on the expertise of Albanian scholars, we will bridge their insights with influential authors from global sources.

Topic 6. The industrial district as the basic unit of urban land use for production.

In our sixth lecture, we delve into the theoretical concept of industrial districts as a fundamental unit for designing zones dedicated to economic and industrial production. Drawing inspiration from international scholars, especially Alfred Marshall, who pioneered the idea of concentrated and collective development in manufacturing known as industrial districts, we will explore the defining characteristics and advantages of this approach to land development for production. We will examine the essential urban planning standards and guidelines necessary to ensure the functional, economic, and environmental sustainability of industrial districts. This lesson is crucial in challenging the urban development mentality of transitional cities that often overlook the crucial aspect of production, despite it being a human activity as fundamental as housing.

Topic 7. Suburban replanning (neo - traditional)

This lesson is crucial to the urban design curriculum, as it explores the concept of reimagining the layout of suburban urban areas. We will demonstrate how Albania's major cities have expanded into their peripheries through both formal and informal transitional developments, highlighting the invaluable lessons drawn from international theories and practices that can enhance the toolkit of aspiring urban designers. The lecture will delve into two fundamental principles of neotraditional design: firstly, the creation of dense, pedestrian-friendly, and mixed-use neighborhoods aimed at transitioning from greenhouse gas-emitting vehicles to human-powered movement and public transit systems; and secondly, ensuring that the design process is inclusive, actively engaging all stakeholders and community members impacted by urban development

Topic 8. City edge (Edge/ Satellite).

In this lesson, we'll explore the suburban neighborhood and the satellite city, which represent the other end of the urban design spectrum in contrast to neotraditionalism. While neotraditionalism offers a well-defined design philosophy, satellite urbanism lacks a singular design ethos. A hallmark of such peripheral development is the reliance on personal vehicles for transportation. Our focus will



be on the urgent need to transition from these car-centric models to urban designs that prioritize walking, cycling, and public transit, underscoring the imperative for energy-efficient urban transformation.

Topic 9. Redevelopment of the structural unit of the city (urban renewal).

This session will concentrate on the strategies for evolving existing urban structural units. We will tap into the American theories of urban redevelopment, reflecting on practices that encompass governance, economic, and environmental realms, and discuss their relevance to the Albanian context. The theoretical importance of this lesson lies in its contrast to the course's general emphasis on creating new housing complexes from the ground up, as it addresses the complex challenge of urban renewal within established districts. The core of this lesson will tackle two significant urban challenges highlighted by the post-World War II Urban Renewal project in the USA: firstly, the necessity of urban redevelopment towards a compact, mixed-use, pedestrian-friendly model, signifying a shift to human-powered and public transit energy systems; and secondly, the critical issue of involving all stakeholders in the redevelopment process to ensure inclusive and equitable urban growth.

Topic 10. Redevelopment of the structural unit of the city (community development).

n our tenth session, we will explore, with an emphasis on international practices an alternative approach to urban redevelopment through Community Development. This approach epitomizes a modern perspective on revitalization that not only seeks to enhance the urban living standard but also mandates inclusive decision-making, ensuring that planning outcomes are transparent and endorsed by the citizens who will be impacted by these developmental initiatives. As with the previous lesson, this topic holds significant contemporary relevance for urban development in Albania, echoing the initiatives such as the 'Urban Renaissance' that have been progressively adopted by the Albanian government in the past decade.

Topic 11. Housing planning.

This lesson will delve into housing, a foundational aspect of urban design and development. As future professionals, students will grapple with the complexities of housing provisions. Distancing from the narrow view of housing as merely social housing, as often seen in transitional societies like Albania, this lesson embraces a holistic perspective. Housing is conceptualized as the provision of adequate living space for all families, transcending socio-economic barriers. We will investigate the strategies and specific initiatives that planning authorities can employ to foster a vibrant housing market capable of accommodating the diverse needs of families, facilitating the universal objective of secure homeownership.

Topic 12. The last trends in urban transport.

Lecture twelve marks the commencement of our concluding series of lectures, focusing on urban transport, a pivotal element in urban land utilization. Alongside functional zoning, urban transport is instrumental in shaping the infrastructure of urban structural units and the overall cityscape. This lesson emphasizes the critical role of urban transport in modern urban development, advocating for a shift towards public and community transit systems over personal vehicles to conserve energy and minimize greenhouse gas emissions. The lecture will highlight emerging trends that advocate for an energy transition in public transportation, moving from fossil fuels to more sustainable, environmentally friendly energy sources."

Topic 13. Transport and energy planning and its process.

In this lesson, we turn our attention to the design of transportation systems and the intricate processes urban and transportation planners navigate to fulfill this fundamental aspect of city design. This is the second session in a series dedicated to transport, underscoring transportation planning as a core element of urban development. Effective circulation has long stood as a primary goal of planning, reflecting its vital role in shaping accessible, efficient, and sustainable urban environments. Students will engage with the principles of designing sustainable transport networks and developing energy strategies that support urban livability and environmental goals. Modern transportation planning is geared towards decreasing reliance on personal vehicles and enhancing the utilization of public transit systems. This strategic shift is seen as a fundamental approach to lowering energy consumption and fostering sustainable urban mobility.

Topic 14. Traffic system optimization.

In our concluding lesson, we'll explore strategies for enhancing the efficiency of current urban traffic systems without making structural road improvements. Historically, traffic engineers primarily focused on building physical transportation infrastructure. However, recent decades have seen a paradigm shift towards maximizing the efficiency of existing networks, extracting greater utility from the current roadway mileage. The overarching aim of this optimization is to curtail energy usage, with a particular emphasis on diminishing the reliance on fossil fuels.

IV.B. Training activities				
Туре		Description		
Reading		Reading of academic articles and books related with the topics		
		treated during the course.		
Practical / Problem solving		Real-case analysis (Case-Study) and problem solving/ Course tasks		
Other		-		
V. Student workload (hours)				
Lecture classes		62,5		
Practical classes/problem-solving, case studie	es, etc.	25		
Practical sessions in technological laboratories, hospitals, etc.		14		
Tests		1,5		
Academic tutorials		5		
Related activities: conferences, seminars, etc.		-		
Preparation of lecture classes		5		
Preparation of practical classes, problem-solving, case studies, etc.		5		
Test preparation		7		
Total student workload		125		
VI. Methodology and academic program				
Туре	Period		Content	
Theoretical Classes	Week 1 to Week 6	Lectures,		



Practical Classes	Week 1 to Week 6		Practice resolution, cases, research discussions		
			/simulations/ submission of the first course task		
			to the students		
Week off	Week 7		Preparation for the midterm exam		
Theoretical Classes	Week 9 to Week 14	1	Lectures		
Practical Classes	Week 9 to Week 14	1	Practice resolution, cases, research		
			discussions/simulations/submission of the		
			second course task from the students		
Final exam	Week 15		Final exam		
VII. Assessment methods					
VII.A. Assessment weighting					
Continuous ordinary assessment:					
Since this course is a typology II course the as	sessment is:				
Practical assignments (2 x 30% = 60%)					
Final exam (40%)					
Extraordinary assessment: Students who do	not manage to pass t	he ordinary assessn	nent, or who did not attend, will be subject to		
completion of an extraordinary assessment to	o verify their acquisiti	ion of the skills esta	blished in the guide, only for activities that are re-		
assessable. For this course it would be:					
Final exam (100%)					
Description of the tests for assessment and t	their weights				
A final exam that will be taking place at the 1	5 th week of the seme	ster. The exam will	be a 40% of final grade. The exam will take place in		
physical class. Only if the situation at the mor	ment does not allow i	it, the exam will be o	online.		
VII.B. Assessment of students with an acade	mic exemption				
Student who will not be qualified due to the p	presence in the semir	nars are obliged to f	ollow the course the following academical year.		
Course with the possibility of an exemption: Y	/es				
VII.C. Review of assessment tests					
In accordance with the regulation of the Euro	In accordance with the regulation of the European University of Tirana.				
VII.D. Students with a disability or special educational needs					
Curricular adaptations for students with a disability or special educational needs will be determined based on the regulation of the					
European University of Tirana, approved by the Rector of the university to guarantee equal opportunities, inclusive treatment, universal					
accessibility, and a greater guarantee of academic success.					
For this purpose, this Department will have to issue a curricular adaptation report, therefore students with disabilities or special					
educational needs must contact the Department to analyze the different alternatives together.					
VII.E. Academic behavior, academic integrity, and honesty					
The European University of Tirana is complete	ely committed to the	highest standards o	of academic integrity and honesty. Therefore,		
studying at the European University of Tirana	means you accept ar	nd agree to the acad	demic integrity and honesty values described in		
the University's Code of Ethics. To monitor th	is procedure, the Uni	iversity has Regulati	ons on academic behavior at the European		
University of Tirana and uses different tools (a	anti-plagiarism, supe	rvision) which provi	des a collective assurance that these essential		
values are completely developed					
VII. Bibliography					
Generic References			N 1/1 1 2017		
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Specific References					
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Aliaj B., Planifikimi urban, Volumi 1, Co Plan Ir	nstitute for habitat de	evelopment, Tiranë	2003.		
Aliaj B., Planifikimi urban, Volumi 2, Co Plan Ir	nstitute for habitat de	evelopment, Tiranë	2003.		
Belussi F., Caldar K., At the origin of the indus	trial district: Alfred N	larshall and the Car	nbridge Scholl, Cambridge Journal of Economics,		
London 2009.					
Aliaj B., Misteri i gjashtë, Botime Afrojdit, Tirana 2008.					
Faja E., Alimehmeti F., Urbanistika 1, Tirana University, Tirana 1983.					
European Union. The New Leipzig Charter. The Transformative Power of Cities for the Common Good; EU2020.de. European					
Commission: Brussels, Belgium, 2020					
IX.Lecturers/leachers/Professors					
Lecturer/teacher/professor's name	Lecturer/teacher/professor's name PhD. Gentian Kaprata				
E-mail address		gentian.kaprata@	<u>uet.eau.al</u>		
Area					
Link		<u>nttps://al.linkedin</u>	.com/in/gentian-kaprata-75b2b729		

3.6 Polytechnic University of Tirana UPT

Polytechnic University of Tirana's Modernization Proposal includes 5 courses (Table 14):

Table 14 - Proposal of courses to modernize Polytechnic University of Tirana



Report on modernization of university courses in collaboration with industry sector

No/Partner	Cour	rse name (ECTS)	Level of study	% of the modernized courses compared to content included in the course	Number of students to be accepted in the first year	Category	EU & associated partners involved in providing support to modernize WB HEIIs courses
	01.	General Geodesy 1 (6)	Bachelor (180 ECTS)	< 20%	45	Geodesy and analysis	UNIZG
	02.	General Geodesy 2 (7.5)	Bachelor (180 ECTS)	< 20%	45	Geodesy and analysis	UNIZG
	03.	Knowledge of urban planning and projects (4)	Master	< 20%	15	Spatial and urban planning	воки
	04.	Topographic surveys and State Geodetic networks 1 (6)	Bachelor (180 ECTS)	< 20%	45	Geodesy and analysis	UNIZG
12/UPT	05.	Topographic surveys and State networks 2 (7.5)	Bachelor (180 ECTS)	< 20%	45	Geodesy and analysis	UNIZG

3.6.1 General Geodesy 1

Course & Subject identification: General Geodesy 1			
Туре	Compulsory		
Teaching period	Year 1, 1 st semester		
	Credits: 6		
	Number of classroom teaching hours: 82.5		
	Lecturing: 3		
ECTS credits	Practice/exercise/Seminars: 1		
	Project: 0.5		
	Laboratory work: 15		
Language	Albanian		
II. Presentation	1.00.000		
The course serves for the recognition and acquisition by stude	nts of basic concepts and theoretical knowledge of Geodesy, familiarize		
with terrestrial geodetic instruments and gain skills in using those	in instruments applying different geodetic methods for measuring angles.		
distances and height differences for determination of position a	nd height of points on Earth surface.		
In the first semester, students learn what the geodesy is, basic c	concepts related to the geometry of the earth, coordinate systems in plan		
and height, basic elements such as horizontal/vertical angles,	distances and the differences of heights, equipment, and measurement		
technology in geodesy, what are the topographic plans and map	os, etc.		
III. Competences			
Generic competences			
01. Be able to communicate effectively and present professional work in oral and written form.			
02. Be able to work in groups and manage professional (simple) projects.			
03. Be aware of some legal, ethical, economic and environmental issues relevant to the geodetic profession.			
04. Be able to apply existing modern technology to solve complex professional projects.			
Specific competences			
Knowledge and Understanding			
1. Students will be able to explain mathematical and physical	foundations of positioning, mapping, data processing and georeferencing.		
2. Students will understand which surveying method to imple	ement for solving geodetic problems.		
Practical Skills			
1. Be able to carry out different types of classical field measu	irements.		
2. Be able to perform processing of collected measurement of	data with accuracy and reliability indicators.		
3. Be able to structure and visualize results of applied survey	ing methods.		
Intellectual skills.			
Be able to choose proper methods for data acquisition and Be able to evolve a proper methods for data acquisition and	a analysis.		
2. Be able to evaluate possibilities and initiations of existing 2. Be able to identify the poods of new methods and technol	aging for existing and future problems		
S. Be able to identify the needs of new methods and technol	ogies for existing and future problems.		
IV. Contents			
Week 1: The Earth shane and size. Earth shane presentation – fr	com plate to gooid, torrectrial		
ellinsoid units of geodetic measurements. Orthogonal	and nolar coordinate system		
Point heights.			
Week 2: Methodology of angular measurements (H. 7), processi	ng and evaluation of measurement results.		
Week 3: Influence of errors on angular measurements. Knowled	lge of angular geodetic measuring instruments.		



Week 4: The distance measurement methods. Direct and optical methods. Measuring distances by physical methods.						
Week 5: Determining of the coordinates x, y. The right and opposite task of geodesy.						
Week 6: Directional angles and their relation to other orientations.						
Week 7: Height types and systems. Mean Sea	Level; Critters	for	establishing	g tide	gauges;	Levelling
Networks.						
Week 8: Levels constructive elements (Levelling/Rea	ading systems	of	levels.	Determina	tion of	heights
by spirit leveling.						
Week 9: Determination of levels by trigonometric levelling. Determin	nation of levels by	geome	etric			
levelling of technical accuracy.						
Week 10: Accuracy and reliability, field control methods and the use	of the technical l	evelling				
Week 11: Map definition, cartographic projections. Plan and topogra	aphic maps and th	ieir				
classification. Plan and topographic maps, classification. Ele	ements of the top	ographi	c map			
content. Map generalization.						
Week 12: Usage topographic maps and plans. Difference between p	aper and digital m	iaps.				
Modernization Detail:						
- Lecture in Week 1 – 25%						
- Lecture in Week 7 – 25%						
- Lecture in Week 11 – 50%						
- Lecture in Week 12 – 50%						
- Percentage of course modernization: 12,5%						
Explanation what we would like to improve:						
The course delivers basic knowledge on geodesy and terrestrial surv	eying methods wi	th suffi	cient time fo	reseen for	practical e	xercise so
that beside theory students can gain necessary skills in using terrest	rial geodetic instru	ument.	Respective k	nowledge	and skills s	hould be
adjusted to newest developments in instrumental technique, resulti	ng also in modern	ization	of skills nece	essary to u	se those in	struments
and implement the methods (digital technology transformed also ge	odetic instrumen	ts).				
Usage of mechanical optical and digital electro-optical instruments v	will provide stude	nts insig	ght into diffe	rence betv	veen classi	cal and
modern instruments and effects on methods and results which can l	be achieved.					
Note:						
Ability to perform spatial analysis using Geographic Information Syst	tems (GIS), should	be rem	noved from g	ained prac	tical skill	
competence since course does not include any lecture or practical e	xercise related to	GIS.				
V. Student workload (hours)						
Lecturing	39					
Seminars	11					
Project	10					
Laboratory work/ 7.5						
Practical work, problem-solving, case studies, etc.						

Total student workload

Student participation in learning

The learning process provided in the curriculum of the course includes lectures, seminars/exercises, laboratory works, consultations, assignments/course project, and teaching practice.

Attendance in the different forms of learning is determined in accordance with the regulation of UPT for the development of curricula and teaching, according to article 29:

67.5

- attending lectures is mandatory, no less than 75% of the number of sessions held.
- attendance at seminars and exercises is mandatory, no less than 75% of the number of sessions held.
- attendance at laboratory works, and practical works is completely mandatory to the extent of 100%.

When the student, with or without reason, does not participate in more than 25% of the number of sessions held in a course, he is declared unclassified and is not allowed to pay off the further obligations of that course. He is obliged to follow the forms of learning again in the following year, with the same attendance duty.

VI. Methodology and academic program					
Туре	Period	Content			
Theoretical Classes	Week 1 to Week 10	Lectures, exposition and resolution of research			
		works			
Seminars/	Week 1 to Week 12	Seminars, Practice cases, research discussions/			
Laboratory work	Week 1 to Week 12	Laboratory work.			
Practical work/	Week 13/				
Exam	Week 14				

VII. Assessment methods

Assessment of student's knowledge on the base of the learning outcomes, skills and competences are to be in accordance with the Albanian 10-grade rating system (from 1 to 10, where 10 is the maximum rating and marks from 5 and above are passing) defined by Education Regulation of Polytechnic University of Tirana:

Local Mark	Points	Grade	Definition
10 Excellent	91 ÷ 100	А	outstanding performance with only minor errors



9 Very good	84 ÷ 90	В	above the average standard but with some errors	
8 Good	75 ÷ 83	С	generally sound work with a number of notable errors	
7 Satisfactory	65 ÷ 74	D	fair but with significant shortcomings	
6 Adequate performances	55 ÷ 64	E	performance meets the minimum criteria	
5 Acceptable	45 ÷ 54	FA	performance meets the minimum criteria (Passed exam)	
4 Insufficient	< 45	FX	Fail - further work required	
VII.1 Description of the t	ests for assessme	nt and their w	eights	
The knowledges control	and assessment sy	stem include	defenses of laboratory work, defenses of assignments and/or course projects,	
defenses of teaching prac	ctices, and midterr	n exams.		
A final exam that will be	taking place at the	ne end of the	semester. The exam will be a 70% final grade, the rest 30% comes from the	
evaluation of 100% partic	cipation in lectures	; (10%), from 1	100% participation in seminars and laboratories (10%), and from evaluating the	
results of practical and la	boratory work (10	%). The exam	will take place with physical presence in the classroom, except for specific cases	
that do not allow it, such	as Covid-19, etc.,	the exam will l	pe online.	
Students have the right to appeal for the evaluation of the test.				
Curricular adaptations for students with a disability or special educational needs will be determined in accordance with the regulations in				
force of the UPT and the Ministry of Education.				
VII.2 Academic behavior, academic integrity, and honesty				
Polytechnic University of Tirana (UPT) is fully committed to the highest standards of academic integrity and honesty. Commitment to UPT				
means that you accept the values of academic integrity and honesty described in the University's Code of Ethics. To monitor this				
procedure, UPT has Regulations on academic behavior and uses different various tools (anti-plagiarism, supervision) which provides a				
collective assurance that	collective assurance that these core values are fully developed.			
VII. Bibliography				
1. E. Bejko, Gjeodezia e p	ërgjithshme 1. 201	.2, Reklama. IS	BN - 978-9928-125-56-9	
2. M. Dragovoja Gjeodezia I,II, Tirane, 1985.				
3. Bomford, Geodezy, New York, 1983.				
4. J. Anderson, E.Michail: Surveying, New York, 1998.				
5. Martin Vermeer, Geodesy, 2018.				
IX.Lecturers/Teachers/Pi	rofessors			
Lecturer/teacher/profes	sor's name		Dr. Sc. Ethem Bejko PhD	
E-mail address			bejko_ethem@hotmail.com,	
			ethem.bejko@fin.edu.al	
Area Geodesy			Geodesv	

3.6.2 General Geodesy 2

Link

Course & Subject identification: General Geodesy 2		
Туре	Compulsory	
Teaching period	Year 1, 2 nd semester	
	Credits: 7.5	
	Number of classroom teaching hours: 105	
	Lecturing: 3	
ECTS credits	Practice/exercise/Seminars: 1	
	Project: 1	
	Laboratory work: 1.5	
	Practical Training: 1	
Language	Albanian	
II Presentation		

In the second semester, following course General geodesy I, students will finalize process of becoming acquainted with basic geodetic measurement methods (polygonometry) and focus on definition and concepts of different geodetic networks and the ways of network densification, as well as will learn calculations of geodetic points according to the different schemes and methods, laying out all the problems for the later years.

III. Competences

Generic competences

1. Be able to communicate effectively and present professional work in oral and written form.

2. Be able to work in groups and manage professional (simple) projects.

3. Be aware of some legal, ethic, economic and environmental issues relevant to geodetic profession.

4. Be able to apply existing modern technology to solve complex professional projects.

Specific competences





Knowledge and understanding

1. Mathematical foundations of geodetic networks and positioning, mapping, data processing and georeferencing. Practical skills

- 1. Be able to carry out different types of field measurements
- 2. Be able to process collected measurement data
- 3. Be able to structure, visualize and interpret achieved results.
- Intellectual skills
- 1. Be able to choose proper methods for data acquisition and analysis.
- 2. Be able to evaluate possibilities and limitations of existing technologies for specific application areas.
- 3. Be able to identify the needs of new methods and technologies for existing and future problems.

IV. Contents

VI.A. Syllabus

Week 1: Polygonometry and the impact of errors.

- Week 2: Polygonometry design, field reconnaissance, point fixing and signaling.
- Week 3: Determining the coordinates in the systems of separate polygons, their preliminary
 - evaluation.
- Week 4: Compensation for polygonometry in open polygon systems with one or more node points and their evaluation.
- Week 5: Determining coordinates in closed polygon systems and evaluating them.
- Week 6: Geodetic interruptions and their evaluation.
- Week 7: Differential equation of direction angle. Multiple geodetic interruptions, their evaluation.
- Week 8: Analytical networks, accuracy, main parameters, treatment of initial data, their

evaluation.

- Week 9: Design of analytical networks, field reconnaissance, point fixing and signaling.
- Week 10: Simplified compensations. Solving the geodetic quadrilateral and the central system.
- Week 11: Determining the heights of points in different spatial situations.
- Week 12: Transformation of heights between systems and in time.

Modernization:

- All lectures modernized in context of usage of modern instrumental and sensor technology
- Practical exercises in Week 13 and 14 modernized in context of usage of modern instrumental and sensor technology
- Percentage of course modernization: 20%

Explanation what we would like to improve:

This course continues to deliver, following course General geodesy I, basic knowledge on geodesy and terrestrial surveying methods with sufficient time foreseen for practical exercise so that beside theory students can gain necessary skills in using terrestrial geodetic instrument. Respective knowledge and skills should be adjusted to newest developments in instrumental technique, resulting also in modernization of skills necessary to use those instruments and implement the methods (digital technology transformed also geodetic instruments).

Usage of mechanical optical and digital electro-optical instruments will provide students insight into difference between classical and modern instruments and effects on methods and results which can be achieved.

Note:

Ability to perform spatial analysis using Geographic Information Systems (GIS), should be removed from gained practical skill competence since course does not include any lecture or practical exercise related to GIS!

V. Student workload (hours)				
Lecturing		39		
Seminars		11		
Project		20		
Laboratory work/		7.5		
Practical work, problem-solving, case studies,	etc.	5		
Total student workload		82.5		
VI. Methodology and academic program				
Туре	Period		Content	
Theoretical Classes	Week 1 to Week 10		Lectures, exposition and resolution of research works	
Seminars/ Laboratory work	Week 1 to Week 12		Seminars, Practice cases, research discussions/ Laboratory work.	
Practical work/ Exam	Week 13/ Week 14		Practical work and exam	

Student participation in learning

The learning process provided in the curriculum of the course includes lectures, seminars/exercises, laboratory works, consultations, assignments/course project, and teaching practice.

Attendance in the different forms of learning is determined in accordance with the regulation of UPT for the development of curricula and teaching, according to article 29:

- attending lectures is mandatory, no less than 75% of the number of sessions held.
- attendance at seminars and exercises is mandatory, no less than 75% of the number of sessions held.
- attendance at laboratory works, and practical works is completely mandatory to the extent of 100%.

When the student, with or without reason, does not participate in more than 25% of the number of sessions held in a course, he is declared unclassified and is not allowed to pay off the further obligations of that course. He is obliged to follow the forms of learning again in the following year, with the same attendance duty.

VII. Assessment methods

smart**WB**

Assessment of student's knowledge on the base of the learning outcomes, skills and competences are to be in accordance with the Albanian 10-grade rating system (from 1 to 10, where 10 is the maximum rating and marks from 5 and above are passing) defined by Education Regulation of Polytechnic University of Tirana:

Local Mark	Points	Grade	Definition
10 Excellent	91 ÷ 100	А	outstanding performance with only minor errors
9 Very good	84 ÷ 90	В	above the average standard but with some errors
8 Good	75 ÷ 83	С	generally sound work with a number of notable errors
7 Satisfactory	65 ÷ 74	D	fair but with significant shortcomings
6 Adequate performances	55 ÷ 64	E	performance meets the minimum criteria
5 Acceptable	45 ÷ 54	FA	performance meets the minimum criteria (Passed exam)
4 Insufficient	< 45	FX	Fail - further work required
VII.1 Description of the te	ests for assessme	nt and their w	eights
The knowledges control and assessment system include defenses of laboratory work, defenses of assignments and/or course projects, defenses of teaching practices, and midterm exams. A final exam that will be taking place at the end of the semester. The exam will be a 70% final grade, the rest 30% comes from the evaluation of 100% participation in lectures (10%), from 100% participation in seminars and laboratories (10%), and from evaluating the results of practical and laboratory work (10%). The exam will take place with physical presence in the classroom, except for specific cases that do not allow it, such as Covid-19, etc., the exam will be online. Students have the right to appeal for the evaluation of the test. Curricular adaptations for students with a disability or special educational needs will be determined in accordance with the regulations in force of the UPT and the Ministry of Education. VII.2 Academic behavior, academic integrity, and honesty Polytechnic University of Tirana (UPT) is fully committed to the highest standards of academic integrity and honesty. Commitment to UPT means that you accept the values of academic integrity and honesty described in the University's Code of Ethics. To monitor this			
collective assurance that these core values are fully developed.			
 VII. Bibliography E. Bejko, Gjeodezia 2, Poligonometria, Nderprerjet dhe Rrjetet Gjeodezike, 2014. M. Dragovoja, Gjeodezia II (Poligonometria), Tirane, 1985. M. Dragovoja , Gjeodezia III (Nderprerjet dhe Rrjetet gjeodezike), Tirane, 1985. P. R. Wolf, Adjustment Computations, USA, 1997. Martin Vermeer, Geodesy, 2018. 			
IX.Lecturers/Teachers/Pr	ofessors		
Lecturer/teacher/profess	sor's name		Dr. Sc. Ethem Bejko PhD
E-mail address			bejko_ethem@hotmail.com,
			ethem.bejko@fin.edu.al
Area			Geodesy
Link			

3.6.3 Knowledge of urban planning and projects

Course & Subject identification: Knowledge on planning and urban projects		
Туре	Selective	
Teaching period	Year 4, 2 nd semester	
	Credits: 4.0	
	Number of classroom teaching hours: 37	
	Lecturing: 2	
ECTS credits	Practice/exercise/Seminars: 1	
	Project: 1	
	Laboratory work: 0	
	Practical Training: 0	
Language	Albanian	
II. Presentation		

After this course student will have knowledge	about:					
- Planning and urban plans. Theory of planning	g and interpretation of	f urban projects.				
- Presentations and analysis of urban building	s, terrain, constructior	n site, inventory, id	entification of urban elements, etc.			
- Legislation, territorial planning law and regul	lations, as well as plan	ning projects throu	ugh GIS.			
		0. 7				
III. Competences						
Generic competences						
1. Be able to communicate effectively and	present professional a	nd scientific work	in oral and written form.			
2. Be able to work in groups and manage p	rofessional (simple) ar	nd scientific projec	ts.			
3. Be aware of some legal, ethic, economic	and environmental is	sues relevant to ge	odetic profession.			
Specific competences						
After completing the Program of "Master of S	Science in Geodesy", a	a student should o	btain competences and skills needed to work as a			
professional geodesist, including the following	g competences.					
Knowledge and understanding						
- Mathematical and physical foundations of p	ositioning, design app	ropriate geodetic i	networks, mapping, data processing analyzing and			
geo- referencing.						
Practical skills	a a cura manta in aludin	a proposing of col	lasted management data with accuracy analyzing			
- Be able to carry out different types of field if	information	g processing of col	iected measurement data with accuracy analyzing.			
- Be able to structure and visualize geospatial	ial analysis using Geog	ranhic Information	Systems (GIS) and other software tolls			
Intellectual skills						
- Be able to choose proper methods for data a	equisition and analysi	s.				
- Be able to evaluate possibilities and limitation	ons of existing technolo	ogies for specific ap	oplication areas.			
- Be able to identify the needs of new method	ls and technologies for	existing and futur	e problems.			
- Be able to apply existing modern technology	y to solve complex pro	fessional projects.				
IV. Contents						
VI.A. Syllabus						
Week 1: Introduction to Urban Design and De	velopment. Planning F	Principles.				
Week 2: Reading and interpretation of urban	plans.					
Week 3: Planning Concepts. Generic Planning	Process, analysis, alte	rnatives, and evalu	uation plan. Identifying the problems, institutional			
involvement, and definition of goals.	involvement, and definition of goals.					
Week 4: Analysis of an urban design, analysis.	development proposa	als. road network.	etc.			
Week 5: Presentation of residential centers/ci	ity centers: heritage n	rotection: the new	era of residential centers/city centers planning			
week 5. Presentation of residential centers/city centers; nentage protection; the new era of residential centers/city centers planning.						
Week 7: Analysis of the construction site and	d inventory identifica	tion of urban alon	ponts access mobility facilitating the sizulation			
week /: Analysis of the construction site and inventory, identification of urban elements, access, mobility, facilitating the circulation,						
integration of elements, etc.						
week 8: Transportation Planning, bases of the	e design of the road he	etwork, road syster	ns, Classifying of roads, their elements, etc.			
Week 9: Legislation, territorial planning law ai	nd regulations.					
Week 10: GIS, addressing and planning projec	ts through Geographic	: Information Syste	ms.			
Week 11: Current planning and design trends	represented in innova	tive settlements. A	Aspects of surveying works.			
Week 12: Nationwide land use planning progr	ams. Sustainability Pla	inning.				
V. Student workload (hours)						
Lecturing		30				
Seminars		13				
Project		20				
Laboratory work/		0				
Practical work, problem-solving, case studies,	etc.	0				
Total student workload	[63				
VI. Methodology and academic program	Daviad		Constant			
Туре	Period					
Theoretical Classes	Week 1 to Week 10		Lectures, exposition and resolution of research			
Seminars/			Seminars Practice cases research discussions/			
Laboratory work	Week 1 to Week 12		laboratory work			
Practical work/	Week 13/					
Exam	Week 14		Practical work and exam			
•			•			

Student participation in learning

The learning process provided in the curriculum of the course includes lectures, seminars/exercises, laboratory works, consultations, assignments/course project, and teaching practice.

Attendance in the different forms of learning is determined in accordance with the regulation of UPT for the development of curricula and teaching, according to article 29:

- attending lectures is mandatory, no less than 75% of the number of sessions held.
- attendance at seminars and exercises is mandatory, no less than 75% of the number of sessions held.
- attendance at laboratory works, and practical works is completely mandatory to the extent of 100%.



When the student, with or without reason, does not participate in more than 25% of the number of sessions held in a course, he is declared unclassified and is not allowed to pay off the further obligations of that course. He is obliged to follow the forms of learning again in the following year, with the same attendance duty.

VII. Assessment methods

Assessment of student's knowledge on the base of the learning outcomes, skills and competences are to be in accordance with the Albanian 10-grade rating system (from 1 to 10, where 10 is the maximum rating and marks from 5 and above are passing) defined by Education Regulation of Polytechnic University of Tirana:

Local Mark	Points	Grade	Definition
10 Excellent	91 ÷ 100	A	outstanding performance with only minor errors
9 Very good	84 ÷ 90	В	above the average standard but with some errors
8 Good	75 ÷ 83	С	generally sound work with a number of notable errors
7 Satisfactory	65 ÷ 74	D	fair but with significant shortcomings
6 Adequate	55 + 64	E	performance mosts the minimum criteria
performances	55.04	L	performance meets the minimum citteria
5 Acceptable	45 ÷ 54	FA	performance meets the minimum criteria (Passed exam)
4 Insufficient	< 45	FX	Fail - further work required
VII.1 Description of the te	ests for assessmer	nt and their we	eights
The knowledges control a	and assessment sy	stem include o	defenses of laboratory work, defenses of assignments and/or course projects,
defenses of teaching prac	ctices, and midtern	n exams.	
A final exam that will be	taking place at th	ne end of the	semester. The exam will be a 70% final grade, the rest 30% comes from the
evaluation of 100% partic	cipation in lectures	(10%), from 1	00% participation in seminars and laboratories (10%), and from evaluating the
results of practical and lal	boratory work (109	%). The exam v	vill take place with physical presence in the classroom, except for specific cases
that do not allow it, such	as Covid-19, etc., 1	the exam will b	be online.
Students have the right to	o appeal for the ev	aluation of the	e test. A sigl a durantia and a said har data and in a second second the data with the second stime.
Curricular adaptations for students with a disability or special educational needs will be determined in accordance with the regulations			
In force of the OPT and the Ministry of Education.			
VII 7 Acadomic bobavior	acadomic intogrit	w and honoct	M
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3.6.4 Topographic surveys and State Geodetic networks 1

Course & Subject identification: Topographic Surveying and State Geodetic Networks 1		
Туре	Compulsory	
Teaching period	Year 2, 1 st semester	
	Credits: 7.5	
	Number of classroom teaching hours: 107.5	
	Lecturing: 4	
ECTS credits	Practice/exercise/Seminars: 0.5	
	Project: 0.5	
	Laboratory work: 2.5	
	Practical Training: 0	
Language	Albanian	
II. Presentation		



The course serves to familiarize and acquaint students with the basic theoretical concepts and knowledge of Geodesy related to the processes of surveying in geodesy.

The course "Topographic Surveys and Geodetic Networks I" is intended to give and acquaint students with methods of direct and state topographic surveys, the main requirements. Field and camera work processes, related calculations and original evaluation of the topographic plan drawn up. Traditional and modern survey methods using "Total stations". General knowledge on state surveys for obtaining 1: 10000 and 1: 25000 baseline maps. Updating maps and topographic plans, etc.

Precondition for this course is mastered course on basic GIS (Geographic Information Systems) knowledge and skills.

III. Competences

Generic competences

- 1. Be able to communicate effectively and present professional work in oral and written form.
- 2. Be able to work in groups and manage professional (simple) projects.
- 3. Be aware of some legal, ethical, economic and environmental issues relevant to geodetic profession.
- 4. Be able to apply existing modern technology to solve complex professional projects.

Specific competences

Knowledge and understanding

1. Mathematical and physical foundations of positioning, mapping, data processing and georeferencing. Practical skills

- 1. Be able to carry out different types of field measurements including processing of collected measurement data.
- 2. Be able to structure and visualize geospatial information.
- 3. Be able to perform spatial analysis using Geographic Information Systems (GIS).

Intellectual skills

- 1. Be able to choose proper methods for data acquisition and analysis.
- 2. Be able to evaluate possibilities and limitations of existing technologies for specific application areas.
- 3. Be able to identify the needs of new methods and technologies for existing and future problems.

IV. Contents

VI.A. Syllabus

Week 1: Orthogonal survey, support network construction.

Week 2: Drafting the topographic plan.

Week 3: Tachometric survey, survey process, geodetic network.

- Week 4: Drafting the topographic plan.
- Week 5: Accuracy of determining point details.

Week 6: Advanced methods in geodetic surveys.

Week 7: Use of total stations in topographic surveys.

- Week 8: Digital topographical information system and databases. Difference between
- topographic and carotographic database. Concept and standards.
- Week 9: Design of topographic database and plan through digital method. Components of

topographic database.

Week 10: State topographic surveys of scales 1: 10 000 and 1: 25 000.

Week 11. Ways of updating topographical database content. Update topographic plans and maps.

Week 12: Topographical database – source of multifunctional products, official and user specific – tailor made for different application.

Modernization Detail:

- Lecture in Week 8 50%
- Lecture in Week 9 50%
- Lecture in Week 12 100%
- Percentage of course modernized = 17%
- Explanation what we would like to improve:

The course delivers a) second part of basic knowledge on geodesy and terrestrial surveying methods with sufficient time foreseen for practical exercise so that beside theory students can gain necessary skills in using terrestrial geodetic instrument and b) basic knowledge on topographic database, their maintenance and update representing final result of geodetic surveys. Respective knowledge and skills should be adjusted to newest developments in instrumental technique, resulting also in modernization of skills necessary to use those instruments and implement the methods (digital technology transformed also geodetic instruments).

Usage of mechanical optical and digital electro-optical instruments will provide students insight into difference between classical and modern instruments and effects on methods and results which can be achieved.

Note:

For this part as well as representation of individual measurement exercise previous knowledge in GIS is necessary and should be gained in other courses which precede this course. Resulting in inclusion of competence: Be able to perform spatial analysis using Geographic Information Systems (GIS).

V. Student workload (hours)	
Lecturing	52
Seminars	5.5
Project	10
Laboratory work/	12.5
Practical work, problem-solving, case studies, etc.	0
Total student workload	80



VI. Methodology and academic program		
Туре	Period	Content
Theoretical Classes	Week 1 to Week 10	Lectures, exposition and resolution of research works
Seminars/ Laboratory work	Week 1 to Week 12	Seminars, Practice cases, research discussions/ Laboratory work.
Practical work/ Exam	Week 13/ Week 14	Practical work and exam

Student participation in learning

The learning process provided in the curriculum of the course includes lectures, seminars/exercises, laboratory works, consultations, assignments/course project, and teaching practice.

Attendance in the different forms of learning is determined in accordance with the regulation of UPT for the development of curricula and teaching, according to article 29:

- attending lectures is mandatory, no less than 75% of the number of sessions held.
- attendance at seminars and exercises is mandatory, no less than 75% of the number of sessions held.
- attendance at laboratory works, and practical works is completely mandatory to the extent of 100%.

When the student, with or without reason, does not participate in more than 25% of the number of sessions held in a course, he is declared unclassified and is not allowed to pay off the further obligations of that course. He is obliged to follow the forms of learning again in the following year, with the same attendance duty.

VII. Assessment methods

Assessment of student's knowledge on the base of the learning outcomes, skills and competences are to be in accordance with the Albanian 10-grade rating system (from 1 to 10, where 10 is the maximum rating and marks from 5 and above are passing) defined by Education Regulation of Polytechnic University of Tirana:

Local Mark	Points	Grade	Definition		
10 Excellent	91 ÷ 100	А	outstanding performance with only minor errors		
9 Very good	84 ÷ 90	В	above the average standard but with some errors		
8 Good	75 ÷ 83	С	generally sound work with a number of notable errors		
7 Satisfactory	65 ÷ 74	D	fair but with significant shortcomings		
6 Adequate	55.04	r			
performances	55 - 04	E			
5 Acceptable	45 ÷ 54	FA	performance meets the minimum criteria (Passed exam)		
4 Insufficient	< 45	FX	Fail - further work required		
VII.1 Description of the t	ests for assessme	nt and their w	eights		
The knowledges control	and assessment sy	stem include	defenses of laboratory work, defenses of assignments and/or course projects,		
defenses of teaching prac	ctices, and midtern	n exams.			
A final exam that will be	taking place at th	ne end of the	semester. The exam will be a 70% final grade, the rest 30% comes from the		
evaluation of 100% participation in lectures (10%), from 100% participation in seminars and laboratories (10%), and from evaluating the					
results of practical and laboratory work (10%). The exam will take place with physical presence in the classroom, except for specific cases					
that do not allow it, such as Covid-19, etc., the exam will be online.					
Students have the right to appeal for the evaluation of the test.					
Curricular adaptations for students with a disability or special educational needs will be determined in accordance with the regulations in					
force of the UPT and the Ministry of Education.					
VII.2 Academic behavior, academic integrity, and honesty					
Polytechnic University of	Tirana (UPT) is full	y committed t	o the highest standards of academic integrity and honesty. Commitment to UPT		
means that you accept	the values of aca	demic integrit	y and honesty described in the University's Code of Ethics. To monitor this		
procedure, UPT has Regu	ulations on acader	nic behavior a	nd uses different various tools (anti-plagiarism, supervision) which provides a		
collective assurance that	these core values	are fully devel	oped.		
VII. Bibliography					
1. Ethem Bejko, Lectur	res, Classical Surve	y Methods, 20)14.		
2. Lectures, Advanced	Digital Stationary	Total Survey N	1ethods, GNSS Image Scanners and Systems, 2018.		
IX.Lecturers/Teachers/Pi	rofessors				
Lecturer/teacher/profes	sor's name		Dr. Sc. Ethem Bejko PhD		
E-mail address			bejko_ethem@hotmail.com,		
			atham haika@fin adu al		

Area Link

3.6.5 Topographic surveys and State Geodetic networks 2

Course & Subject identification: Topographic Surveying and State Geodetic Networks 2			
Type Compulsory			
Teaching period	Year 2, 2 nd semester		
	Credits: 7.5		
ECTS credits	Number of classroom teaching hours: 100.0		

Geodesy



	Lecturing: 4	
	Practice/exercise/Seminars: 0.5	
	Project: 1	
	Laboratory work: 1	
	Practical Training: 1	
Language	Albanian	
II. Presentation		
The course serves to familiarize and acquaint students with the	e basic theoretical concepts and knowledge of Geodesy related to the	
processes of surveying in geodesy. The course "Geodesy Network	s is intended to give and acquaint students with: Argumentation of the	
main parameters of the geodesic networks regarding the method	ls of their construction, design and evaluation.	
Provide knowledge of the impact of errors, accurate field measur	ement methods, their processing and evaluation. etc.	
III. Competences		
Generic competences		
1. Be able to communicate effectively and present professiona	al work in oral and written form.	
2. Be able to work in groups and manage professional (simple)	projects.	
3. Be aware of some legal, ethic, economic and environmental	l issues relevant to geodetic profession.	
 Be able to apply existing modern technology to solve complete 	ex professional projects.	
Specific competences		
Knowledge and understanding		
Mathematical and physical foundations of geodetic network Practical skills	ks, their establishment, computation and evaluation.	
1 Be able to design various types of geodetic networks and de	sfine measurement methods necessary for their establishment	
 Be able to process collected measurement data and adjust t 	the network	
3. Be able to interpret and visualize results (networks) and its	parameters.	
4. Be able to perform spatial analysis using Geographic Inform	ation Systems (GIS).	
Intellectual skills		
1. Be able to choose proper methods for data acquisition and	analysis.	
2. Be able to evaluate possibilities and limitations of existing to	echnologies for specific application areas.	
3. Be able to identify the needs of new methods and technolo	gies for existing and future problems.	
IV. Contents		
VI.A. Syllabus		
Week 1: Introduction to Geodetic reference systems and Geodetic	c reference frames. Division of	
Week 2: Global European and Albanian (old and new) Geodetic r	eference systems and frames	
Week 3: Transformation of Cartesian 2D coordinates and transfor	rmation regarding temporal	
changes.		
Week 4: State geodetic networks, methods and schemes of their	design and construction.	
Week 5: State Geodetic Network of Albania. Stages of its establis	hment.	
Week 6: Influence of errors on state geodetic networks.		
Week 7: Preliminary evaluation of geodetic networks.		
Week 8: Constrains and stages of establishment of the modern st	ate geodetic network.	
Week 9: Density and accuracy of geodetic network points. Design	ing Laplace bases and points.	
Week 10: Fixing geodetic network points. Construction of geodet	ic signals.	
Week 11: Design of state geodetic networks.		
week 12: Features of local geodetic networks.		
Modernization:		
- Lecture in Week 4 – modernized 50%		
- Lecture in Week 8 – completely		
 Percentage of course modernization = 12,5% 		
Explanation what we would like to improve:		
This course is fully focused on geodetic networks, their types, des	sign, constraints, establishment, computation and interpretation.	
Students should gain sufficient knowledge and skills to be able to perform all operation in design and establishment of state geodetic		
network and have capacity to interpret results of network computation (adjustement).		
Note:		
Singht difference in usage of English language is present - construct	ung vs establishing state geodetic networks ks must be lectured to students	
Logic imposes that before establishing (constructing) state goode	tic networks we design it! Therefore Lecture 11 should come forward	
before Lecture 8. However, there might be also different underst	anding of used English words meaning	
Service Lecture of nowever, there might be also unterent underst	anang or used English words meaning.	
V. Student workload (hours)		
Lecturing	52	
Seminars	5.5	
Project	20	
Laboratory work/	5	
Practical work, problem-solving, case studies, etc.	5	



Total student workload	87.5

Student participation in learning

The learning process provided in the curriculum of the course includes lectures, seminars/exercises, laboratory works, consultations, assignments/course project, and teaching practice.

Attendance in the different forms of learning is determined in accordance with the regulation of UPT for the development of curricula and teaching, according to article 29:

- attending lectures is mandatory, no less than 75% of the number of sessions held.
- attendance at seminars and exercises is mandatory, no less than 75% of the number of sessions held.
- attendance at laboratory works, and practical works is completely mandatory to the extent of 100%.

When the student, with or without reason, does not participate in more than 25% of the number of sessions held in a course, he is declared unclassified and is not allowed to pay off the further obligations of that course. He is obliged to follow the forms of learning again in the following year, with the same attendance duty.

VI. Methodology and academic program			
Туре	Period	Content	
Theoretical Classes	Week 1 to Week 10	Lectures, exposition and resolution of research	
	Week 1 to week 10	works	
Seminars/	Week 1 to Week 12	Seminars, Practice cases, research discussions/	
Laboratory work	Week I to week 12	Laboratory work.	
Practical work/	Week 13/	Dractical work and even	
Exam	Week 14		

VII. Assessment methods

Assessment of student's knowledge on the base of the learning outcomes, skills and competences are to be in accordance with the Albanian 10-grade rating system (from 1 to 10, where 10 is the maximum rating and marks from 5 and above are passing) defined by Education Regulation of Polytechnic University of Tirana:

Local Mark	Points	Grade	Definition
10 Excellent	91 ÷ 100	А	outstanding performance with only minor errors
9 Very good	84 ÷ 90	В	above the average standard but with some errors
8 Good	75 ÷ 83	С	generally sound work with a number of notable errors
7 Satisfactory	65 ÷ 74	D	fair but with significant shortcomings
6 Adequate	55 ÷ 64	F	performance meets the minimum criteria
performances	55 + 04	L	
5 Acceptable	45 ÷ 54	FA	performance meets the minimum criteria (Passed exam)
4 Insufficient	< 45	FX	Fail - further work required
VII.1 Description of the te	ests for assessme	nt and their w	eights
The knowledges control a	and assessment s	stem include	defenses of laboratory work, defenses of assignments and/or course projects,
defenses of teaching prac	ctices, and midter	n exams.	
A final exam that will be	taking place at t	he end of the	semester. The exam will be a 70% final grade, the rest 30% comes from the
evaluation of 100% partic	cipation in lecture	s (10%), from 1	LOO% participation in seminars and laboratories (10%), and from evaluating the
results of practical and la	boratory work (10	%). The exam	will take place with physical presence in the classroom, except for specific cases
that do not allow it, such as Covid-19, etc., the exam will be online.			
Students have the right to appeal for the evaluation of the test.			
Curricular adaptations for students with a disability or special educational needs will be determined in accordance with the regulations in			
force of the UPT and the Ministry of Education.			
VII.2 Academic behavior,	, academic integri	ty, and honest	у
Polytechnic University of	Tirana (UPT) is ful	y committed t	o the highest standards of academic integrity and honesty. Commitment to UPT
means that you accept the values of academic integrity and honesty described in the University's Code of Ethics. To monitor this			
procedure, UPT has Regulations on academic behavior and uses different various tools (anti-plagiarism, supervision) which provides a			
collective assurance that	these core values	are fully devel	oped.
VII. Bibliography			
1. Ethem Bejko, Syllab	us Lectures, State	and Local Geo	detic Networks, 2014.
2. Lectures, Advanced	Digital Stationary	Total Survey N	Aethods, GNSS Image Scanners and Systems, 2018.
IX.Lecturers/Teachers/Pr	rofessors		
Lecturer/teacher/profess	sor´s name		Dr. Sc. Ethem Bejko PhD
E-mail address			bejko_ethem@hotmail.com,
			ethem.bejko@fin.edu.al
Area			Geodesy
Link			

3.7 Polis University

Polis University Modernization Proposal includes 4 courses (Table 15):



Table 15 - Proposal of courses to modernize Polis University

No/Partner	Cour	se name (ECTS)	Level of study	% of the modernized courses compared to content included in the course	Number of students to be accepted in the first year	Category	EU & associated partners involved in providing support to modernize WB HEIIs courses
	01.	Geographic Informational systems (6)	Master	< 20%	30	Geodesy and analysis	UNIZG
	02.	Local Governance (6)	Master	< 20%	30	Governance and planning policies	URJC
	03.	Urban Economics (3)	Master	< 20%	30	Governance and planning policies	URJC
13/U_POLIS	04.	Urban planning (6)	Master	< 20%	30	Spatial and urban planning	воки

3.7.1 Geographic Informational Systems

Course &	Subject identification		
Туре		Mandatory	
Teaching	period	GIS ADVANCED – 2 nd semester	
ECTS crea	dits	6	
Language	2	English	
II. Presen	Itation		
The "Adv	anced GIS" module offers a thorough study of Geogra	aphical Information Systems (GIS) and their intricate relationships	with a
variety of	f scientific fields, such as risk management, urban planr	ning, territorial analysis, and geosciences. Through lectures, exercis	es, and
seminars	/discussions, this course provides students with a varie	ed learning experience that gives them a comprehensive understar	nding of
GIS and it	ts applications.		
Students	will travel through the complete lifecycle of a GIS pro	oject in this course, from its conception to its successful completion	on. The
program	covers a range of crucial topics, such as data integr	ation, analysis, and treatment, to make sure that participants b	ecome
proficient	t in managing GIS projects.		
GIS plays	a crucial role in facilitating the complicated processes of	of urban planning and analysis and will broadens its perspectives by	adding
multidim	ensional techniques. The ability to use GIS tools for u	urban modelling and analysis will help students become knowled	lgeable
decision-	makers in the field of urban planning and developmen	it. A station of the second sec	
The use of	of Python programming for automation is a key aspec	t of this course. This course acknowledges that Python has cemer	ited its
position	as the industry standard language for GIS experts. Par	streamling repetitious energing and increase the effectiveness	
initiativo	s Throughout the course tenics such as database may	screamine repetitious operations and increase the effectiveness	will bo
initiatives. Inroughout the course, topics such as database management, geographical data handling, mapping, and visualization will be thoroughly covered.			
This course's information is organized to be accessible to both povices and those looking for advanced expertise. It establishes a solid			
basis in G	ils foundations and gradually dives into advanced conc	cents to make sure that everyone may benefit from the course, reg	ardless
of past expertise. This course offers a holistic education that prepares individuals to tackle complex spatial challenges across various			various
scientific disciplines and professional domains.			
III. Comp	etences		
Generic o	competences		
1.	In essence, the "Advanced GIS" course aligns its a	aims to ensure that students are well-prepared to excel in the	field of
	international territory management and information systems by providing them with both academic understanding and		
	practical skill in GIS.		
2.	2. The course's first goal is to provide a strong foundation by teaching students the core ideas behind information systems for		
	managing global territories. This includes comprehending the relationships between GIS and many scientific fields, including		
	risk management, urban planning, and the geoscie	ences. The fundamental ideas that guide the use of GIS techno	ology in
	managing and analyzing geographical data on a worldwide scale will become clearer to the students.		
Specific competences			
1.	The goals of the "Advanced GIS" course are designed	d to give students a thorough and hands-on education in geograph	nic
	information systems (GIS) while covering important	ideas connected to information systems for international territory	1
management. Student should be able to understand the organization and operation of local government			
	Bodies.		
2.	Second, the training emphasises the growth of prac	tical knowledge and technical abilities. Hands-on instruction in us	ing GIS
	methodology and software tools will be provided to	participants. They will gain knowledge on how to use GIS systems,	handle
	geographic data, integrate data, execute in-depth a	analysis, and produce compelling visualizations. The course also t	eaches
1	students Python programming for automation, a cru	icial skill for increasing the effectiveness of GIS applications.	



IV. Contents VI.A. Syllabus

Chapter 1. INTRODUCTION

- 1) Introduction to the audience. Presentation of Lecturer and of the course.
- 2) Communication with the audience for the assessment of students' background knowledge on Geographical Information Systems, and expectations.

Chapter 2. **DEFINITION OF GIS**

- 1) Definition of Geographical Information Systems (GIS)
- 2) How does GIS work?
- a) GIS ecosystem and GIS components
- b) Graphic semiology for digital mapping
- c) Software
- i. ArcGis, QuantumGIS
- ii. Homemade GIS in industry
- 3) Exercises of visualization in a GIS software
- → Importing data
- ightarrow Changing visualization attributes

PART 2: CONCEPTUAL MODELING FOR GIS - 1 days and 3 hours

- 1) Data structure methodology
- 2) clustering information
- 3) Case studies
- a) Urban equipment
- 4) Individual module GIS project instructions

PART 3: HISTORY OF GIS and digital mapping

- evolution impacts on the key nowadays issues 1 days and 3 hours
- 1) Mapping and identity seeking (3rd century B.C)
- 2) Territorial governance and territorial management (2nd century, 16th and 18th centuries)
- 3) Technological revolution: digitalization (20th century)
- 4) A methodology to lead nowadays GIS Projects

PART 4: GEOGRAPHIC DIMENSION OF GIS

1) Geodetic reference systems and cartographic projections – 1 day

- a. Localization on Earth ellipsoid, and geographic polar coordinates, geodetic systems (WGS 84 ...)
- b. What is a cartographic projection and why are there many types of projections
- according to geographic areas and according to geographical policies?

c. Positioning tools: thanks to satellites (GPS and other satellite constellations) or thanks to instruments (signal receivers and mapping instruments)

GEOGRAPHY AND GEOMETRY – 4 hours

a) Geographic data acquired either thanks to images both thanks to numeric acquisitions: the difference between Raster and Vector data.

- b) Explanations about Vector type of data: vertexes, lines, poly-lines, surfaces, volumes and their visualization in a GIS.
- c) Explanations about Raster types of data
- d) GIS geometric measures and spatial analysis

EXERCISES - lab 1 day and 3 hours

- → Exercises of visualization of Vector and Raster data in a GIS
- → Imports and exports, scale considerations
- → Layers definition and utility, data for classification and data for identification
- → Coordinates conversions and coordinates coherency verification
- → What is digitalization?

→ Relations between geo-features in a GIS (Neighborhood, orientation) used for urban

- networks visualization or simulations for example
- ightarrow Analysis of the different elements created or imported to describe a single geofeature

(Transition to the next part - information systems)

Lesson Assignment/ Key words: Integrate knowledge on the geographical aspect of SIG (localization methodologies, geometry of data)/Understand databases underlying a GIS/Develop skills to use and adapt to the major desktop GIS and mapping technologies/Learn to design a database conceptual model related to a territorial subject/Understand the stakes of using GIS technologies for urban planning.

Student evaluation will be done by: 1) Theoretical knowledge assessment 2) Practical knowledge assessment 3) Attendance of classes

Practice /Laboratory/simulation.

The "Advanced GIS" class in the 2021–2022 academic year completed a complex assignment with a measurement of the Urban Health Index (UHI) in Tirana, Albania. Each student was entrusted with gathering information from various sources in a particular section of the



city. The evaluation adhered to the UHI's thorough framework, which has five major criteria: health, environment, geography, economy, and sociodemographic.

The UHI for each location was carefully computed and quantified by the students, who then presented their findings using data tables and visualizations. Through highlighting neighborhoods with both lower and higher UHI indices, this exercise helped people in Tirana get a more nuanced perspective of urban health disparities.

Students continued tackling important regional concerns in addition to the UHI analysis. They contributed to disaster preparedness by conducting a 10-year flood risk assessment for municipalities in northern Albania. Additionally, they created modular real estate pricing maps for each of three city development scenarios, providing important insights into where viable urban development could take place. This adaptive strategy makes sure that each year's assignment is customized to fit the class's changing demands and development.

IV.B. Training activities				
Туре	Description			
Reading		Reading of reports	& Academic Articles/XXXX	
Practical / Problem solving		Real-case analysis	(Case-Study) and problem solving	
		- Case study on GIS applications in Albania		
Other		Seminars from GIS	experts/XXX	
V. Student workload (hours)				
Participation in class activities and atter	idance	10 %		
Individual work		50 %		
Presentation and class discussion		30 %		
Graphic components and map quality		10 %		
Total student workload		100%		
VI. Methodology and academic				
program				
Туре	Period		Content	
Theoretical knowledge assessment			Lectures, exposition and resolution of research works	
Practical knowledge assessment			Practice resolution, cases, research	
			discussions/laboratory/simulations	
Attendance of classes			Seminars and exam	

VII. Assessment methods

VII.A. Assessment weighting Continuous ordinary assessment:

The "Advanced GIS" course methodology combines lectures with one-on-one and group activities as well as practical computer use to provide students with a dynamic and engaging learning experience.

Key ideas and theories are conveyed in lectures, which act as the basis of knowledge. Presentations and notes on the blackboard are used to supplement these lectures, giving students a wide range of tools to use as they progress through their education. Students have the chance to apply the theoretical knowledge they learned in lectures to situations in real life through individual and

group exercises. These tasks promote analytical thinking and problem-solving abilities. Students immediately interact with GIS software and tools as part of the computer practice component, which gives them the opportunity to gain technical expertise.

The overall goal of this course methodology is to provide students with a comprehensive grasp of GIS and its various applications in urban planning, territorial analysis, and other fields. This is accomplished by fostering a holistic learning experience that integrates theory and practical application.

Extraordinary assessment: Students who do not manage to pass the ordinary assessment, or who did not attend, will be subject to completion of an extraordinary assessment to verify their acquisition of the skills established in the guide, only for activities that are reassessable.

Description of the tests for assessment and their weights

The assessment framework for the "Advanced GIS" course in 2021–2022 is created to comprehensively evaluate students' comprehension and application of GIS principles. 10% of the grade is based on participation in class activities and attendance. Individual work makes up the majority of the evaluation (50%) and represents the students' capacity for data collection and analysis on the given topic. 30% goes towards the delivery of the presentation and class discussion, which supports efficient dissemination of the results. The remaining 10% is evaluated based on graphic components and map quality, highlighting the significance of transparent and visually appealing representations in GIS applications. This balanced evaluation strategy guarantees a thorough examination of students' knowledge and abilities.

VII.B. Assessment of students with an academic exemption

Student who wishes to opt for this assessment will have to get an academic exemption for the subject, which they will have to request from the Dean or Director of the Centre which teaches their course. An academic exemption may be granted where the subjects own characteristics allow for it.

Subject with the possibility of an exemption: Yes

VII.C. Review of assessment

In accordance with the exam appeal regulations of the POLIS University

VII.D.-Students with a disability or special educational needs

Curricular adaptations for students with a disability or special educational needs will be determined by the Disabled Students Support Department, in accordance with the regulations governing the Disabled Students Support service, approved by the POLIS University to guarantee equal opportunities, inclusive treatment, universal accessibility and a greater guarantee of academic success. For this purpose, this Department will have to issue a curricular adaptation report, therefore students with disabilities or special

educational needs must contact the Department to analyze the different alternatives together.

VII.E.-Academic behavior, academic integrity, and honesty



POLIS University is completely committed to the highest standards of academic integrity and honesty. Therefore, studying at POLIS University means you accept and agree to the academic integrity and honesty values described in the University's Code of Ethics. To monitor this procedure, the University has Regulations on academic behavior at POLIS University and uses different tools (antiplagiarism, supervision) which provides a collective assurance that these essential values are completely developed

VII. Bibliography		
Generic References		
 Constitution of the Republic of Albania 		
Bruno Dente (2014) Understanding Decision Making.		
Specific References		
Law 8652 dated 31.07.2000 "On the organization and o	peration of Local Government"	
The electronic library of ESRI, which has a wide range of li	iterature in function of using ArcGIS	
Dispense_Local Government. 2020		
Ministry of the Interior, decentralization and local govern	ment strategy	
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Vng., local government in the Netherlands		
Bajram Polozhani, Ermir Dobjani, Esat Stavle	ci, Lazim Salihu, Administrative Law Comparative Aspects,	
Skopje 2010		
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Moreno, A.M., "Local Government in the member states	of the European Union: A comparative legal perspective", National Institute	
of Public Administration, Madrid 2012		
Council of European Municipalities, "Local and Regional Government in Europe: Structures and Competences",		
https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwipjp_LjpqAAxW7dqQEH		
Yz6AelQFnoECCUQAQ&url=https%3A%2F%2Fwww.ccre.org%2Fdocs%2FLocal and Regional Government in Europe.EN.pdf&us		
<u>q=AOvVaw0_jUhycRKTrwxdHqRWqD97&opi=89978449</u>		
European Commission, "Handbook of Territorial and Local Development Strategies",		
https://ec.europa.eu/regional_policy/whats-new/panorama/2023/03/22-03-2023-handbook-of-territorial-and-local-		
development-strategies_en_		
IX.Lecturers/Teachers/Professors		
Lecturer/teacher/professor's name	Dr. Kristaq Qirko, Dr. Amanda Terpo, Lab. Leonora Haxhiu	
E-mail address	kristaq_qirko@universitetipolis.edu.al	
	amanda terpo@universitetipolis.edu.al	
	leonora_haxhiu@universitetipolis.edu.al	
Area	Urban planning policies	

3.7.2 Local Governance

Course & Subject identification: LOCAL GOVERNANCE			
Туре	Mandatory		
Teaching period	Local Governance – 2 nd semester		
ECTS credits	6		
Language	English		
II. Presentation			
The main objective of the course is to provide expanded knowle	edge on local government. To provide a broad framework of legal and		
administrative knowledge for local government. To offer knowledge	edge about the Government. What is it and how do we distinguish it? To		
offer knowledge on decision-making models and economic cons	sequences. To provide sufficient knowledge to understand the problems,		
successes, different models and trends of local governance in a	comparative way from decision-making models. The student is aimed to		
acquire sufficient and necessary knowledge of the main functio	ning mechanisms of the local government units as well as a mind-set of		
a legal culture necessary for his future.			
III. Competences			
Generic competences			
01. Ability to understand a broad framework of legal and	administrative knowledge for local government.		
02. Ability to understand the problems, successes, different models and trends of local governance in a comparative way from			
decision-making models.			
Specific competences			
01. Student should be able to understand the legal fram	ework of local government		
02. Students should be able to understand Inter-institutional relations and control in local government			
03. Student should be able to understand the organization and operation of local government bodies			
IV. Contents			
VI.A. Syllabus			
Chapter 1. History of local government in Albania			
Chapter 2. Legal framework of local government. Principles of	operation and organization of local government.		
Chapter 3. Principles of Good Governance.			

Chapter 4. Organization and operation of local government bodies



Chapter 5. Decision Making Models			
Chapter 6. Actresses			
Chapter 7. Sources of actresses			
Chapter 8. To build the "Institutional Arena" table			
Chapter 9. Functions and Powers of Local Government.			
Chapter 10. Division of functions and powers of local government			
Chapter 11. Local Government Finances			
Chapter 12. Inter-institutional relations and control in local govern	ment.		
Chapter 13. Human resource management.			
Chapter 14. Organizations of local elected officials			
Chapter 15. Local Government in the member states of the Europea	n Union: Structure & Trends		
Practice /Laboratory/simulation.			
Case study on local government in Albania. Students will be divided	into 5 groups. Each group will study a sectoral agenda/law: 1) Law		
on Waste Management, 2) Management of Protected areas, 3) Law	on Territorial Planning, 4) Law on Transport, 5) Law on Cultural		
Heritage.			
The students will be asked to build the "Institutional Arena" with ep	istemological output and outcome questions. This is to compare the		
level of centralization of power, the competencies of actors in 5 sectors actors in 5 sectors actors in 5 sectors actors and a sector sectors actors	ors and their roles.		
Linion city which local Government in the European Union. Students w	III be divided into 5 groups. Each group will choose a European		
Each group will analyze city's most relevant initiatives and will prese	is and appealing interns of Local Governance and Sustainability.		
minutes presentation. The presentation would include a Workshon a	activity that should finish with a SWOT Analysis contrasting and		
comparing ELL initiatives with those from Albanian cities & municipalities. The Case study should get focused on an important or			
relevant aspect of the city chosen. For example, Valencia (Spain) could be analyzed as a benchmark as a European Capital and Green			
Pioneer of Smart Tourism.			
See information in the following link:			
https://smart-tourism-capital.ec.europa.eu/valencia-european-capital-smart-tourism-2022_en			
European Union usually provides information about these initiatives	and the students could get focused on a particular aspect that		
interest the most to them:			
https://smart-tourism-capital.ec.europa.eu/leading-examples-smart-tourism-practices-europe_en			
Keywords:			
History of Local Government in Albania/ Legal framework of local government/ Principles of operation and organization of local			
government/ Organization and operation of local government bodies/ Functions and powers of local government/ Division of functions			
and powers of local government/ Finances of local government / Ir	ter-institutional relations and control in local government/ Albania		
towards regionalization/ Local elected organizations			
IV.B. Training activities			
Туре	Description		
Reading	Reading of reports & Academic Articles/XXXX		
Practical / Problem solving	Real-case analysis (Case-Study) and problem solving		

Tractical / Troblem Solving	Real-case analysis (case-study) and problem solving		
	 Case study on Local Government in Albania 		
	 Case study on Local Government in EU 		
	 Workshop & SWOT Analysis 		
Other	Seminars from industry experts/XXX		

V. Student workload (hours)					
Attendance		10 %			
Participation in discussions		10 %			
Project		50 %			
Presentation		30 %			
Total student workload		100%	100%		
VI. Methodology and academic					
program					
Туре	Period		Content		
Theoretical Classes	Week 1 to Week 12		Lectures, exposition and resolution of research works		
Practical Classes	Week 13 to Week 25		Practice resolution, cases, research		
			discussions/laboratory/simulations		
Seminars & exam	Week 26 to Week 30		Seminars and exam		
VII. Assessment methods					

VII.A. Assessment weighting

Continuous ordinary assessment:

The distribution and characteristics of the assessment tests are those described below. Only in exceptional case and for special reasons may the teacher add changes to the Guide. These changes will require the prior consultation with the Course Head and the prior and explicit authorization of the Degree Program Coordinator, who will notify the Vice-Rector's office in charge of Academic Affairs of the modifications made. In any case, the changes proposed must consider the stipulations of the verified report. For these changes to take effect, they must be duly communicated at the start of the course to the students using Aula Virtual.

The combination of activities that are not re-assessable cannot exceed 70% of the course grade and, in general, cannot have a minimum grade (except for the case of laboratory or clinical work placements, where duly justified), and tests which exceed 30% of the course weighting cannot be added. Extraordinary assessment: Students who do not manage to pass the ordinary assessment, or who did not attend, will be subject to completion of an extraordinary assessment to verify their acquisition of the skills established in the guide, only for activities that are reassessable Description of the tests for assessment and their weights A final exam that will be taking place at the end of the seminar. The project will be a 40% of final grade, 10% comes from the participation in discussions, 30% project presentation and 10% comes from attendance. The exam will take place in physical class. Only if the situation at the moment does not allow it, the exam will be online. VII.B. Assessment of students with an academic exemption Student who wishes to opt for this assessment will have to get an academic exemption for the course, which they will have to request from the Dean or Director of the Centre which teaches their course. An academic exemption may be granted where the courses own characteristics allow for it. Course with the possibility of an exemption: Yes VII.C. Review of assessment In accordance with the exam appeal regulations of the POLIS University VII.D.-Students with a disability or special educational needs Curricular adaptations for students with a disability or special educational needs will be determined by the Disabled Students Support Department, in accordance with the regulations governing the Disabled Students Support service, approved by the POLIS University to guarantee equal opportunities, inclusive treatment, universal accessibility and a greater guarantee of academic success. For this purpose, this Department will have to issue a curricular adaptation report, therefore students with disabilities or special educational needs must contact the Department to analyze the different alternatives together. VII.E.-Academic behavior, academic integrity, and honesty POLIS University is completely committed to the highest standards of academic integrity and honesty. Therefore, studying at POLIS University means you accept and agree to the academic integrity and honesty values described in the University's Code of Ethics. To monitor this procedure, the University has Regulations on academic behavior at POLIS University and uses different tools (antiplagiarism, supervision) which provides a collective assurance that these essential values are completely developed VII. Bibliography **Generic References** •Constitution of the Republic of Albania Bruno Dente (2014) Understanding Decision Making. **Specific References** Law 8652 dated 31.07.2000 "On the organization and operation of Local Government" The electronic library of ESRI, which has a wide range of literature in function of using ArcGIS Dispense Local Government. 2020 Ministry of the Interior, decentralization and local government strategy Local government in Albania, publication of the association of municipalities, Afrojd, 2010; Vng., local government in the Netherlands Bajram Polozhani, Ermir Dobjani, Stavleci, Esat Lazim Salihu. Administrative Law Comparative Aspects. Skopje 2010 Sadushi.S., "Administrative law 2", Tirana 2005 Dobjani E., "Administrative law 1", Shblu, Tirana 2007 Moreno, A.M., "Local Government in the member states of the European Union: A comparative legal perspective", National Institute of Public Administration, Madrid 2012 Council of European Municipalities, "Local and Regional Government in Europe: Structures and Competences", https://www.google.com/url?sa=t&rct=j&g=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwipjp_LjpgAAxW7dqQEH Yz6AelQFnoECCUQAQ&url=https%3A%2F%2Fwww.ccre.org%2Fdocs%2FLocal and Regional Government in Europe.EN.pdf&us g=AOvVaw0 jUhycRKTrwxdHqRWqD97&opi=89978449 European Commission, "Handbook of Territorial and Local Development Strategies", https://ec.europa.eu/regional_policy/whats-new/panorama/2023/03/22-03-2023-handbook-of-territorial-and-localdevelopment-strategies en IX.Lecturers/Teachers/Professors Lecturer/teacher/professor's name Dr. Artan Kacani, Agron Haxhimali E-mail address artan kacani@universitetipolis.edu.al agron haxhimali@universitetipolis.edu.al Urban planning policies Area

3.7.3 Urban Economics

Course & Subject identification: URBAN ECONOMICS			
Туре	Mandatory		
Teaching period	URBAN ECONOMICS COURSE, 1st semester		
ECTS credits	6		
Language	English		
II. Presentation			



Urban Economics studies the spatial behavior of the economic actors and how it impacts the regional / urban economic performance and competitiveness. As such, the course builds upon concepts of economics and planning already familiar to the students via preliminary courses such as Economics and Planning Systems.

The course also serves as a building basis for upcoming topics treated in courses such as Regional Planning.

III. Competences Generic competences

- 01. The course of "Urban Economics" intends to introduce the students to the market forces in local and regional economy, the main economic actors and their spatial behaviour. Upon the completion of the course the students will be able to understand how urban and regional development policies can affect this behaviour.
- 02. Ability to present one's own points of view and analyse.
- 03. Ability to verify and integrate the knowledge of the study field.
- 04. Students apply their acquired knowledge and problem-solving skills in new or unfamiliar environments within broader (or multidisciplinary) contexts related to the area of urban economics.

Specific competences

- 01. Know how to identify the needs and demands of the contexts in which the application of methodological tools is required and learn to propose appropriate solutions for the research questions that emanate from the lines derived from the scope.
- 02. Develop reasoning and critical thinking to perform analysis of the case study, description and diagnosis of current problems close to the environment in which the student is using the tools provided from the course, and that organizations use for their own diagnosis.
- 03. Propose appropriate solutions based on the urban economics studies.

IV. Contents

VI.A. Syllabus

Chapter 1. Introduction to Urban Economics Chapter 2. Market forces in city development 2.1. Comparative Advantage 2.2. Economies of scale Chapter 3. Location Theories 3.1. Transfer firms Chapter 4. Agglomeration Economies Chapter 5. Clusters Chapter 6. City Size Chapter 7. Localization Economies / Urbanization Economies Chapter 8. Urban growth Chapter 9. Rent 9.1. David Ricardo Theory 9.1. Neoclassical Rent Theory Chapter 10. Rent 10.1. Extensive Growth 10.1. Intensive Growth Chapter 11. Rent 11.1. Monocentric City 11.1. Urban Sprawl Chapter 12. Urban Economics in the European Union 12.1 The dimensions of Urban Life: Environmental, economic, social and cultural 12.2 Challenges of European Cities 12.3 The economic dimensions of Green and Digital Transitions 12.4 Urban Agenda for the EU: Priority Themes for cities Practice /Laboratory/simulation The assignment will consist in a 7-page essay (Times New Roman, 12, single space) of which no more than 2 pages of illustrations. (maps, graphics, etc.) The analysis needs to be based on desk and field research. The desk research should make reference to the theories covered class and the available data and resources; prior to the field research the students will design a questionnaire or set of questions for semi-structured interviews. Assignments that do not comply with citation standards and accurate academic references will not be accepted. Classes will be organized in the form of lectures and seminars trying to contextualize the treated concepts by bringing forth international and Albanian illustrations. Therefore, the seminars will consist in structured discussions between the lecturer and the students. During the seminars, exercises will be developed that enable the application of theoretical concepts in concrete situations. Additional Assignment Proposal: The students will be organized in groups. Each group will work in one of the Priority Themes defined in the Urban Agenda for the EU. There is a wide range of issues with an economic dimension and directly related to sustainability from circular economy and climate adaptation to urban mobility and sustainable use of land and nature-based solutions. Each group will give a presentation of the chosen priority themes explaining the situation in the EU and connecting it with the Albanian context. Finally a workshop will be organized where a SWOT Analysis will be presented based on the work developed by students. Keywords: Market forces in urban development / Comparative advantage / Competitive Advantage / Economies of scale / Location theories / Transfer firms / Resource oriented firms / Market oriented firms / Central location theory / Local inputs / Clusters / Labor supply / Compatibility between labor supply and demand / Utility / Utility and size of cities / Localization and urbanization economies / Specialized cities and diversified cities / Urban growth / Rent and Land Use / Rent Determination / David Ricardo Theory / Neoclassical Rent Theory / Principle of Residual Value / Substitution Effect / Urban Land Growth / Extensive Growth / Intensive Growth / Land Use /

Monocentric City / Urban Sprawl



IV.B. Training activities			
Туре		Description	
Reading		Reading of reports & Academic Articles	
Practical / Problem solving		Real-case analysis (Case-Study) and problem solving	
Other		Seminars from industry experts/XXX	
V. Student workload (hours)			
Lecture classes		40	
Practical classes/problem-solving, case studies, etc.		2	
Tests		5	
Related activities: conferences, seminars, etc.		10	
Total student workload		60	
VI. Methodology and academic program			
Туре	Period		Content
Theoretical Classes	Week 1 to Week 12		Lectures, exposition and resolution of research works
Practical Classes	Week 13 to Week 25		Practice resolution, cases, research discussions/laboratory/simulations
Seminars & exam	Week 26 to Week 30)	Seminars and exam

VII. Assessment methods

VII.A. Assessment weighting

Continuous ordinary assessment:

The distribution and characteristics of the assessment tests are those described below. Only in exceptional case and for special reasons may the teacher add changes to the Guide. These changes will require the prior consultation with the Course Head and the prior and explicit authorization of the Degree Program Coordinator, who will notify the Vice-Rector's office in charge of Academic Affairs of the modifications made. In any case, the changes proposed must consider the stipulations of the verified report. For these changes to take effect, they must be duly communicated at the start of the course to the students using Aula Virtual.

The combination of activities that are not re-assessable cannot exceed 80% of the course grade and, in general, cannot have a minimum grade (except for the case of laboratory or clinical work placements, where duly justified), and tests which exceed 30% of the course weighting cannot be added.

Extraordinary assessment: Students who do not manage to pass the ordinary assessment, or who did not attend, will be subject to completion of an extraordinary assessment to verify their acquisition of the skills established in the guide, only for activities that are re-assessable.

Description of the tests for assessment and their weights

A final exam that will be taking place at the end of the seminar. The exam will be a 30%% of final grade, 40% comes from the project, 20% comes from class work and 10% comes from attendance. The exam will take place in physical class. Only if the situation at the moment does not allow it, the exam will be online.

VII.B. Assessment of students with an academic exemption

Student who wishes to opt for this assessment will have to get an academic exemption for the course, which they will have to request from the Dean or Director of the Centre which teaches their course. An academic exemption may be granted where the courses own characteristics allow for it.

Course with the possibility of an exemption: Yes

VII.C. Review of assessment

In accordance with the exam appeal regulations of the POLIS University

VII.D.-Students with a disability or special educational needs

Curricular adaptations for students with a disability or special educational needs will be determined by the Disabled Students Support Department, in accordance with the regulations governing the Disabled Students Support service, approved by the POLIS University to guarantee equal opportunities, inclusive treatment, universal accessibility and a greater guarantee of academic success.

For this purpose, this Department will have to issue a curricular adaptation report, therefore students with disabilities or special educational needs must contact the Department to analyze the different alternatives together.

VII.E.-Academic behavior, academic integrity, and honesty

POLIS University is completely committed to the highest standards of academic integrity and honesty. Therefore, studying at POLIS University means you accept and agree to the academic integrity and honesty values described in the University's Code of Ethics. To monitor this procedure, the University has Regulations on academic behavior at POLIS University and uses different tools (antiplagiarism, supervision) which provides a collective assurance that these essential values are completely developed

VII. Bibliography

Generic References

O' Sullivan, A., 2009 "Urban Economics", 7th Edition, McGraw Hill, New York

Specific References

Nientied, P.; Karafili, E. (2016); "Towards a Pragmatic Perspective on Business Innovation in Western

Balkan Countries: The Case of Albania", International Journal of Business and Management, Canadian Center of Science and Education, DOI: http://dx.doi.org/10.5539/ijbm.v11n3p193

EU Sustainable Urban Development

https://ec.europa.eu/regional policy/policy/themes/urban-development en

Urban Agenda for the EU

 $\underline{https://commission.europa.eu/eu-regional-and-urban-development/topics/cities-and-urban-development/urban-agenda-eu_en$



McCann, P., 2015 "The Regional and Urban Policy of the European Union", 1st Edition, Edward Elgar Publishing, Cheltenham			
Colantonio, A.; Burdett, R.; Rode, P. 2013 "Transforming Urban Economies", Routledge, 1st edition, London.			
IX.Lecturers/Teachers/Professors			
Lecturer/teacher/professor's name	Dr. Elona Karafili		
E-mail address	Elona karafili@universitetipolis.edu.al		
Area	Urban Economy		

3.7.4 Urban Planning

Course & Subject identification				
Туре	Mandatory			
Teaching period	Urban Planning – 2 nd semester			
ECTS credits	9			
Language	English			
II. Presentation				
The discipline is included in the group of studio courses in general and those of urban planning and design specifically. This course integrates knowledge gained in the courses of architecture studios developed during the previous years and especially of the analysis of the territory and settlements. The course contains some key logical lines which combine issues of theoretical concentual and practical				
nature of design and urban planning based mainly on critical an	alysis of planning movements with a central focus on the American			
experience. The theoretical content aims to expose students to	the relationships that urban design has with city planning as a whole as			
well as the influence exercised by other disciplines such as scien	ce, philosophy, sociology, environment, arts, etc. All of these will be			
illustrated with case studies that will tell success or failure storie	es. The Albanian context and the positioning of the design and urban			
planning discipline in the current situation will be addressed thr	oughout the course. Thus the course aims to encourage students for an			
alternative exploration of the process of creating urban spaces a	and the factors involved in it.			
III. Competences				
Generic competences				
4. Ability to present one's own points of view and analy	/se.			
5. Ability to verify and integrate the knowledge of the s	tudy field.			
6. Students apply their acquired knowledge and proble	m-solving skills in new or unfamiliar environments within broader (or			
multidisciplinary) contexts related to the area of urba	an economics.			
Specific competences				
2. Know now to identify the needs and demands of the	contexts in which the application of methodological tools is required			
3 Develop reasoning and critical thinking to perform a	nalysis of the case study, description and diagnosis of current problems			
close to the environment in which the student is usir	by the tools provided from the course, and that organizations use for			
their own diagnosis.				
IV. Contents				
VI.A. Syllabus				
Chapter 1. Planning Movements in the USA, Tirana				
Chapter 2. Prefix "design"; forms and applications of applied d	esign and art; "Turbo-design" and "turbo-culture"; "Turbo-urbanism			
Chapter 3. Participatory and Inclusive Planning. Formalization.	Community and city level planning. Regional planning and national			
spatial policies.				
Chapter 4. Between Vacuum and Energy - Co-PLAN experience	es on urban planning in Albania			
Chapter 5. Engineering of livable cities; cleaning, hygiene and s	survival; water and wastewater systems; roads and bridges;			
engineering and planning;				
The theoretical concept of urban resilience – the ability of city d	wellers to withstand economic, social, health, environmental, disaster			
and climate related risks. It is an introduction to the topic of res	ilience supplemented in more detail in later stages of the course.			
1. Climate resilience				
2. Environmental resilience				
4. Economic resilience				
4. Economic resilience Chapter 6. Garden cities: Ebenezer Howard and the green citie	s of tomorrow: three magnets: garden cities in England LISA federal			
government and green belt cities: the influence of the garden	rity			
2. Environmental resilience – biodiversity, restoring damaged	ecosystems, adopting sustainable agricultural practices.			
Chapter 7. The "City beautiful" movement, civic art; world fairs	s; Washington DC and civic centers; Planet "city beautiful";			
Chapter 8. Practical planning: consultants and comprehensive planning: professional institutions				
Chapter 9 Regionalism 1910-1940. Idea metronolitan: metronolitan planets: regional opinion: regional planning and "New Deal".				
Chapter 10 Public housing and urban renewal: settlement of information settlements and noverty nublic housing; federal housing				
after World War II: Urban renovation: Urban renovation: criticism of urban renewal: measurements and modeling				
Chapter 11. Planning for equality and protection of rights; "Advocac planning"; housing and minimum standardized; housing for all;				
the city and large societies; the birth of community development; equity planning;				
3. Social resilience - Understanding the city from a human perspective, diversity in urban planning, social vulnerability, human health				
in urban planning				
Chapter 12. Urban growth and environmental concerns; Challenges of urban sprawl; suburbanization and environmental movement;				
to design with nature;				
1. Climate resilience – Climate change and consequences for urban planning, IPCC Risk concept in urban planning, nature based				
solutions, urban green and blue infrastructure.				
Chapter 13. Nationwide land use planning programs;				
Report on modernization of university courses in collaboration with industry sector



Chapter 14. Redesign of city centers; the social psychology of the country; heritage protection; the new era of city center planning; Chapter 14. Improved neighborhoods; new cities; new urbanism; neighborhood conservation; new neighborhoods 1960-1970; Chapter 15. New regionalism; environment, policy and planning; governance and metropolitan politics; metropolitan-scale environmental challenges; new regional plans; green line management;

4. Economic resilience – governance, critical urban infrastructure

Chapter 16. Environmental justice; principles of movement; issues for planners; environmental recovery efforts; standardized and orientation manuals;

Chapter 17. Stability and principles of movement; long-term orientation towards the future; constraints, nature and geography; instrument orientation; interdependence and the "holistic" / holistic view; participation;

Chapter 18. Healthy cities; communities; eleven characteristics of healthy cities; the contrast between healthy cities and the

movement of sustainable communities; The relationship of healthy cities with urban planning and design

Chapter 19. Current planning and design trends represented in innovative settlements.

Concept:

Urban planning: The American case, the European experiences, the Balkans, the Albanian case. Urban design. Environmental design. Landscape design

Practice n/Laboratory/simulation.

The objective of the course will be to provide students with a series of theoretical and practical instruments that enable reading and then intervention in a territorial or even urban context.

References will be numerous and comprehensive. The case study will be studied in America, Europe and Asia through numerous case studies. The focus of the study will be the Balkan region, which has been located for years at a point where the political, economic and social interests of the three aforementioned continents intersect. Situated in this neuralgic position, the Balkans reflect a mixture of different traditions and cultures. From this point of view, the study in the Balkan region is important precisely for the cultural and social pluralism that it presents.

Case studies where they will focus on areas of great national interest and that constitute strategic points for regional development at the national level and beyond. The main focus of this project is the development of these areas based on their economic, historical, environmental, food resources, etc.....

The organization of the task will be divided into three main phases:

1. Field visit to understand the situation of these areas, to highlight the weak points and to highlight its potentials. Data will be collected through research instruments appropriate to the course, businesses and tourists will be researched both internally and externally. These data will be stored in a clear graphic system and based on them will start the project which is intended as an integral result of the context and which arises at the same time as the first analysis.

Here, it would make sense to integrate the drones as data sources. The handling of the drone and the processing of the data must then be integrated into the lecture part.

2. The second phase is based on building a strategic vision on each case based on some of the main pillars of development such as agriculture, environment, nature, tradition, history, etc., where all these will have as their main objective the strengthening of the economy and well-being in these areas. Strategies should be represented at a schematic level, but in the final stage they are required to be drawn, affecting the spatial affiliation. Strategies and projects should be as concrete and realistic as possible for the context in which the intervention will take place, adapting to the specific conditions and environment.

3. The third phase will focus on detailing a certain area inside the settlement on the basis of the strategic projects listed in the second phase. The required objective is the drawing on a scale of 1: 2000 or even 1: 500 of a certain area where the infrastructure, parcelization, functional program and the respective volumetrics will be reflected.

PHASE 1.

The first phase of the field visit will take place at the beginning of the course where each group will visit the area individually and in special cases can be organized visits organized by the teaching staff. On the basis of this phase the first impressions on the areas will be drawn. All work will be organized in groups of 4-5 students led by the teaching staff. Each group will have the task of analyzing, drawing conclusions and proposing interventions based on the following analyzes:

1.a. Social analysis. (demographics, education, unemployment, gender distribution of unemployment in relation to education). Historical Analysis. (History of the Region, historical development of settlements). Cultural Analysis. (analysis of cultural strengths such as events, traditions, national or international specifics).

1.b. Infrastructure analysis. (rail transport, tire transport). Analysis of terrain morphology and settlements in relation to the terrain. Analysis of Services at regional level or of large specifications (industrial areas, agricultural areas, settlements, tourist areas)

1.c. Environmental analysis. (analysis of greenery divided into natural greenery, artificial greenery, agricultural land). Hydrographic analysis (rivers, natural or artificial lakes, streams, underground canals)

At the end of this phase, which as we mentioned lasts 10 days, it is expected as a result the presentation of the first impressions in the bandages and the proposal of preliminary ideas,

PHASE 2

In the second phase we will work on creating a strategic vision for the development of each village, focusing on the development of tourism and more specifically that of agritourism where the analysis will be:

2.a. Social analysis. (demographics, education, unemployment, gender distribution of unemployment in relation to education). Historical Analysis. (History of the city, historical development of settlements, historical stratification of city areas). Cultural Analysis. (analysis of cultural strengths such as events, traditions, city specifics).

2.b. Infrastructure analysis. (rail transport, tire transport, various fabrics). Analysis of the morphology of the city in relation to agglomerations in settlements. Analysis of Services at the city level (government, administrative, health, education, culture, special, commercial, economic, tourism, entertainment, etc.

IV.B. Training activities	
Туре	Description
Reading	Reading of reports & Academic Articles/XXXX
Practical / Problem solving	Real-case analysis (Case-Study) and problem solving/XXXX



Othor		Sominars from in	adustry avports /XXX				
V. Student workload (hours)		Seminars from industry experts/XXX					
Attendance		10 %					
Work / Mans / Broject		60 %					
Exam		30 %					
Total student workload		100%					
VI Methodology and academic program		100%					
Type	Period		Content				
Theoretical Classes	Week 1 to Week 12		Lectures exposition and resolution of research				
	WEEK I to WEEK IZ		works				
Practical Classes	Week 13 to Week 25		Practice resolution cases research				
			discussions/laboratory/simulations				
Seminars & exam	Week 26 to Week 30)	Seminars and exam				
VII. Assessment methods							
VII.A. Assessment weighting							
Continuous ordinary assessment:							
The distribution and characteristics of the ass	essment tests are thos	e described below	. Only in exceptional case and for special reasons				
may the teacher add changes to the Guide. The	nese changes will requi	re the prior consul	Itation with the Course Head and the prior and				
explicit authorization of the Degree Program	Coordinator, who will r	notify the Vice-Rec	tor's office in charge of Academic Affairs of the				
modifications made. In any case, the changes	proposed must consid	er the stipulations	of the verified report. For these changes to take				
effect, they must be duly communicated at th	e start of the course to	, the students usin	g Aula Virtual.				
The combination of activities that are not re-a	ssessable cannot exce	ed 70% of the cou	rse grade and, in general, cannot have a minimum				
grade (except for the case of laboratory or cli	nical work placements,	where duly justified	ed), and tests which exceed 30% of the course				
weighting cannot be added.							
Extraordinary assessment: Students who do	not manage to pass the	e ordinary assessm	ent, or who did not attend, will be subject to				
completion of an extraordinary assessment to	verify their acquisition	n of the skills estab	plished in the guide, only for activities that are re-				
assessable.							
Description of the tests for assessment and t	heir weights						
A final exam that will be taking place at the er	nd of the seminar. The	project will be a 60	0% of final grade, 30% comes from the exam, 30%				
project presentation and 10% comes from att	endance. The exam wi	ll take place in phy	vsical class. Only if the situation at the moment				
does not allow it, the exam will be online.							
VII.B. Assessment of students with an acade	nic exemption						
Student who wishes to opt for this assessmen	t will have to get an ac	ademic exemption	n for the course, which they will have to request				
from the Dean or Director of the Centre which	n teaches their course.	An academic exen	nption may be granted where the courses own				
characteristics allow for it.							
Course with the possibility of an exemption: Y	es						
VII.C. Review of assessment		-14					
In accordance with the exam appeal regulation	ns of the POLIS Univers	sity					
VII.DStudents with a disability of special ed	ucational needs		- delete in the back of the delete the term				
Curricular adaptations for students with a dis	ability or special education	tional needs will b	e determined by the Disabled Students Support				
Department, in accordance with the regulation	ins governing the Disad	ied Students Supp	for service, approved by the POLIS University to				
For this purpose, this Department will have to	inent, universal access	oblinity and a greate	er guarantee of academic success.				
educational needs must contact the Departm	ent to analyze the diffe	arent alternatives t	together				
VII E -Academic behavior academic integrity	and honesty	arent alternatives t	logether.				
POLIS University is completely committed to t	he highest standards o	of academic integri	ty and honesty. Therefore, studying at POUS				
University means you accept and agree to the	academic integrity and	d honesty values d	lescribed in the University's Code of Ethics. To				
monitor this procedure, the University has Re	gulations on academic	behavior at POLIS	University and uses different tools (anti-				
plagiarism, supervision) which provides a colle	ective assurance that the	hese essential valu	ies are completely developed				
VII. Bibliography							
Generic References							
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IX.Lecturers/Teachers/Professors					
Lecturer/teacher/professor's name Prof. Dr. Besnik Aliaj					
E-mail address <u>besnik aliaj@universitetipolis.edu.al</u>					
Area	Urban planning				

4. Summary on modernization of university courses in collaboration with the industry sector

The twenty-nine bachelor's and master's degree courses presented in the previous sections of this report have been modernized in a range that varies under 10% or under 20% of the original content of the courses. The aspects on which the modernization process have been focused on have been the following ones:

- Inclusion of new generic and specific competences which students will acquire after taking the modernized courses.
- Inclusion of new topics and expansion of the current ones in modernized courses' syllabus according to the demands of current teaching staff and national professionals of the field as well as with the support and advice of EU and Third Countries non-associated to the Programme Countries.
- Inclusion of new activities in the practical part of the modernized courses new practices, management of laboratory equipment and supporting instruments, application of new methodologies, technological advances, software, and information systems.
- Inclusion of new bibliographic references (generic and specific) for the courses.

The next sections present a summary of the scope and degree of modernization of all the courses organized by Western Balkan's Higher Education Institutions. The tables present in detail in parentheses the number of new elements in the course in comparison with the total elements that are part of the course (number of new elements/total number of elements in the modernized course). The goal number of courses to modernize, 29 has been completely achieved. This number of modernized courses is 9, clearly over the minimum planned in project, 20.

4.1 University of Montenegro (UoM)

The following table (Table 16) summarizes the modernization process of University of Montenegro's University Courses. Just two out of seven courses have updated the Generic and Specific Competences including new ones. It is relevant to mention that all the courses have included new topics (4 out of 7) or new or expanded sections in the original topics defined in the course (6 out of 7). Four courses have included new practices and activities oriented to modernized and dynamized the content of the course. Finally, five out of seven courses have incorporated new bibliographic references in English to align the references with the new and modernized content of the courses.

Table 16 - Summary of the modernization process for UoM's courses



No/Partner	Course na	me (ECTS)	Inclusion of new generic and specific competences	Inclusion of new topics in course Syllabus	Expansion of current topics (sections) in course syllabus	Inclusion of new practices & activities for the courses	Inclusion of new bibliographic references
	01.	Building materials (7)	No	Yes (1/15)	Yes (1/34)	Yes (4/15)	Yes (3/4)
	02.	Communal Infrastructure (3)	Yes (1/7)	Yes (1/5)	Yes (3/15)	No	No
	03.	Elements of buildings (6)	No	Yes (1/11)	No	Yes (2/11)	Yes (2/7)
	04.	Hydrotechnical Meliorations	No	No	Yes (2/15)	No	No
01/UoM	05.	Introduction to Civil Engineering (3)	No	No	Yes (7/28)	Yes (3)	Yes (1/4)
	06.	Maintaining, Sanitation and Reconstruction of Buildings (5)	No	No	Yes (6/30)	No	Yes (3/8)
	07.	Urban planning basics (5)	Yes (1/6)	No	Yes (5/15)	Yes (4)	Yes (7/10)

4.2 University of Sarajevo (UNSA)

The following table (Table 17) summarizes the modernization process of University of Sarajevo's Master Courses. Two out of three courses have updated their learning outcomes in terms of new generic and specific competences. The three courses have included new topics in course syllabus directly related to Climate Smart Urban Development as well as new practices that allow students to practice and apply the knowledge and skills gained in the new topics of the courses. Finally, the courses have included new references in English that help to support their expansion of content.

No/Partner Course name (ECTS)		Inclusion of new generic and specific competences	Inclusion of new topics in course Syllabus	Expansion of current topics (sections) in course syllabus	Inclusion of new practices & activities for the courses	Inclusion of new bibliographic references	
	01.	Environmental Protection (6)	Yes (2/11)	Yes (1/8)	No	Yes (3/4)	Yes (1/7)
	02.	Urban Roads (5)	Yes (3/16)	Yes (2/13)	No	Yes (2/13)	Yes (2/6)
8/UNSA	03.	Water Protection I (6)	No	Yes (2/78)	No	Yes (3)	Yes (1/3)

4.3 University of Mostar (UNMO)

The following table (Table 18) summarizes the modernization process of University of Mostar's Courses. All the courses have updated extensively their Learning outcomes adding an important amount of new generic and specific competences aligned with the Higher Education European Area. All the four courses have included new topics in courses syllability related to Climate Smart Urban Development respecting the threshold of modernization regarding the original versions of the courses.

There is no detail concerning new practices except for one of the courses. Finally, just one of the courses has included new bibliographic references that can support the update of the content and the inclusion of new topics in the Syllabus.

No/Partner	r Course name (ECTS)		Inclusion of new generic and specific competences	Inclusion of new topics in course Syllabus	Expansion of current topics (sections) in course syllabus	Inclusion of new practices & activities for the courses	Inclusion of new bibliographic references
	01.	Durability, resilience and maintenance of structures (6)	Yes (8/9)	Yes (1/10)	Yes (1/9)	No	No
	02.	Materials for energy efficient and sustainable buildings (5)	Yes (6/7)	Yes (1/7)	Yes (1/6)	Yes	No
	03.	Special types of concrete (5)	Yes (5/6)	Yes (2/13)	No	No	Yes (1/4)
9/UNMO	04.	Sustainable Buildings from natural materials (5)	Yes (5/9)	Yes (2/15)	No	No	No



4.4 University of Bihac (UNBI)

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The following table (Table 19) summarizes the modernization process of University of Bihac's Courses. All the courses have updated their Learning outcomes in terms of new generic and specific competences aligned with the Higher Education European Area, trying to include competences related to Climate Smart Urban Development. Two out of three courses have included new CSUD's topics expanding their Syllabus. The three courses have included new practices and activities that try to use the new equipment acquired in the framework of the Smart WB's project and dynamize and modernize the approach to teaching in the courses. It is important to mention that just one additional bibliographic reference has been included for the Energy Efficiency course.



No/Partner	r Course name r (ECTS)		Inclusion of new generic and specific competences	Inclusion of new topics in course Syllabus	Expansion of current topics (sections) in course syllabus	Inclusion of new practices & activities for the courses	Inclusion of new bibliographic references
	01.	Building materials (5)	Yes (1/7)	Yes (1/15)	No	Yes (1/15)	No
	02.	Energy efficiency (5)	Yes (3/6)	No	No	Yes (1/16)	Yes (1/4)
10/UNBI	03.	Spatial planning (5)	Yes (1/6)	Yes (1/15)	No	Yes (1/14)	No

4.5 European University of Tirana (UET)

The following table (Table 20) summarizes the modernization process of European University of Tirana's courses. To begin with, any of the courses have updated their competences. Regarding the

inclusion and expansion of new topics all the courses have added new topics or expanded the content of some of the original topics that were included in the course. Two out of three courses contemplate the inclusion of new practices and activities. Regarding this aspect, there is a focus on try to use and gain knowledge in the use and application of the software acquired in the project as well as the new instrumental for laboratory. Finally, just one course has included one additional bibliographic reference.

No/Partner	/Partner Course name (ECTS)		Inclusion of new generic and specific competences	Inclusion of new topics in course Syllabus	Expansion of current topics (sections) in course syllabus	Inclusion of new practices & activities for the courses	Inclusion of new bibliographic references
	01.	Architecture Technology (6)	No	Yes (2/14)	No	Yes	No
	02.	Construction Sciences (6)	No	Yes (3/14)	No	Yes	No
11/UET	03.	Urban Design I (5)	No	Yes (1/14)	Yes (1/14)	No	Yes (1/7)

Table 20 - Summary of the modernization process for UET's courses

4.6 Polytechnic University of Tirana (UPT)

The following table (Table 21) summarizes the modernization process of the Polytechnic University of Tirana's courses. Three out of five courses have updated their generic and specific competences. All the five courses have expanded the syllabus, including new topics (2 out of 5) or modifying and expanding the current syllabus (5 out 5). Regarding the practical work for these courses is focused on gaining knowledge in the management of geodetic instruments and the application of geodetic methods in the different courses related to Geodesy. Finally, it is important to mention that none of the courses have added new bibliographic references.

Table 21 - Summary of the modernization process for UPT's courses

No/Partner	Coui	rse name (ECTS)	Inclusion of new generic and specific competences	Inclusion of new topics in course Syllabus	Expansion of current topics (sections) in course syllabus	Inclusion of new practices & activities for the courses	Inclusion of new bibliographic references
	01.	General Geodesy 1 (6)	Yes (5/8)	No	Yes (5/12)	Yes	No
	02.	General Geodesy 2 (7.5)	Yes (1/7)	No	Yes (2/14)	Yes	No
	03.	Knowledge of urban planning and projects (4)	No	Yes (1/12)	Yes (1/12)	No	No
	04.	Topographic surveys and State Geodetic networks 1 (6)	No	Yes (1/12)	Yes (2/12)	Yes	No
12/UPT	05.	Topographic surveys and State networks 2 (7.5)	Yes (3/8)	No	Yes (3/12)	No	No

4.7 Polis University (UPOLIS)

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The following table (Table 22) summarizes the modernization process of Polis University. The four modernized courses have included new topics in course syllabus as well as new practices and activities related to the Climate Smart Urban Development field trying to dynamize the course and raise awareness of potential differences between the European Union and the current situation in Albania. Three out of four courses have added bibliographic references in English that support the inclusion of new topics and provide tools to develop the practical activities that have been included in the courses.

No/Partner	Coui	rse name (ECTS)	Inclusion of new generic and specific competences	Inclusion of new topics in course Syllabus	Expansion of current topics (sections) in course syllabus	Inclusion of new practices & activities for the courses	Inclusion of new bibliographic references
	01.	Geographic Informational systems (6)	No	No	Yes	Yes (1)	No
	02.	Local Governance (6)	No	Yes (1/15)	No	Yes (2)	Yes (3/14)
	03.	Urban Economics (3)	No	Yes (1/12)	No	Yes (2)	Yes (4/8)
13/U_POLIS	04.	Urban planning (6)	No	Yes (1/19)	Yes (4/19)	Yes (1)	Yes (8/16)

Table 22 - Summary of the modernization process for UPOLIS' courses

5. Conclusion

One of the key tasks included in the SmartWB project is the Modernization of University courses in collaboration with industry sector. It is evidenced in the very title of the Erasmus Plus project "Curricula Innovation in climate-smart urban development based on green and energy efficiency with the non-academic sector". The logic behind this task is to provide future professionals in key jobs related to Urban Development in Albania, Bosnia and Herzegovina and Montenegro with the awareness, knowledge and skills which allow them to take a more "smart" and "sustainable" approach and address the challenges posed by climate change in their respective countries.

European Union and Third countries associated to the Programme have already been taking steps towards climate neutrality, sustainability, and digitalization for several years in the field of Urban Development. The approach has been basically of a collaborative nature trying to actively engage civil society, government, public entities, private business and academia. One of the results of this collaboration at the Higher educational level has been an updated curricula offering a wide range of courses in bachelor and master's programs related to climate-smart urban development. Evidently and according to SmartWB's Erasmus Plus project, the modernization of the courses of third countries not associated to the Programme should be aligned with these regional and European developments.

Consistently, based on the courses proposed by Western Balkan's universities the modernization process described in this report has adopted a highly cooperative and collaborative approach. To begin with, the Collaboration between the non-academic industry sector and Higher Education Institutions in each one of the countries has been considered key to develop innovative curricula that promote green and energy-efficient solutions for urban development that are aligned with the needs of academia, industry, business, and professionals. In addition to that, EU and Countries non-associated to the



Programme SmartWB's academic partners have had the capacity to provide support and aid in order to update courses' content including in the Syllabus new topics and issues related to Climate Smart Urban Development, updating students' competences and learning outcomes and presenting new teaching methodologies and state of the art technological developments which contribute to a smarter and more sustainable approach to the field.

Smart WB's project proposals stated that "at least twenty courses should be modernized by Month sixteen (April 2024)". To conclude this report, it is important to highlight that this objective has been achieved given the fact that finally a total number of twenty-nine courses have been modernized. The modernization has been developed according to the methodology that is described in detail along the report and that has been implemented in project's first year from January 2023 to February 2024. According to project's plan, these courses are prepared for actual test teaching in the Third year of the project.