

**CiViTAS**  
Cleaner and better transport in cities

**DYN@MO**

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## Implementation Status Report K1.4: Final version of the curriculum for sustainable mobility studies at the Koprivnica University

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**Project Partners**

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## 1. Executive summary

Within the CIVITAS DYN@MO project the City of Koprivnica has developed a comprehensive study programme in clean urban mobility. The objective of the measure was not only to develop the curriculum but to closely monitor the process of the development of the curriculum, from the research activities, tendering to the testing and validation of the document.

The curriculum was completed in July 2016 and the comprehensive documentation needed for the validation process was handed over in September 2016. It is expected that the programme will start to be taught at the university in 2017 and it will be the first educational institute in southeast Europe to offer a programme in clean urban mobility.

The curriculum was developed by the City of Koprivnica and the University North together with a consortium of four partners (OIKON – Institute for Applied Ecology, Pro rail Alliance, MCRIT sl. and Fraunhofer Institut) that acted as external expert in the process of developing the document.

## 2. Measure description

The north-western region of Croatia has been traditionally lagging behind the rest of Croatia in the offer of high educational institutions which had a large influence on the negative educational structure of the population of this part of Croatia. The negative educational structure means that the most prevailing level of education is secondary education that does not bring a lot of additional value to the local economy.

Therefore, in 2008 the City of Koprivnica and the City of Varaždin started the initiative to develop a university in the north-western part of Croatia, serving the local economy and improving the educational structure of the local population. In 2008, the City of Koprivnica bought a private educational institution, Media Uni, with the intention of transforming the institution into a university. The process had to be developed with support from the Croatian government. The establishment of the new university was initially planned for 2013. The plans were interrupted through the long-term economic crisis in Croatia, which did not allow any government funding for new educational institutions in Croatia. Therefore, the university has been mostly funded by the City of Koprivnica until the 29<sup>th</sup> of May 2015 when the Croatian government decided to establish a new university, however based on two existing higher education facilities, the Media Uni located in Koprivnica and the Varaždinsko Veleučilište located in Varaždin. The new institution became the eighth public university in Croatia.



**Figure 1: University North building in Koprivnica**

The objective was that one of the backbones of the university would be the existing local economy and the need of this local economy for skilled and educated labour force. Also, the support of the cities and regions taking part in this initiative and the preferences was crucial for the development of the university.

The City of Koprivnica has always had a strong background in implementing sustainable mobility measures. This started with the accentuated use of bicycles in the everyday life of the citizens of the City of Koprivnica, development of cycling infrastructure, winning of European Mobility award, etc. This has been followed by many EU funded projects that mostly had the goal to implement new and innovative measures in sustainable mobility.

All of this has been followed by the increase of the capacity of the city administration in the field of sustainable mobility and also the increased capacity of the partners that participated in the work of the expert mobility groups that were set up during the development of the city's first Sustainable Urban Mobility plan (SUMP).



Figure 2: University North logo

So, the decision of the city administration was to develop a new study programme of sustainable mobility in order to exploit the mentioned achievements.

The CIVITAS DYN@MO project enabled the City to develop such a curriculum in clean urban mobility. This curriculum (in English) consists of the concept, detailed module descriptions, programme structures, learning outcomes and student assessment methodologies. Once validated through the Croatian university system it will be fully compatible with the European Credit Transfer System and in line with the Bologna Agreement.

### 3. Curriculum development

This chapter describes the steps that were taken in order to develop a curriculum in clean urban mobility. The curriculum was developed between 18<sup>th</sup> of February 2016 and 1<sup>st</sup> of June 2016. It was developed by a group of experts that were chosen based on a public tender in 2015. Both, City of Koprivnica and the University North provided support to the group of experts.

#### 3.1 Research activities on similar study programs in Europe and development of the tender documentation

In order to conduct the tender process the project team of the City of Koprivnica had to conduct a comprehensive research on existing sustainable mobility study programs in Europe. The research was directed at creating a framework for the future work on the curriculum in Koprivnica, the future steps that have to be taken and the outlines of the project documentation for the project assignment for the tender for external expertise to develop the curriculum.

The project assignment was developed by the University North and the City of Koprivnica (Annex 1) and was set up in a way that the final product would be a curriculum that is fully compliant for the validation process by the national Agency for Education.

### 3.2 Tender for external expertise

On 27<sup>th</sup> of October 2015, City of Koprivnica launched a public tender for the purchase of external expertise services for the development of a curriculum in clean urban mobility. Because the presumed cost of the purchase was approx. 47,000 € (350,000 kn), the tender had to go through a public tendering process according to the law on public procurement. The document that was developed together with representatives from University North served as a project description of the tendering process. The tender documentation held all the necessary documents for this kind of process. One innovation that was connected with the tendering process was the use of the several criteria in choosing the winning offer. Instead of the most common way, choosing the cheapest offer, the choice was to use – besides price criteria – criteria on the experience of the tenderers in the following areas:

- a) number of participations as a partner in EU funded projects that deal with sustainable mobility,
- b) number of participations as a lead partner in EU funded projects that deal with sustainable mobility, and
- c) number of SUMP's developed for third parties.

On 1<sup>st</sup> of December 2015 the tender was finished and the evaluation process on the received offers begun. In total there were three offers with the following prices:

1. Biro skiro, Pod jelšami 10, 1000 Ljubljana, Slovenia: **350,000 kn (47,000€)**
2. Faculty of transport, Vukelićeva 4, 10000 Zagreb, Croatia: **350,000 kn (47,000€)**
3. Consortium of tenderers consisting of:
  - Oikon d.o.o., Trg Senjskih uskoka 1-2, 10020 Zagreb, Croatia
  - Rail for Alliance, Trnjanska 11f, 10000 Zagreb, Croatia
  - Mcrit, Spain
  - Fraunhofer Institut, Germany: **289,700 kn (38,627€)**

The result of the scoring was the following:

1. Biro skiro, Pod jelšami 10, 1000 Ljubljana, Slovenia – **53.4/100 points**
2. Faculty of transport, Vukelićeva 4, 10000 Zagreb, Croatia: **53.4/100 points**
3. Consortium of tenderers (Oikon, Rail for Alliance, Mcrit, Fraunhofer Institut) – **74/100 points**

With 74 out of 100 points the Consortium of tenderers (Oikon, Rail for Alliance, Mcrit, Fraunhofer Institut) won the tender. On 16<sup>th</sup> of February 2016 a contract was signed between the City of Koprivnica and the Consortium of tenderers for the development of the curricula. The deadline for the delivery of the documents was the 1<sup>st</sup> of June 2016 for a price of 289,700 kn (38,627€). The document was delivered on time.

### **3.3 Development of the curriculum**

The City of Koprivnica, University North and the Consortium of tenderers (Oikon, Rail for Alliance, Mcrit, Fraunhofer Institut) jointly developed the curriculum for clean urban mobility.

Since the Consortium of tenderers had the most expertise for the development of such a document, a large part of the work was conducted by them. The City of Koprivnica participated in the overall management of the development activities, was in charge of the communication between the Consortium of tenderers and University North.

University North acted as a support for the Consortium of tenderers, especially in terms of adapting the curriculum for the validation by the competent public body, in this case the Croatian Agency for Education.

### **3.4 Testing of the curricula**

During July 2016 a testing of the curriculum/ study programme was undertaken in order to evaluate the curriculum, highlight any mistakes if they exist and/ or to propose corrections if they were needed (Annex 2). The curriculum was tested by two institutions that are experts in the field of sustainable mobility, Mcrit s.l. from Spain and Fraunhofer Institut from Germany.

### **3.5 Validation of the curriculum**

The establishment of the University North led to some changes in measure implementation. On the one hand, it made the situation for the City of Koprivnica easier, since it did not fund the work of the Media Uni anymore but from the CIVITAS DYN@MO project perspective, it had complicated some aspects of the measures. One of the larger complications was neither the City of Koprivnica nor the Media Uni were able to hand over the request for the validation of the curriculum since the legal follower is the University North that took over all teaching staff. This issue was solved in the following way: the City of Koprivnica developed the curriculum. University North developed – at their own costs – the project documentation in a way that the final product, the curriculum, was to be adapted and ready for validation. The City of Koprivnica gave the University North insight into the final product, the curriculum, and upon that it made an elaborated curriculum for the start of the validation of the curriculum and the establishment of the new study programme on clean urban mobility. University North obliged itself to establish a clean urban mobility department in

Koprivnica, where it will conduct the study programme. Thereafter, the elaborated curriculum was handed over to the Agency for Education for the validation.

## 4. Curriculum for Sustainable Mobility Studies at the Koprivnica University – Summary

The final document was delivered according to the contract between the City of Koprivnica and the community of bidders, on the 1<sup>st</sup> of June 2016. The final details of the curriculum are the following:

- Study Programme Name: *“Održiva mobilnost i logistika”, abbreviation: OMiL*
- English Name of the Study Programme: *“Sustainable mobility and logistics” (SML)*
- Holder/ organizer of the study programme: *University North, University Centre Koprivnica, Department of Technical and Economic Logistics*
- Study Programme Type: *University study (full-time and part-time study in accordance with the study plan and curriculum)*
- Study Programme Level: *Two-year graduate Programme*
- Scientific or artistic area: *Technical Sciences*
- Scientific or artistic field: *Traffic Technology and Transport*
- Scientific or artistic branch: *Intelligent Transport Systems and Logistics*
- Academic title awarded upon completion of the studies: *Master/ Master engineer in Transport and Logistics*

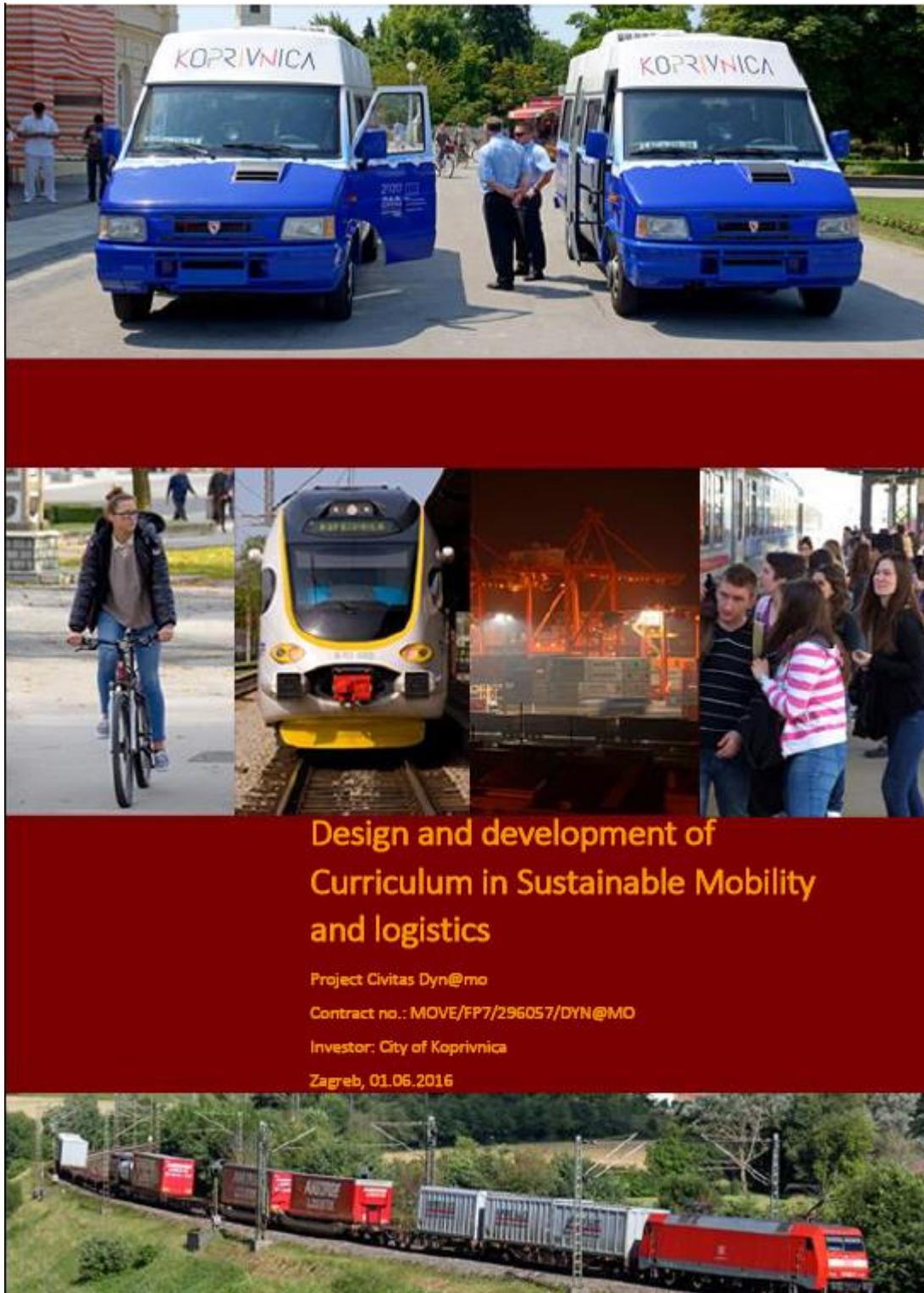


Figure 3: Title page of the developed curriculum

The authors suggested that the study programme would be carried out in four semesters and that a student can earn a minimum of 120 credits.

Table 1 Study Programme Schematic representation			
University graduate study			
Sustainable mobility and logistics			
120 ECTS (4 semesters) mag. ing. traff. log.			
Semester I		Semester II	
Course: Sustainable Transport Systems ( <i>Održivi prometni sustavi</i> )		Course: Logistics Systems Management ( <i>Upravljanje logističkim sustavima</i> )	
Semester III	Semester IV	Semester III	Semester IV

Figure 4: Study programme schematic

At the end of the studies, the students must gain important knowledge and skills for their future careers, such as: ability to analyse, synthesise and design solutions to complex problems in the field of transport planning and traffic management processes; develop critical thinking; the ability for self-study, linking knowledge, adaptation to new relationships (flexibility); the ability to use research methods and procedures; ability to creatively search for solutions development and other problems of institutions or companies, their organisation and management and other highly qualified jobs in the field of transport, or the development and application of scientific and professional achievements. The acquired knowledge and skills shall help in changing modes of transport planning in the EU and in other countries in the region.

After completing the two-year university programme graduates, as a result of learning, students must be competent to be actively involved in strategic planning processes, including knowledge of the basic elements of urban economics and geography, spatial planning, and particularly space-transport planning and modelling.

In particular, students should qualify for the possibility of a strategic, tactical and operational thinking transportation planning and traffic processes. Students should obtain a basic understanding of the necessity of interdisciplinary research, planning and design of transport systems depending on the needs of a balanced sustainable development of individual urban units and their strategic plans and guidelines. They must be able to identify and analyse the correlation of traffic and uses of the land in designing and developing sustainable mobility and logistics.



<i>Project Name:</i>	Design and Development of the Curriculum in Sustainable Mobility –Civitas Dyn@mo Project	
<i>Investor:</i>	City of Koprivnica Civitas Dyn@mo	
<i>Project Initiator:</i>	 	Pro-Rail Alliance OIKON d.o.o.
<i>Subcontractor:</i>		MCRIT S.L., Fraunhofer ISI
<i>Contract Number:</i>	36/16 MOVE/FP7/296057/DynG@ MO	
<i>Project Type:</i>	Research and development	
<i>Part of the project</i>	Curriculum	
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Design and development of Curriculum in Sustainable Mobility and Logistics 2

**Figure 5: Basic information on the curriculum development**

Students should be trained to master the most important elements in the implementation of modern transport systems and in particular for the design and use of tools in the context of intelligent transport systems. They must have the most knowledge of the urban economy and the basics of the theory of location, distribution and organisation in space. An important part of the readiness for analytical or technical and economic assessment of individual transport phenomena

and the ability to provide integrated critical reviews and concluding the modelling and implementation of optimal transport network (infrastructure and superstructure).

Special knowledge must include the preparation and planning of investment projects and models of investment and financing in the transport infrastructure and superstructure (loans, EU funds, public-private partnerships, project finance, etc.). Furthermore, they must have basic knowledge and skills of project management (during the life cycle of the project).

After graduation, the student will continue to be able to solve complex logistical tasks of the level of the company to a level of more complex systems of urban units (cities, regions, etc.) in order to optimise their operations.

Upon completion of two years of the university graduate study “Sustainable mobility and logistics”, the student should have acquired the following core competences (in accordance with the understanding of the key skills in the European and Croatian Qualifications Framework):

- **Development of strategic development documents:** Development strategies and physical planning documents of all levels and especially in the field of transport and transport infrastructure. Due to the interdisciplinary field students should acquire a high level of skills in team work on the development of spatial plans and (regional and local) development strategies such as the analysis of transport needs, defining optimised transport networks and services, multi-criteria analysis of transport solutions, interdisciplinary consideration of transport needs and problems (economic, environmental, transport, etc.).
- **Development of transport strategies and study all levels:** Students should acquire the skills to connect the various theoretical approaches and different organisational models of the transport system and its application/ implementation.
- **Project management in the domain of transport:** Students should acquire basic knowledge and skills for the preparation, implementation and exploitation of projects in the domain of transport engineering.
- **Optimization and modelling of transport systems in urban areas:** Students should acquire basic knowledge and skills needed for the optimisation and improvement of the transport system in urban areas, with special emphasis on public transport of passengers and deployment of intelligent transport systems in order to optimise the transport process.
- **Knowledge in ecology:** Through a comprehensive understanding of traffic impacts on people, nature and the environment, students should be able to qualitatively and quantitatively evaluate the effect of implementation of certain traffic solutions.
- **Knowledge in economy:** Given the interdisciplinary area students should acquire basic knowledge of economic development at the national, regional and local level. Knowledge interdependence and interaction of economic and traffic indicators and should be familiar with the basics of making financial and socio-economic analyses of specific transport operation. Moreover students should acquire knowledge in management and management of complex

systems and business processes in order to complete and sustainable further development and ensure synergy effect of all factors of integrated sustainable development.

- **Optimization and modelling of transport systems in urban areas:** Students should acquire basic knowledge and skills needed for the optimisation and improvement of the transport system in urban areas, with special emphasis on public transport of passengers and deployment of intelligent transport systems in order to optimise the transport process.
- **Knowledge in ecology:** Through a comprehensive understanding of traffic impacts on people, nature and the environment, students should be able to qualitatively and quantitatively evaluate the effect of implementation of certain traffic solutions.
- **Knowledge in economy:** Given the interdisciplinary area students should acquire basic knowledge of economic development at the national, regional and local level. Knowledge interdependence and interaction of economic and traffic indicators and should be familiar with the basics of making financial and socio-economic analyses of specific transport operation. Moreover, students should acquire knowledge in management and management of complex systems and business processes in order to complete and sustainable further development and ensure synergy effect of all factors of integrated sustainable development.

## **5. Annex 1 – Project assignment**

## **6. Annex 2 – Curriculum testing**

UNIVERSITY NORTH



Sveučilište  
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DYN@MO PROJECT TASK FOR THE DEVELOPMENT OF THE  
CURRICULUM FOR A TWO-YEAR STUDY PROGRAM ON  
**„SUSTAINABLE MOBILITY“**

Area: technical sciences; field: traffic technology and transport  
for University North (University center Koprivnica)

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## 1. Introduction to the new graduate study program

Activities on the development of the curriculum of a new two-year university graduate Study Program on "Sustainable mobility" at the Department of Technical and Economic Logistics at University North are carried out within the framework of the CIVITAS project DYN@MO. **The main goal of the new study program is to educate and promote** a new generation of multi-skilled transport professionals (planners, economists, engineers, etc.) to apply improved planning methods and tools, evaluate frameworks and policy interventions, consider longer-term impacts of transport and mobility actions, build pathways and apply measures for achieving sustainable urban mobility.

## 2. Background to the CIVITAS DYN@MO PROJECT<sup>1</sup>

The City of Koprivnica and Development Agency North DAN are partners in the CIVITAS DYN@MO project. The project is implemented under the FP7 program, 7<sup>th</sup> Framework Program for Research and Technological Development of the European Union from which the research and development for the DYN@MO project is financed, in order to increase the competitiveness of local economy based on the practical use of the latest scientific knowledge.

The DYN@MO project focuses on developing the most effective measures for sustainable traffic on the basis of electro-mobility and planning for sustainable urban transport. It was approved as part of the CIVITAS initiative, in the CIVITAS Plus II cycle (2012-2015). The project involves a consortium of 28 partners and is carried out in four cities in Europe: Aachen (DE), Palma de Mallorca (ES), Gdynia (PL) and Koprivnica (HR).

Local partners of City of Koprivnica in the project are city companies Kampus d.o.o. and Komunalac d.o.o., Development Agency North DAN, Čazmatrans Nova d.o.o. and HŽ Infrastruktura.

The strategic objective of the CIVITAS DYN@MO project is to develop a 'Mobility 2.0' services by using Web 2.0 technologies, encourage transport solutions that promote the use of electric and hybrid vehicles and launch a public debate and education on urban transport planning and possibilities of improving transport services. Specific objectives are set out in four levels:

- strategic level: to encourage the culture of interactive planning of mobility in which all citizens (residents) and other stakeholders can actively participate in the planning through the innovative dynamic processes
- technical level: to use a clean, energy-efficient transport, with particular emphasis on promoting the use of electric vehicles and advanced ICT and ITS systems as the basis of innovative transport services
- service level: to acquaint residents and travelers in cities with innovative hotspots with existing and new mobile services

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<sup>1</sup> Source: [www. http://koprivnica.hr/projekti-grad/civitas-dynmo/](http://www.koprivnica.hr/projekti-grad/civitas-dynmo/) (21 May 2015)

- European level: to encourage politicians and other decision makers from cities involved in the CIVITAS DYN@Mo project to actively contribute to a European exchange and learning through summer schools and training and the development of centers of competence for sustainable urban mobility planning (SUMP).

The four cities in the DYN@MO project proposed completing packages with a high degree of transferability across Europe. The city of Koprivnica planned to implement 6 measures:

- Planning the public transport system,
- Development and adoption of a Sustainable Urban Mobility Plan (SUMP),
- University campus with zero CO<sub>2</sub> emissions,
- Public transport with low emissions,
- **Development of Curriculum for sustainable transport for Koprivnica University and**
- Car-sharing program for electric city cars.

Realization of the measure Creating curriculums for clean urban mobility for the (former) University of Koprivnica (now University North) will allow to:

- Raising awareness about the importance of clean urban mobility in the city and the region
- **Run a new university program for clean urban mobility planning**
- Establishing cross-border cooperation and learning between the partner cities included in the project as well as other cities
- Initiating the development of Sustainable Urban Mobility Plans -SUMP in the region

## 2.1. Innovation of the new study program

The aim is to make the new University (in Koprivnica) the first educational institution in South-Eastern Europe, which will **offer clean urban mobility planning programs**. This will enable the education of a **new generation of transport professionals** in this geographical region. Their acquired knowledge about innovative techniques will help them make changes to modes of transport planning in the EU and in other countries in the region.

## 2.2. Preparing the new study programs

When developing the curriculum it is necessary to establish cooperation with partner Universities in Edinburgh, Ljubljana, Zagreb and the regional branch of the University Veszprem in Nagykanizsa, Hungary. It is necessary to analyze and present a brief overview of existing curricula for clean urban mobility in other selected EU member states and to identify best practices and analyze shortcomings.

## 2.3. Implementation of the new study program

Curriculum development in English - a detailed description of modules, the structure of the program, the objectives of education and the methodology of knowledge assessment - to establish a program which will be fully compatible with the European system of grading and the Bologna agreement, using materials developed at the SUMP Center of competence.

The actual materials for students (exercises, study tours, lecture notes and slides) are not the subject of this measure.

**The official adoption of the program in accordance with the Croatian university system in order to gain Government support for this program.**

#### 2.4. Evaluation of the new study program

The evaluation will be focused on the curriculum development process. An especially valuable element in this measure is a collaboration between the various institutions that will be evaluated through the development of their joint work plan. The success of the City of Koprivnica as the leader of this measure will be monitored throughout the whole process. A second important element is the ability to transfer knowledge about this measure.

#### 2.5. Dissemination of the new study program

The wider region, which mostly refers to the Southeast part of Europe, countries like Slovenia, Bosnia and Herzegovina, Serbia, Montenegro and Macedonia will be involved in the dissemination since the curriculum needs to draw potential students from the region. The number of students who will be included in future studies at the University of Koprivnica and the number of young professionals interested in the planning of sustainable mobility will be a direct indicator of a measure performance.

### 3. Syllabus task

In accordance with the requirements of the CIVITAS DYN@MO project, it is necessary to prepare the **curriculum as a basis for the development of a comprehensive Elaborate on the study program** for the new two-year graduate study program on "Sustainable mobility". Student workload of the study program must be at least 120 ECTS credits, and together with undergraduate study program, the overall workload cannot be less than 300 ECTS credits. The workload must be proportionally deployed and consist of 30 credits per semester with clearly distributed ECTS load for each subject. The preparation of the final thesis is carried out in the fourth semester, alongside the regular classes and is valued with ECTS credits.

Upon completing the study program, the title of a Master in Sustainable Transport Planning would be gained and abbreviation mag.ing.sust.traff.plan could be placed behind the first and last names, according to Law on Academic and Professional Titles and Academic Degrees<sup>2</sup>.

The new graduate degree program on "Sustainable Mobility" (master degree) must be open for horizontal and vertical connections and ensure the mobility of students at national and international levels. Horizontal connections must be provided with all studies organized according to the principles of the "Bologna" process. The vertical connection is provided through ability of Bachelors of undergraduate studies in technical and social fields to transfer to the undergraduate study program of "Sustainable Mobility".

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<sup>2</sup> The Law in addition to definitions of academic and professional titles also defines the ways of their acquisition

The study program needs to be designed as an interdisciplinary study with the purpose of offering educational content that will provide students with better communication with the labor market in order to ensure the planning, implementation and management of the traffic system in the optimal way taking into account the efficient and environmentally friendly use of means of transport.

The concept underlying the creation of this program content must take into account the needs of the labor market in the private and public sectors. They have to use the knowledge of related study programs in EU countries, take into account the trends and requirements of international best practice examples, which must be based on modern scientific and expert knowledge. The program must be prepared in a way that allows a Master in Sustainable Transport Planning to enroll in doctoral studies in related fields, as well as the related doctoral studies depending on conditions prescribed by tender.

### **3.1. Development of a curriculum for a two-year university graduate study program "Sustainable mobility"**

When preparing a new study program it is necessary to pay special attention in order for the new course to be:

- at the level of the newest scientific findings and connected skills;
- compatible with the strategic documents of network of higher education institutions;
- fit with national priorities and needs of the professional sector;
- comparable compatible course units with the ones in other programs in the European Union.

Within the framework of the curriculum of a new two-year university graduate study program "Sustainable Mobility" it is necessary to examine the overall potential of the University North as well as the North-Western Croatia and analyze the needs and optimal models of structuring the program. When developing the curriculum it is necessary to take into account the existing and (possibly) necessary scientific, teaching and other staff at the University of North, as well as the physical capacity of the University to conduct classes. It is necessary to analyze the laboratory equipment (including venue, equipment, software tools, etc.) necessary for the implementation of a study program.

It is necessary to analyze the possibility of conducting a joint study program at the national level but also with the universities in the EU. There should be scope for learning from other countries and cities via exchanges and/or study visits and definitely from material that is based on studying how other places have addressed sustainable mobility.

The program must ensure the acquisition of learning outcomes, but also retain the flexibility that will allow adaptation to the constant and rapid changes in the wider social context. It is important that the desired outcomes are based on competences that students would gain and not on the content students learn theoretically and by heart.

The study program would be conducted as a program for regular students as well as a program for part time students. The proposal for the programs for full and part-time students must be distinguished in the curriculum, according to the characteristics of the above mentioned studies.

It is mandatory to prepare a feasibility study of the study program in accordance with strategic document network of higher education institutions<sup>3</sup>.

### 3.2. Objectives of the new study program

In accordance with the requirements of the CIVITAS DYN@MO project, the new two-year graduate program of "Sustainable mobility" must allow the creation of a new generation of multi-skilled transport professionals (planners, economists, engineers, etc.) to apply improved planning methods and tools, evaluate frameworks and policy interventions, consider longer-term impacts of transport and mobility actions, build pathways and apply measures for achieving sustainable urban mobility. It is an interdisciplinary study program that integrates knowledge, namely from the domains of transport, urbanism, economic and ecological areas, and is especially oriented towards integrated planning of regional development, with the special emphasis put on sustainable mobility..

The curriculum of university graduate study program on „Sustainable mobility“ should contain courses in the field of technology, economics, law, engineering and the rationalization and optimization of sustainable development processes , especially the transport planning process. The content of the study program should be based on principles that strive to meet the permanent market demands for professionals who are able to carry out the whole development process and the overall transport process from the point of departure to the point of arrival while using modern technological, technical, economic and environmental knowledge. Students must acquire important competencies for their future career as masters of traffic, such as: the ability to analyze, synthesize and design solutions to complex problems in the field of transport planning and traffic management processes; develop critical thinking; ability for self-study, link knowledge, adapt to new relationships (flexibility); ability to use research methods and procedures; ability to creatively search for solutions of developmental and other problems of institutions or companies, their organization and management and other highly skilled tasks in the field of transport, and develop and apply scientific and professional achievements. The acquired knowledge **will help in changing modes of transport planning in the EU and in other countries in the region.**

After completing a two-year university graduate program (master degree) students, as a result of learning, must acquire knowledge and be trained for active involvement in the processes of strategic planning, including knowledge of the basic elements of urban economics and geography, spatial planning and especially spatial-transport planning and modeling.

In particular, students must acquire the strategic, tactical and operational considerations of transportation planning and traffic processes. Students must learn basic ideas about the necessity of interdisciplinary research, planning and designing the traffic

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<sup>3</sup> Higher education institution and study programs network in Croatia, Chapter 3.4

systems depending on the needs of a balanced sustainable development of certain urban entities and their strategic plans and guidelines. They must be able to perceive and to analyze the correlation of traffic and land used in order to ensure adequate availability with a clear understanding of the conceptual difference concepts accessibility and mobility. They must be educated to master the most important elements in the implementation of modern transport systems and especially in the design and use of tools in intelligent transport systems. They must understand the most important ideas of the urban economy and the basics of the theory of location, distribution and organization in space. An important part is also the willingness for analytical, technical and economic considerations of individual transport phenomenon and the ability of providing a critical integrated review and making conclusions when modeling and implementing optimal transport network (infrastructural and suprastructural).

Special knowledge must cover the preparation and planning of investment projects and models of investment and financing in the transport infrastructure and supra-structure (loans, EU funds, public-private partnerships, project financing,...). Furthermore, students must acquire basic knowledge and skills of project management (during the whole life cycle of the project).

After graduation, students will be able to solve complex logistic tasks from company level to level of more complex systems of urban units (cities, region...), in order to optimize their operations.

After completing two years of university graduate study program on „Sustainable mobility" students should acquire the following key competences (in accordance with the understanding of key competences in European and Croatian Qualifications Framework):

- **development of strategic development documents** (development strategies and documents of spatial planning at all levels, especially in the field of transport and traffic infrastructure, strategy of sustainable urban mobility-SUMP, ...) - considering the interdisciplinary nature of the field, students acquire a high level of skills in team work on the work of spatial planning and (county and local) development strategies, such as the analysis of traffic needs, defining optimal transport networks and services, multi-criteria analysis of transport solutions, interdisciplinary consideration of transport needs and problems (economic, environmental, transport, ... ) .
- **development of transport strategies and studies on all levels** – students acquire skills of linking different theoretical approaches and different organizational models of transport system and their application / implementation.
- **project management in the domain of transport** - students acquire basic knowledge and skills for the preparation, implementation and exploitation of the projects in the domain of transport engineering.

- **optimization and modeling of transport systems in urban areas** – students acquire the basic knowledge and skills required for optimization and improvement of traffic courts in urban areas, with special emphasis on public transport passengers and the implementation of intelligent transport systems in order to optimize the transport process.**environmental competencies** - through a comprehensive consideration of the traffic effects on people, nature and the environment, students will be able to qualitatively and quantitatively assess the effects of the implementation of individual transport solutions.
- **economic competence** - given the interdisciplinary nature of the field, students acquire fundamental knowledge of economic development at the national, regional and local level. They also recognize the interdependence and interaction of economic and transport indicators and are familiar with the basics of making financial and socio-economic analysis of specific transport operation. Furthermore, students acquire knowledge in the field of management and running of complex systems and business processes with the purpose of comprehensive and sustainable further development and to ensure the synergy effect of all factors of integrated sustainable development.

After completing the program, students must be trained to do the following:

- draft the regional and local development strategies and studies and plans of total local development
- prepare documents of spatial planning at all levels - in the field of transport
- develop transport strategies and studies and traffic projects - such as Master plans of development of the transport system, Strategy of sustainable urban mobility, other sector strategies and studies. Specially to learn how to select specific measures to include in strategies and include public consultation and participation in the development of strategies
- analyze the impact of existing and planned spatial and urban activities on the transport process (impacts on mobility and accessibility)
- analyze the generated and induced traffic demand at all levels (supranational, national, regional, local )
- use modern software tools for transport modeling (macro and micro - e.g. PTV VISUM; HCS; SYNCRO, ... ) as the basis for the proposal, selection and implementation of optimum traffic models when making strategic and implementation development documents
- use of modern tools for technical drawing ( like AutoCAD )

- know energetic, spatial, economic and secure aspects of modes of transport in urban areas
- know the basic characteristics of non-motorized ways of travel (walking, cycling), taxi transport, public urban transport passenger, transport on call, motorized travel using personal vehicles, car sharing with the personal vehicles (car-pooling, car-sharing), delivery transport and distribution of goods in urban areas
- know technological characteristics and the classification of urban and suburban transport by: motor, mode of transport, range, and specificity – mobility management especially in the field
- know limitations of transport models and to be able to ask useful questions of modelers if student are the client for the model but not a modelling expert
- analyze and integrate all transport modes in order to form efficient public transport passenger.
- use the basic criteria in selecting the technology of urban transport, select and apply optimal models of implementation of public transport passenger (on national, regional and local level) and route optimization of transport resources
- create and optimize timetables of passenger public transport (road and railway transport)
- know basic elements to secure accessibility for people with reduce mobility
- know basic knowledge of psychology of transport-user behavior
- know basic elements of Smart mobility
- apply ICT and ITS in running and managing traffic in urban areas
- manage and optimize automatic traffic management in cities
- model and manage logistics systems at all levels, from company to regional and local government with the purpose of optimizing business
- model and manage business processes in order to optimize business
- consider basic location methods
- know basic elements of the multi-criteria analysis
- know basic macroeconomic indicators and their correlation with the generating traffic demand
- know basic elements of urban economy
- participate in the development of feasibility studies and studies of socio-economic justification in the domain of determining traffic indicators (including analysis external costs)

- participate in the development of environmental impact studies and other studies that serve as the basis for determining the environmental impact of transport solutions
- (...)

### **3.3. Content of the program and definition of modules**

The Curriculum must be prepared in English and Croatian with a detailed description of modules, structure of the program, objectives of education and methodology of knowledge assessment to establish a program that is fully compatible with the European system of evaluation and Bologna agreement, using the materials developed at the Center of competence for SUMP. Detailed competencies acquired by the students in individual courses must be listed while describing the courses.

The study programs must adequately examine theoretical and practical experiences and be structured so that the theoretical assumptions can be proved in the lab or in the future Centre of competence for sustainable mobility or through case studies.

Classes during the graduate university study program should be held according to the curriculum and program that includes a significant number of elective courses, including the possibility of traineeship in a variety of topics. This allows students a flexible creation of contents in accordance with their abilities and interests. Along with their regular academic contents, programs should additionally build up the connection between students and international experience and practice.

The theme of the new course shall be sound to attract a higher number of potential international students. For this purpose, a Master level study program shall give the possibility of filling-up a market gap at the regional/European level. A more specific course topic is “Sustainable Urban Mobility Planning”.

An important part of the study program is to educate students on the models of urban transport (depending on the size of the urban environment, economic development and topographic features etc.), particularly in process models integrated transport systems, urban transport system and models for managing parking lots and delivery systems in urban areas.

The new program shall include English as one of the languages. It shall clearly define which modules shall be necessarily taught in English.

Program shall be structured in a modular structure (with ECTS credits for each unit). The description shall include:

- overview of program (introduction, what students will learn, assessment methods);
- list of Modules (distinguish between compulsory modules – those which are common and obligatory from those modules that are optional),
- admission requirements, accreditation (country or expected regional accreditation in the near future) and
- possibility of cooperation with other universities (e.g. cross-border universities, partners in DYN@MO, etc.).

In the front is the list of proposed compulsory and optional modules that shall be included in proposition of the new study program.

The following list of compulsory modules shall be analyzed and (if possible) recommended for all students:

- Sustainable urban mobility planning;
- Transport policy and impact analysis methods;
- Transport data collection and analysis;
- Planning integrated transport (public transport, non-motorized, etc.);
- Introduction to transport economics and appraisal;
- Models of Land Use – Transport Planning;
- Mathematical Methods in Transport;
- Introduction to Physical Planning;
- Introduction to Regional Development;
- Dissertation;
- (...)

The following list of optional modules shall be analyzed and (if possible) recommended for all students:

- Behavioral analysis methods/Choice modelling and stated preference design;
- Transport safety analysis;
- Smart mobility and electric vehicles;
- Transport investment appraisal;
- Public Participation and Social Media;
- Climate change impacts, adaptation and mitigation, etc.
- Transport and Urban Pollution;
- Low Carbon Logistics;
- City logistic;
- Traffic network modelling/Traffic engineering;
- Planning Walking and Cycling;
- Parking planning in urban area;
- Public Transport Planning & Management;
- Location methods in Transport;
- Transport Geography;
- Urban economy;
- Project management;
- Intelligent Transport Systems;
- Transport vehicles;
- Models and Sources of Funds for Transport Infra and Suprastructures;
- (...)

The full list of optional modules shall reflect the state-of-the-art and the set of competences on the Sustainable Mobility theme to be developed.

It is also important to endure the modularity of the study program with horizontally associated programs. The module structure needs to allow individual modules to be delivered in such a way (part time, short intensive residential, distance learning, mix of these modes of attendance) that they become attractive not only for conventional full time students but also for professionals already working in transport planning and engineering who want to improve or update their skills. So instead of taking the whole program, they take one or two modules and get ECTS credits for them.

The full list of modules needs to reflect the multidisciplinary nature of the course envisaged, which aims to create new competences in a particular market. The target market of the course shall be clarified with clear goals for the short and medium terms. If courses are taught in English, the market potential will be much higher. The collaboration of international experts such as those from CIVITAS DYN@MO are important.

**While preparing the curriculum, it is necessary to use the patterns of the Agency for Science and Higher Education Croatia.**

### 3.4. Coverage of the curriculum

It is mandatory to process the elements of the Elaborate of the study program (from chapter 4.8. Summary of Elaborate on the study program) and the following chapters:

#### 3.4.1. General information on the Study Program

1. Name of the study program and the academic or professional title acquired when completing the study program
2. Carrier/contractor of the study
3. Type of study program
4. Level of study program
5. Scientific or artistic area
6. Scientific or artistic field
7. Scientific or artistic branch
8. Terms of enrollment on the study
9. Duration of study
10. Total number of ECTS credits
11. The academic title awarded upon completion of studies
12. Documents of accredited undergraduate professional or university study<sup>4</sup>

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<sup>4</sup> Provided by University North

13. Compliance Analysis of the study program with the strategic objectives of University North<sup>5</sup>

14. Achieved competences upon completion of study program and work qualifications

- the intended learning outcomes which are acquired by completing individual study program obligations, study modules and total study program

15. The mechanism for ensuring the vertical mobility of students in national and International area of Higher Education

16. The correlation of the proposed university study program with basic modern skills and professions

17. The correlation of proposed university study program with the needs of the local community

- to determine the real needs of the region by analyzing the needs of the labor market (according to the recommendation of the education enrollment policy and scholarship policy CES),
- compliance with economic, socio-economic and cultural priorities of the Republic of Croatia and with state and county development strategy
- to determine the interest, and the field studies at the level of Croatia and regional level (in summer enrollment period )

18. Analysis of employability of students after the completion of the study program

- which must include the opinion of three organizations related to the labor market (for example: professional associations, employers and their associations, trade unions, public services) appropriateness of intended learning outcomes that are acquired after completion of the study for the market labor needs.

19. Analysis and comparison of the proposed university study program with foreign accredited programs of reputable institutions of higher education (and their quality) in particular accredited studies from Republic of Croatia and EU countries<sup>6</sup>

- It is necessary to analyze and present a brief review of existing curriculum of clean urban mobility in other selected EU members (to identify examples of best practices and analyze their strengths and weaknesses )

20. Previous experience of the contractor in the performance of the same or similar university study programs

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<sup>5</sup> Strategic document of University North, Chapter 3.6

<sup>6</sup> Considering the CIVITAS DIN@MO project, it is necessary to initiate cooperation with partner universities in Edinburgh, Ljubljana, Zagreb and the regional subsidiary of Veszprem University in Nagjkanisza, Hungary.

21. Partners outside the high education system that participate in the implementation of the proposed study program

- analyze the possibility of the implementation of the program with other institutions (economy, public sector, etc.)

22. International cooperation of higher education institutions

### **3.4.2 Description of the program**

1. List of compulsory and elective subjects with the number of lessons required for their executions and ECTS credits
  - each study program course should be assigned the appropriate number of ECTS credits, which measures the total work that the student must do in order to acquire the intended learning outcomes as part of that commitment
2. Description of required and elective courses
  - teaching methods and content of the study program, which provides acquisition intended learning outcomes
  - The structure of the study program, the pace of study, student enrolment conditions in the next semester, enrolment conditions for particular courses
3. The list of courses that students can take from the other study programs
4. The list of courses that can be taught in a foreign language (English)
5. Completion of studies
  - it is additionally necessary to analyze the financial viability of the study in order to estimate the total potential cost of implementation of the study program and to structure and submit a study program that will be eligible for funding from the government budget

### **3.5. Operability within the Croatian system (particular University North)**

The proposal for the study program on “Sustainable mobility” should be written in accordance with the legislation of the Republic of Croatia and with strategic documents of the University North.

During the preparation of the program, realistic possibilities of the implementation of the suggested activities need to be taken into account, especially regarding the staff structure of University North and spatial possibilities of the campus.

The task is aimed at proposing a study program which would be co-financed by the Ministry of Science, Education and Sport of Croatia. Also, it is necessary to assess a required number of students as well as the tuition fees which would cover the costs of the program.

### **3.6. Prerequisites for admission of students**

The proposal must be analyzed and a horizontal and vertical mobility of students of similar studies in the EU, and especially of technical and social studies in Croatia, must be

enabled. The prerequisites for admission to a university graduate study program shall be based on international criteria and the nature of the students' market to cover (regional and all European).

The prerequisite for admission to graduate study program of "Sustainable mobility" is a completed undergraduate university study program in engineering or social sciences (economy field).

It is therefore necessary to carry out an analysis of similar study programs in EU with clearly defined positive and negative sides of each program as well as analysis of all study programs in Croatia dealing with traffic and transport technology. In addition, it is necessary to make an analysis of existing undergraduate study programs in the area of engineering sciences at the University North, especially professional undergraduate study of Technical and Economic Logistics, and propose any necessary measures in order to achieve higher quality program with graduate university study program of "Sustainable mobility". The existing undergraduate professional<sup>7</sup> study, "Technical and Economic Logistics" is a three years study program and upon its completion 180 ECTS credits and the academic title of a Bachelor Engineer of Technical and Economic Logistics (bacc.ing.logist.) is acquired.

In accordance with the Development Strategy of the University North existing professional undergraduate study will be reshaped into the university study program and will present a one of the vertical basis for the continuation of study in a new two-year university study program "Sustainable mobility", in the area of Technical Sciences, field: Traffic Technology and Transport.

Also, it is necessary to assess the possible corrections to a graduate study program of Business Economics at University North as well as possible horizontal modules within the framework of the study program.

### 3.7. Timescale of activities for the execution of the contract

No.	Activity	Weeks
1.	Analysis of legislative framework of Croatia and strategic documents of University North (especially regarding staff and spatial capacities)	1
2.	Analysis of compatibility of the study program with strategic goals of the university and national sector strategy	1
3.	Analysis of study programs in the field of traffic and transport planning in Croatia	1
4.	Analysis of similar study programs EU	2
5.	Identification of best practice and gap analysis	4
6.	Assessment of the relevance of the study program regarding the labor market needs, in public and private sector.	6

<sup>7</sup> The plan is to transform the current year study of "technical and economic logistics" on university.

No.	Activity	Weeks
7.	Analysis of minimal institution preconditions for comparability of the proposed study program with the quality of similar accredited study programs in the countries of the EU.	6
8.	Clarify the target market of the course with clear goals for the short and medium terms.	6
9.	Overview of knowledge a student shall acquire upon finishing the program	6
10.	Examine the overall potential of the University North as well as the North-Western Croatia and analyze the needs and optimal models of structuring the program	6
11.	Suggest partners outside the higher education system (economy, public sector, etc.) which would participate in the implementation of the proposed study program.	6
12.	Suggest obligatory and optional subjects	7
13.	Develop obligatory and optional subjects (proposal of class type/teaching methods must be developed separately for full time and part time students in accordance with the characteristics of the mentioned study programs)	11
14.	Suggest a list of subjects which may be chosen by students from other study programs (University North, other universities in Croatia and EU).	11
15.	Suggestion of courses conducted in English and a suggestion of foreign carriers of those courses	11
16.	Suggestion of courses which could be taken and passed through e-learning, short courses, occasional educational courses and attractive courses for employed professional wanting to improve their knowledge (instead of taking the whole program, they take one or two modules and get ECTS credits for them).	11
17.	Conditions for admission to the study program and subsequent semesters	
18.	Learning outcomes acquired by fulfilling individual study program obligations, study program modules and total	12
19.	Analysis of labor market regarding the need for professionals and the employability analysis of students upon finishing the program which include an opinion of at least three organizations connected to the labor market (for example: professional associations, employers, public service companies, unions etc.) on the relevance of the learning outcomes acquired upon finished study program for the labor market needs.	12

No.	Activity	Weeks
20.	Development of a feasibility study on the foundation and implementation of the study program in accordance with legislative framework and the strategic document of the public scientific organizations network. <sup>8</sup>	14
21.	Mechanisms of assuring the horizontal program integration, that is students' mobility (analysis of possible cooperation of universities offering similar study program in Croatia and EU, as well as defining conditions for assuring it) – at least three universities.	12
22.	Mechanisms of assuring the vertical program integration, that is, students' mobility (defining clear preconditions that need to be fulfilled in order to participate in the study program – with a special emphasis on the possibility of including students of undergraduate technical and business studies in the countries in the region, Croatia, and especially University North)	12
23.	Explain the connection between the proposed university study program and basic and contemporary skills and profession	13
24.	Explain the connection between the proposed university study program and the needs of the local community (economy, entrepreneurship civil society, etc.)	13
25.	Ways of finishing the study program	13
26.	Framework of the curriculum	14
27.	Study program expense estimation per student	14
28.	Presentation of the program to the project team	14
29.	Acceptance/Correction of the program	15

### 3.8. Monitoring and evaluation

The proposer is obligated to hold monthly consulting meetings with representatives of the City of Koprivnica and, in accordance with suggestions of the client, make corrections to the materials.

In order to complete each stage of the development of the curriculum, pursuant to the provisions of the CIVITAS DYN@MO project (especially those stated in Article 3.7. Timescale of activities), the client's approval needs to be obtained. What needs to be particularly presented is all points/paragraphs defined in Article 3.4. The Coverage of the curriculum, and for each the client's approval needs to be obtained. The stages of the development of the curriculum which are logically conditioned need to be approved in advance by the client in order to move on to the next stage, continuing until the final completion of the proposal of the curriculum for the study program.

<sup>8</sup> in accordance with national regulations (Agency for Science and Higher Education)

The evaluation of the proposal of the study program must be completed by the project team of the CIVITAS DYN@MO project and at least three independent institutions. In addition, a statement of the Croatian Chamber of Traffic and Transport Engineers, Croatian Employment Service, at least one transport/logistics company and one unit of local government, must be obtained. A special emphasis must be given to the needs of the labor market and the employability of future professionals who will finish the study program. The proposer must correct the proposal of the study program in accordance with the suggestions of the evaluators.

## 4. ATTACHMENTS

### 4.1. Introduction about the higher education system in Croatia<sup>9</sup>

Higher education in the Republic of Croatia is conducted through university and professional study programs. University programs prepare students for performing work in science and higher education, business, public sector and society in general and also prepares them for the development and application of scientific and professional achievements. Professional study provides students appropriate level of knowledge and skills to perform professional activities and qualify them for immediate employment process.

University study programs includes three levels: undergraduate, graduate and postgraduate studies.

Undergraduate university study program normally lasts for three to four years and after its completion, students are awarded 180 to 240 ECTS credits. Upon completion, the academic title of university bachelor, with the professional indication, is awarded.

Graduate university study normally lasts for one to two years and after its completion, students are awarded 60 to 120 ECTS credits. Upon completion of undergraduate and graduate university study students are awarded at least 300 ECTS credits, and the title of Master of profession.

Postgraduate university study lasts for at least three years and its completion awards generally 180 ECTS credits and the academic degree of doctor of science. Postgraduate study programs last for one to two years and upon their completion students acquire an academic title of a specialist of a certain profession.

Professional study includes the following levels: short professional study, undergraduate professional study and specialist graduate professional study.

Short professional study lasts up to two to two and half years and with upon its completion students acquire 120 to 150 ECTS credits and the professional title bachelor of a certain profession.

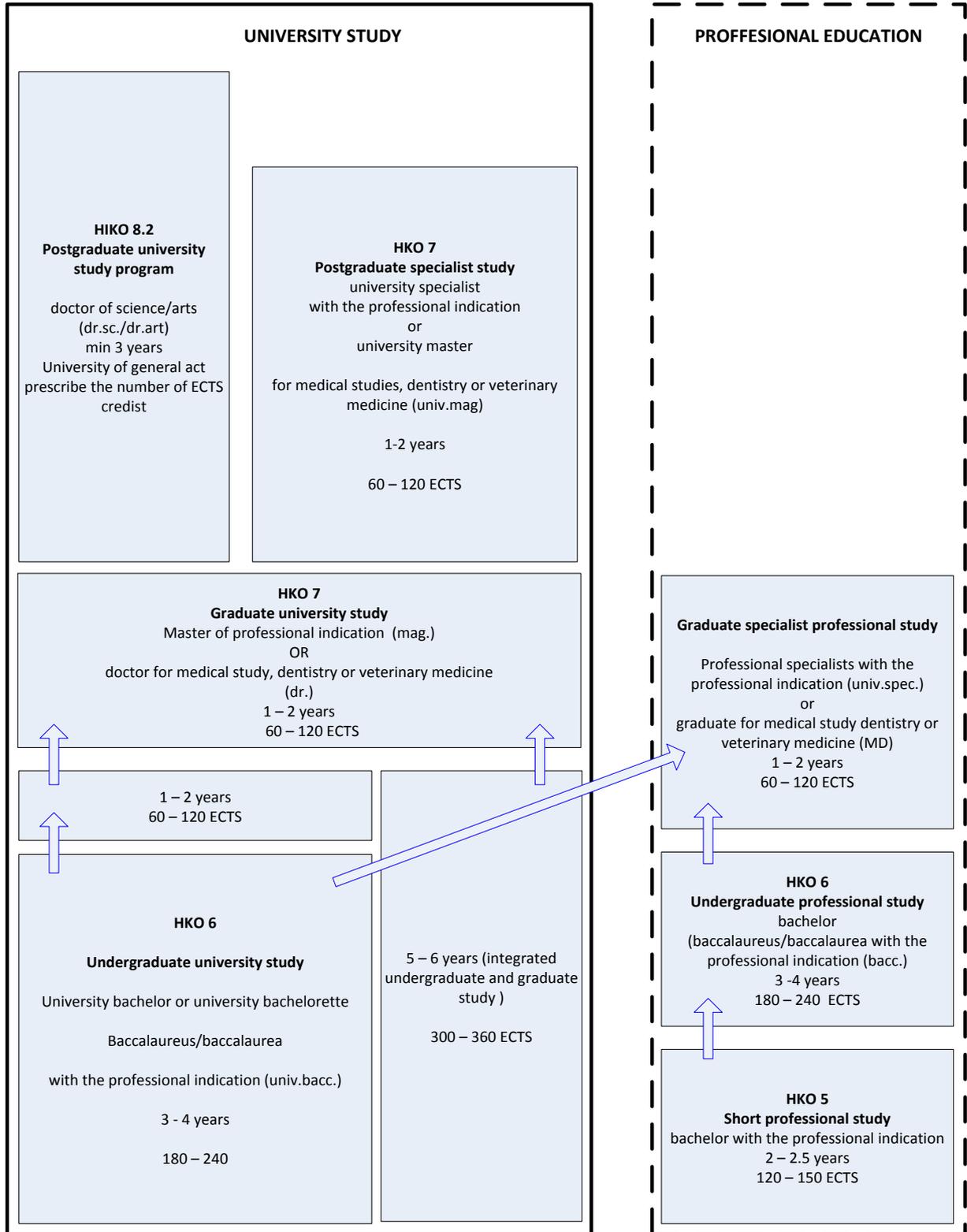
Undergraduate professional study lasts for three (exceptionally four) years and upon its completion students acquire 180 to 240 ECTS credits and a professional title of a bachelor of a certain profession.

Specialist graduate professional study last one to two years, and upon its completion, students acquire 60 to 120 ECTS credits and a professional title specialist with the professional indication.

The total number of credits earned in undergraduate and specialist graduate professional study programs is at least 300 ECTS credits.

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<sup>9</sup> Source: Agency for Science and Higher Education website



#### 4.2. Procedure and criteria for issuing the opinion of Croatian Agency of Science and Higher Education on the justification of public financing study programs at public universities

Law on Science and Higher Education, defines ways and conditions for Study programs (Article 78) and implementation plan (Article 79).

Based on the Quality Insurance Act for Science and Higher Education (OG 45/09)<sup>10</sup> Article 20, Paragraph 10, it is set that **university study programs are established and implemented by University senate decision, based on prior evaluation of the internal insurance and quality advancement department which takes into consideration the conditions prescribed by the Ordinance on the Content of License and Conditions for Issuing License for Performing Higher Education Activity, carrying out a study Program and Re-accreditation of Higher Education Institutions (OG 24/10)**. The same paragraph states that the university study programs can be financed by state funds based on contract with the Ministry and with previous approval of Higher Education and Science Agency.

The opinion of the Agency refers only to justifying the financing, considering that public universities according by law are obligated to check the minimum conditions determined by Ordinance on the Content of License and Conditions for Issuing License for Performing Higher Education Activity, carrying out a study Program and Re-accreditation of Higher Education Institutions (OG 24/10). The opinion on validity is made based on compatibility with strategic document of higher education institutions network, which states the criteria for setting up universities and study programs. It was adopted by the Croatian Parliament upon the suggestion of the National Council for higher education.

#### 4.3. Ordinance on the Content of License and Conditions for Issuing License for Performing Higher Education Activity, carrying out a study Program and Re-accreditation of Higher Education Institutions (OG 24/10)

The Ordinance states:

##### Article 12

1) University shall bring a decision on the delivery of a university study program that meets the following criteria:

1 documentation on a study program that includes a feasibility study on whether a study program is in line with the strategic document by the network of higher education institutions, drafted with the participation of teachers from the higher education system appointed into scientific-teaching and artistic-teaching grades in scientific or artistic field of study in which a study program shall be delivered;

2 proof of adequate space and equipment;

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<sup>10</sup> Conditions of applying for the introduction of a new study program for private universities, colleges and polytechnics have been established (Article 20)

3 proof of adequate number of signed work contracts with scientific-teaching and/or artistic-teaching staff;

4 statement by the university providing a university study program (independently) or agreement between universities jointly delivering a university study program as a proof that funds have been secured for the delivery of a study program.

(2) Decision and documentation from paragraph 1 of this Article the university shall submit to the Agency and the ministry competent for higher education that shall, on the basis of that decision, enlist a study program to the suitable register of study program.

(3) After the issuing of the confirmation on enlisting to the register from the previous paragraph, conditions for the beginning of the delivery of a university study program are being met.

(4) On the basis of the previous assessment of the unit for internal system of quality assurance and enhancement that takes into consideration conditions provided by this Ordinance, University shall issue a decision from paragraph 1 of this Article.

(5) University study program may be funded from the state budget upon fulfilment of preconditions in accordance with the provisions of Article 20, paragraph 10 of the Act on Quality Assurance in Science and Higher Education.

#### Article 13

(1) Report on the university study program from Article 12, paragraph 1, item 1 of this Ordinance must contain:

1 name of a study program, and academic or professional title awarded upon completion of studies;

2 analysis on whether a study program is in compliance with the university strategic aims;

3 expected learning outcomes acquired by carrying out particular study obligations, study modules, and an entire study program.

4 teaching methods and study program content that ensure acquisition of expected learning outcomes;

5 every student is awarded certain number of ECTS points for each learning achievement; ECTS points are based on overall workload expected from a student in order to acquire expected learning outcomes for that learning achievement;

6 document on accredited undergraduate study program in the same scientific or artistic field for graduate study, or, in case of interdisciplinary studies, document on accredited undergraduate studies in all fields of a given interdisciplinary study program;

7 license for accredited graduate or integrated undergraduate and graduate study program in the same scientific or artistic field for postgraduate specialist study, or, in cases of interdisciplinary studies, license for accredited graduate or integrated undergraduate and graduate study program in all fields of the given interdisciplinary study program;

8 for postgraduate university study license for accredited graduate or integrated undergraduate and graduate study program from the same scientific or artistic field or, in cases of interdisciplinary studies, license for accredited graduate or integrated undergraduate and graduate study programs in all fields of the given interdisciplinary study program;

9 comparability study of the proposed study program with the quality of related study programs in Croatia and the EU countries with the analysis of minimum institutional preconditions from Articles 18 and 19 of this Ordinance;

10 institutional mechanisms for ensuring vertical mobility of the students of all study levels within the national and international higher education areas;

11 employability study upon the completion of a study program, including the opinion of three organizations connected with the labor market on adequacy of learning outcomes acquired upon the completion of studies (such as professional associations, employers and their associations, unions, public services);

12 proof on securing adequate space, equipment and other facilities necessary for the delivery of a study program in accordance with Article 5 of this Ordinance.

(2) At least one half of overall number of working hours of a proposed study program must be carried out by full-time employee appointed into scientific-teaching and/or artistic-teaching grades.

## VI COMPLIANCE OF PROPOSED STUDY PROGRAMMES WITH ACCREDITED PROGRAMMES IN THE EU COUNTRIES

### Article 18

(1) In order to ensure compliance of proposed study programs with related accredited programs in the EU countries, higher education institutions should comply with the following minimum institutional criteria:

1 bring general strategy of development of a higher education institution and separate strategies or action plans; publish annual reports on their implementation;

2 define and publish its standards and regulations regarding the assessment of acquired learning outcomes (examination procedures) of all studies conducted by a higher education institution, including testing methods, quality assurance, impartiality, transparency, appeal procedures, and other relevant issues;

3 ensure participation of students in all quality processes of a higher education institution;

4 ensure participation of representatives from labor market in the development of a higher education institution;

5 establish information technology system collecting, managing and processing data on the organization of higher education institutions and organization and conducting of study program, as well as information on quality assurance.

6 define and publish its standards and regulations concerning periodic review of programs that includes participation of external experts;

7 define and publish its standards and regulations concerning student rights, particularly concerning informing students, collecting and dealing with student pleas, procedures for protection of student rights (e.g., vice-dean for teaching, student ombudsperson, student affairs office, etc.)

8 define and publish its standards and regulations concerning continuing education of its employees in their fields of expertise and publish on regular basis on its implementation;

9 ensure quality of higher education institution professional services and publish regularly on their activities.

#### Article 19

(1) Study programs in the fields of regulated professions for which automatic recognition of professional qualifications is provided by the Directive 2005/36/EC of the European Parliament and Council of 7 September 2005 on the Recognition of Professional Qualifications (Hereinafter: the Directive), must be in compliance<sup>11</sup> with minimum training requirements regulated by the Directive and Act on Regulated Professions and Recognition of Foreign Professional Qualifications.

(2) Compliance of study programs from paragraph 1 of this Article with the Directive and the Act on Regulated Professions and Recognition of Foreign Professional Qualifications set out by the ministry competent for higher education.

(3) Study programs from paragraph 1 of this Article that shall not receive positive opinion of the ministry from paragraph 2 of this Article are not comparable to accredited study programs in the EU countries.

(4) Study programs from paragraph 1 of this Article that have not been aligned with the Directive and the Act on Regulated Professions and Recognition of Foreign Professional Qualifications shall not be funded from the state budget.

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<sup>11</sup> fields of technical sciences, traffic and transport technology is not defined as a field with automatic professional qualification recognition

## VII CONTENT OF LICENSE

### Article 20

Accreditation license shall contain the following information:

1. name and the address of a higher education institution being established, or name and address of the higher education proposing a study program, and higher education institution delivering study program;
2. name and type of study program;
3. initial date of beginning of the study program (academic year);
4. duration of study in years;
5. number of ECTS points awarded upon completion of studies;
6. place of delivery of study program (centralized or de-centralized);
7. academic or professional title, or academic degree, awarded upon completion of studies;
8. optimum number of students stated in the submitted report on establishing higher education institution or delivering a study program.

#### 4.4. Networks of higher education institutions and study programs in Croatia

The National Science Council has adopted the network of higher education institutions and study programs in Croatia<sup>12</sup> (from November 27, 2011) which introduced the proposal of networks of study programs (with strategic goals and priorities in each county) and the proposal for education policy and the policy of scholarships as follows:

##### Koprivničko-križevačka County

County/city	Educational programs which should increase the number of registered and funded students.		Educational programs which should reduce the number of registered and funded students	
	Professional study	University study	Professional study	University study
Area VI: Koprivničko-križevačka county	Nursing *	Teacher education *	Economy *	Economy
		Croatian language and literature *		
		Medicine *		
		Pharmacy *		
		Music art *		
		Mechanical engineering *		
		Civil engineering *		
		Mathematics *		
Physics *				

Programs that are implemented in the areas of local labor market \*

<sup>12</sup> Before University North was founded

### Varaždin County

County/city	Educational programs which should increase the number of registered and funded students.		Educational programs which should reduce the number of registered and funded students	
	Professional study	University study	Professional study	University study
Area V: Varaždin County	Production engineering *	Mechanical Engineering*	Economy	
		Electrical Engineering*		
	Electrical Engineering*	Architecture *		
		Civil Engineering *		
	Civil Engineering *	Medicine *		
		Mathematics *		
		Psychology *		
	Pre-school Education *	Pharmacy *		
		English Language *		
		German Language *		

Programs that are implemented in the areas of local labor market (\*)

Based on the adopted Networks of higher education in Croatia, the guidelines and criteria for the establishment of new study programs at existing institutions of higher education have been adopted (Chapter 3.1.)

The new study program proposed by the existing institution of higher education shall be assessed by series of criteria. For each criteria “i” grade “O<sub>i</sub>” is calculated. Not all criteria are equally important, however, each criterion is assigned weight “T<sub>i</sub>”. Final grade “K” for the study program is calculated by adding the individual scores together and multiplying them with the corresponding weight criterion. If the grade is less than 0, it will be entered in the total sum as 0, and if it is greater than 1, the total sum will be 1.

$$K = \sum_{i=1}^n \max(\min(O_i, 1), 0)$$

Considering the fact that the weights are placed so that the sum of the weights is 1, the above equation ensures that the minimum possible grade is 0 and the maximum possible grade 1. Study programs where those that receive an overall assessment “K” greater than or equal to limit value as determined by The National Council for Higher Education no later than thirty days from the date of adoption of the strategic document network.

If for some criteria “i” set the lower limit of “D<sub>i</sub>” which must be met by a study program in order to be accepted, and the study program is rated lower from the lower limit, it will not be accepted, regardless of the total score.

Criteria that are evaluated are especially defined as are methods of assessing them, and they are as follows:

- I. Teachers' workload
- II. The ratio of teachers and students
- III. Coverage of teaching from own staff
- IV. Space per student
- V. The labor market needs (according to the recommendations concerning education enrollment policy and politics scholarship of the Croatian Employment Service).
- VI. Interest in field studies at the national level (summer enrollment period)
- VII. Interest in the field of studies at the regional level (summer enrollment period)
- VIII. Number of students enrolled in summer enrollment period
- IX. Compatibility with existing study programs
- X. Study program is carried out in the area of the special state concern
- XI. Compliance with economic, social and social-cultural priorities of the RH
- XII. Compliance with state and county development strategy
- XIII. The initial cost covered out of the state budget
- XIV. The cost covered by the state budget at the end of an academic year
- XV. Execution of the program in the collaboration with other institutions
- XVI. The ratio of the number of students and the number of students completing high school in the region

#### **4.5. Croatian qualification framework**

Croatian qualification framework is an instrument of reform which regulates the whole system of qualifications at all levels of education in the Republic of Croatia through qualification standards based on learning outcomes and aligned with the needs of the labor market, individual needs and needs of the whole society.

Croatian qualifications framework (CROQF) is the framework in which each of qualifications acquired in Croatia has its place. At the center of the CQF are learning outcomes - i.e., the competencies that a person has acquired through learning and demonstrated after the learning process, in which the procedure of learning is not key because the learning outcomes are tested. Any qualification acquired in Croatia is determined according to the level of learning outcomes that belong to this qualification.

Placement of qualifications at a specific level allows qualifications to be compared and linked.

In addition to the relationship between qualifications obtained in Croatia, setting qualifications to a certain level of CROQF provides referencing levels of qualifications acquired in the Republic of Croatia to the levels of the European Qualifications Framework (EQF) and the qualifications framework European Higher Education Area (QF-EHEA), which enables recognition of qualifications acquired in the Republic of Croatia in Croatian and European labor market.

As they are at the center of CROQF learning outcomes, and not the procedure that led to these outcomes, CROQF provides a foundation for developing the evaluation of prior learning (EPL) and gives the basis for the identification and evaluation of outcomes of non-formal and informal learning, with mandatory introduction of quality assurance systems and clearly defined procedures to verify quality.

CROQF introduces standards of qualifications. While it is possible to acquire the same qualification in different educational facilities, through different educational programs, there are certain standards about learning which qualifications need to have. Educational programs need to be synchronized with standards of qualification which means they result in achieving certain outcomes, as is prescribed by adequate standards of qualification.

CROQF introduces standard of occupation too. That document clearly states all necessary competences for a certain job. The qualification standard is based on strict method and data which determine and analyze all competences for a particular profession.

Sectorial councils are advisory and highly competent bodies whose concern is human resources and needs on job market, in each sector. Details are available ([http://www.kvalifikacije.hr/sektorska\\_vijeća](http://www.kvalifikacije.hr/sektorska_vijeća))

Qualifications which can be acquired in Croatia are complemented by levels of CROQF as follows:

- Level 1: elementary education;
- Level 2: vocational training;
- Level 3: one year and two year secondary vocational education;
- Level 4.1: three-year vocational education;
- Level 4.2: grammar school secondary education; four and five years vocational secondary education;
- Level 5: Professional study program awarding less than 180 ECTS credits; vocational specialist education and training; programs for masters degrees with at least two years of evaluated work experience;
- Level 6: university undergraduate study; professional graduate studies;
- Level 7: university graduate study programs; specialist professional graduate study programs; postgraduate specialist study programs;
- Level 8.1: postgraduate science master's degree studies;

- Level 8.2. Postgraduate university (doctorate) study programs, defending doctoral dissertation separate for the university.

CROQF Registry Ordinance is used by the minister of education and science with the agreement of ministers in charge of regional development and ministers for economy, entrepreneurship and trade in order to establish names of sectorial councils, names of sectors, criteria to elect members of sectorial councils and description of responsibilities and duties of sectorial councils.

It defines the structure of 25 sectorial councils and one of them is XI Traffic and logistics (founded in order to regulate technology of traffic, transport and sectorial council XVI Technical science (for basic technical sciences and environment engineering).

#### **4.6. Strategic documents of University North**

In order to have complete insight for introducing a new study program at University North, here are strategic documents of the University.

##### **4.6.1 Statute of University North**

The excerpt of the document stipulates the establishment of new study programs.

#### **IX Study programs and classes**

Types of study programs

Article 145

Higher education at the University is established through university and professional studies.

Article 146

There are four levels of university education:

- 1) Undergraduate (university or professional) study program
- 2) Graduate (university or professional) study program
- 3) Postgraduate specialist study program
- 4) Postgraduate scientific – doctoral study program

Graduate and postgraduate study programs can be performed in collaboration with scientific institutes, Each level ends with the acquisition of a certain title or degree. Certain study programs, which are approved by accreditation council of Agency for Science and High Education, is integrated through the first and second level of study programs. Every level of study program from Paragraph 1 of this Article must be coordinated with European Credit Transfer System (ECTS) which stipulates that one year is equal to 60 ECTS credits.

#### Article 147

ECTS credits can be transferred between different study programs. Criteria and conditions for transferring the credits are determined by Ordinance on transferring or a contract between University and other higher education institutions.

#### Article 148

Postgraduate university study programs are usually constituted with obligatory and elective subjects, based on credits, as is the case for doctorate study programs. All the regulations of undergraduate, graduate and postgraduate programs are made by Senate.

#### Article 149

It is possible to form and do various forms of additional education, which is decided by the Senate.

### ORGANIZATION STRUCTURE AND IMPLEMENTATION OF THE STUDY PROGRAMS

#### Article 150

University organizes and conducts university and professional study programs in Centers, departments or university institutes and in collaboration with other higher education institutions by the decision of the Senate in accordance with this Statute.

#### Article 151

Part of university studies implementation may be entrusted to university institutes or research institutes outside the University, in situations:

- 1) that the holder of the study has no equipment for carrying out the curriculum,
- 2) that it significantly enhances the learning process.

In the study from Paragraph 1 of this Article, students may enroll at the University where they attend most of the classes according to the curriculum of the study program.

The method and conditions for implementation of this study programs are regulated by a contract between the University and the study contractor with a prior approval of the Senate.

### CONDITIONS FOR ADMISSION TO STUDY

#### Article 152

University undergraduate study programs admit persons with a four-year secondary school degree.

Professional study may enroll a person with a four-year secondary school degree.

Department regulations determine the approved type of high school and the conditions for candidates who have completed a different type of school than prescribed.

#### Article 153

Postgraduate university study can be enrolled by people who have completed a relevant university study program (for a period of 5 years, in order to acquire 300 ECTS).

**Graduate university study may be enrolled by a person who has completed a relevant university undergraduate or professional undergraduate study program (by passing supplementary courses valued at a minimum of 15 to a maximum of 30 ECTS), for a period of three years (180 ECTS).**

Graduate professional study may be enrolled by a person who has completed a relevant university undergraduate or professional undergraduate study lasting three years (180 ECTS).

The study program determines which undergraduate university study program is considered appropriate for admission and conditions regard to success at the undergraduate level.

#### DURATION OF STUDY

#### Article 154

The duration of each study is determined based on the complexity of the program and the time required for mastering it.

University undergraduate study lasts for three years, and awards 180 ECTS credits. The completion of undergraduate study programs allows students to acquire the academic title of Bachelor (baccalaureus or baccalaurea) with profession indication.

Professional Undergraduate study programs last three years and awards 180 ECTS credits. The completion of professional study with 180 or more ECTS credits allows students to acquire the academic title of Bachelor (baccalaureus or baccalaurea) with profession indication.

Graduate study programs last two years and their completion awards 120 ECTS. The total number of credits earned at undergraduate and graduate study is at least 300.

The completion of graduate university studies, awards the academic title: Master (MSc.) of Professional Studies.

#### Article 155

Postgraduate university study programs last for three years (180 ECTS). Fulfillment of prescribed conditions and a public defense of the dissertation, awards the academic degree of Doctor of Science (PhD).

For a person who has acquired the title of a master of science, the study program for the academic degree of Doctor of Science from the same scientific field will last at least a year.

#### Article 156

The student may re-enroll the same year only once.

The right of students who re-enrolled the same year of study, as well as the right to enroll subjects of higher years of study, will be defined by the department.

Excellent students may be approved by the Senate to complete the study in a time shorter than the prescribed duration of study.

The scope and manner of exercising the right to an accelerated program shall be defined by the department regulations.

### **STRUCTURE AND METHODOLOGY OF STUDY**

#### Article 157

Lessons at the University is organized by academic years.

Notwithstanding the provisions of the preceding paragraph of this Article, lessons at graduate and postgraduate studies may also be organized by semester.

#### Article 158

Undergraduate, graduate and postgraduate study programs are organized and performed as a full-time or part-time programs, in accordance with the program and its curriculum.

In determining the curriculum, the University shall ensure the study program is:

- 1) contemporary and appropriate to abilities and interests of the registered students and the needs of employers,
- 2) comparable to similar programs at universities in developed countries.

### **CURRICULUM**

#### Article 159

The study programs are organized according to the curriculum.

Curriculums that are carried out at the University are made by the Senate in accordance with the Law.

When determining the curriculum, the study program must be:

- 1) at the level of latest scientific or artistic knowledge and skills,
- 2) aligned with national priorities and needs of the professional sector,
- 3) comparable to the programs in the European Union countries.

Curriculum shall be made in accordance with the Statute and other general acts of the University, and includes:

- 1) professional or academic title or degree acquired with graduation,
- 2) the terms of enrollment,
- 3) comprehensive content of compulsory and elective subjects and the number of hours needed for their implementation,
- 4) the credit value of each subject determined in accordance with ECTS,

- 5) forms of teaching and methods of assessment for each subject,
- 6) the list of subjects that students may select from other university or professional studies,
- 7) the conditions for registration of students for the next semester or next year of study and preconditions for enrollment on particular subjects or group of subjects,
- 8) conditions for the completion of the Study program,
- 9) provisions on whether and under what conditions students who discontinue the study or lost the right to study, continue their studies.

#### Article 160

Study programs shall be conducted according to the curriculum adopted by the Senate on the proposal of the departments Expert Council. Syllabus shall determine:

- 1) Teachers and associates who will conduct lessons according to the curriculum,
- 2) The venue,
- 3) The beginning and end of academic year timetable,
- 4) forms of teaching (lectures, seminars, consultations, examinations, etc.),
- 5) exams,
- 6) examination periods,
- 7) list of literature for study and examination,
- 8) teaching in a foreign language,
- 9) other requirements for regular teaching.

Studies may be organized through the system of distance learning in accordance with the Law.

#### Article 161

Regulation on studying, as a general act of the University, more precisely regulates issues of enrollment, organization of study programs, performance of programs, student status, rights and obligations of students, the termination of student status and other.

Regulation on studying is published so that it is available to the public, particularly to students and applicants applying for the student status.

#### Article 162

University can take away an academic or professional title and academic degree if it is determined that the obtained is contrary to the prescribed conditions for its acquisition, seriously violates the rules of study or on the basis of a doctoral thesis (dissertation), which is plagiarized or falsified.

The process from the previous Article shall be implemented in accordance with the law and regulations of the University.

### **4.6.2 Development strategy of the University North**

Below is an excerpt from the Development strategy of the University North in the part related to the establishment of new study programs.

When establishing new study programs, the University will especially ensure that the study is:

- at the level of the new scientific findings and skills based on them
- aligned with the strategic document network of higher education institutions
- aligned with national priorities and needs of the professional sector
- comparable with the programs in the European Union countries

Study programs (new) will be made in accordance with the law, statute and other general regulations of the university, and include:

- Professional or academic title or degree awarded upon the completion of studies
- The academic requirements for enrolling in the study program, the conditions for admission of students to the next semester or trimester, next academic year, and admission preconditions for study obligations
- The intended learning outcomes which are acquired by completing individual study obligations, study modules and the overall curriculum, as well as the planned number of hours for each subject, in order to ensure the acquiring of that learning outcome
- For each study program, obligations the appropriate number of ECTS credits is assigned, based on average work that the student must do in order to gain the intended learning outcomes as part of that obligation.
- The form of teaching and examination of acquired learning outcomes for each subject
- A list of other programs of study from which they can gain ECTS credits.
- Completion of the studies and provisions on whether, and under what conditions, students who discontinue the study or lost the right to study can continue the study program.

ECTS credits should not be specified to post-graduate university studies in which their acquisition is not foreseen. In addition, it will take the active involvement of young scientists that need to be sent to study at the prestigious universities in Europe and world, and to motivate them to return home and work at the University by awarding them apartments. In **the Strategic Plan of the Ministry of Science, Education and Sports** for the period 2014-2016, the overall objective is to ensure and improve the quality and increase the availability, efficiency and relevance of the education system at all levels. The specific objective is to develop an effective network of educational institutions and qualification / programs / curriculums directed at developing human resources and aligned with the needs of society and the labor market, which can be measured by the increase in the proportion of highly educated persons in the population from 25 to 64 years of age. Indicators of this objective are to increase the number of study programs that are aligned with the needs of the labor market by integrating data on graduates and the data of the Croatian Employment Service.

Starting a new two-year university graduate study program is in accordance with the strategic objectives of the University North, 8.1 teaching process, 8.1.1. Teaching process- Curriculums, program contracts, e-learning, LLL.

Strategic Objective 5. Development of new study programs at the graduate level (vertical on existing undergraduate programs of the University)

Goal/Measure	Jurisdiction/Implementation	Implementation indicators (KPI)	Deadline
1. Independently or in cooperation with higher education institutions provide a sufficient number of teachers (the progress of the staff and / or employment of new staff) to acquire human resources for the performance of university graduate or specialized study programs and to ensure the prescribed minimum level of offering required classes to full-time employees.	Rector Vice-rectors of university centers Vice-Rector for Academic and Student Affairs	Minimum of 3 new employees in the scientific and teaching full time (or equivalent cumulative employment)  Minimum 51% coverage of the teaching staff in the scientific and educational titles of the total number of standard hours for individual study programs	Journalism 2018. Media Design 2018 Multimedia 2017 Production Engineering 2018 Construction 2018 Nursing 2018 Electrical Engineering 2018 Sustainable mobility (Technical and Economic Logistics) 2018
2. At the departmental level (or in collaboration with other partner institutions of higher education) appoint working teams for developing the curriculums for university graduate or specialized study programs. At the level of council areas of science / art appoint reviewer teams.	Vice-rectors of university centers Heads of departments Council areas of science/arts	Number of teams  Number of appointed reviewers	2016

Goal/Measure	Jurisdiction/Implementation	Implementation indicators (KPI)	Deadline
<p>3. Develop new subject syllabus, establish learning outcomes and associated competences according to Bloom's taxonomy and create integrated curricula with the implementation plan of the university graduate or specialized programs.</p> <p>Identify the necessary resources for equipping the laboratory / venues for the performance of new university and specialized graduate study programs, either independently or in cooperation with partner institutions of higher education.</p>	<p>Heads of departments</p> <p>Council areas of science/arts</p>	<p>Number of new Syllabus adopted by some Council areas</p>	<p>Journalism 2017 Media Design 2017 Multimedia 2017 Packaging 2016 Production Engineering 2017 Construction in 2017 Nursing 2017 Electrical Engineering 2017 Technical and Economic Logistics 2017 (Sustainable Mobility)</p>
<p>4. In accordance with established needs to provide the necessary equipment for venues or laboratory.</p>	<p>Vice-rectors for Finance and Administration Department</p> <p>Vice-rectors of university centers</p> <p>Heads of departments</p>	<p>The number of new laboratories/worksite</p>	<p>2016 – 2019</p>
<p>5. Start implementing classes of the new university graduate or specialized study programs.</p>	<p>Vice-Rector for Academic and Student Affairs</p> <p>Vice-rectors of university centers</p>	<p>Number of adopted implementation study plans</p>	<p>Journalism 2018/2019 Media Design 2018/2019 Media 2017/2018 Packaging 2016/2017 Production Engineering 2018/2019 Construction 2018/2019 Nursing 2018/2019 Electrical Engineering 2018/2019 Sustainable mobility (Technical and Economic Logistics) 2017/2018</p>

Goal/Measure	Jurisdiction/Implementation	Implementation indicators (KPI)	Deadline
6. Raise the level of coverage of the lessons for full-time employees with the appropriate academic titles to the desired value.	Rector Vice-Rector for Academic and Student Affairs Heads of departments	More than 61%	2020/2021

#### 4.6.3 Regulations about studying at the University North

Below is an excerpt of the Regulations of Studies at the University of the North in the part related to the establishment of new study programs.

##### III. STUDY PROGRAMS OF UNIVERSITY NORTH

###### Article 3

The University North organizes and performs undergraduate university study programs, undergraduate professional study programs and graduate study programs in the Department of Journalism, Media Design Department, Department of Business and Management in the media, Department of Electrical Engineering, Department of Production Engineering, Multimedia Department, design and implementation, Technical and economic logistics Department, Department of Construction, Department of Nursing, Department of Communication Science, Public Relations and the Department of Business Economics.

###### Article 4

The duration of undergraduate university study programs, undergraduate professional study programs and university graduate study programs is determined by the curriculum.

##### VI. STRUCTURE AND METHODOLOGY OF STUDY

Curriculum, Syllabus

###### Article 28

Undergraduate university study programs, undergraduate professional study programs and university graduate study programs are organized and carried out as full-time and part-time, according to the study program and the syllabus.

###### Article 29

Curriculum includes:

- professional or academic title or degree acquired with graduation,
- the terms of enrollment,
- comprehensive content of compulsory and elective subjects and the number of hours needed for their implementation,
- the credit value of each subject determined in accordance with ECTS,
- forms of teaching and methods of assessment for each subject,
- the list of subjects that students may select from other university or professional studies,
- the conditions for registration of students for the next semester or next year of study and preconditions for enrollment on particular subjects or group of subjects,
- conditions for the completion of the Study program,
- provisions on whether and under what conditions students who discontinue the study or lost the right to study, continue their studies.

Syllabus determines:

- Teachers and associates who will conduct lessons according to the program, - the venue of teaching, - the beginning and end, academic year timetable, - enrollment quotas for department / group of subjects / courses on a particular study, - forms of teaching (lectures, seminars, consultations, testing etc.),
- conditions that a student must satisfy to obtain the signatures of teachers in their transcripts,
- conditions for the examination (completed another course, passed the examination of another course),
- exams,
- examination periods,
- list of literature for study and examination,
- possibility of teaching in a foreign language, and
- other requirements for regular performance of lessons

### **Adoption of the curriculum and syllabus**

#### Article 30

Curriculum and syllabus is made by the Senate.

The curriculum shall be published before the beginning of classes in the academic year, and available to the public.

The curriculum must be published on the official website of University. In justified cases, the curriculum may be published during the academic year.

#### Article 31

Curriculum is carried out by academic years.

The academic year starts on October 1st of the current, and ends on September 30<sup>th</sup> of next year.

The academic year is divided into two semesters, winter and summer.

Academic year calendar is determined for each academic year by the rector.

### **Establishing and performing classes**

#### Article 32

The way of organizing and performing classes is prescribed by the curriculum and syllabus, and it consists of lectures, seminars, exercises, consultations, mentoring, mid-term exams, practice, examinations and other forms of testing, professional practice and excursions.

Classes are organized in semesters.

Classes in full-time study program is carried out during 30 teaching weeks in the academic year.

Classes in part-time study program is carried out during one academic year.

Classes in part-time study program is carried out at the same time as classes in full-time study program or separately, depending on the syllabus.

### **Students load**

#### Article 33

The curriculum is determined by the number of hours of compulsory and elective subjects and the number of hours of professional practice.

Load of full-time student during the academic year is realized through 30 teaching weeks and 12 weeks must include the preparation for exams at regular examination periods.

Student enrolls 30 ECTS credits per semester.

All obligations of full-time students in classes are determined by the curriculum. For part-time students all obligations in classes amount to at least half of those established for full-time students.

#### Article 34

Full-time students must attend all types of classes stipulated by curriculum and syllabus.

If a full-time student is unjustifiably absent from class for more than 30% of lessons or exercises in a particular subject, it will be considered as not fulfilling their obligations, and the teacher can deny signature.

Class schedule is published at least seven days before the start of semester.

#### Article 35

Part-time students must attend classes and theoretical part of the teaching at least half of the commitments (50% established for full-time students).

Absenteeism from lectures does not relieve part-time students from other obligations of individual subjects (exercise programs, measurement, seminar work, etc.).

#### Article 36

Classes for subjects that are common for different programs are organized together. Curriculum is announced with the schedule of lectures for each program separately.

#### Article 37

For economy reasons and rationality, classes for full-time and part-time students are carried out together, when it is possible, regarding venue and other conditions.

#### Article 38

If, due to objective reasons, classes are not held, study leader will decide about the manner and time for additional lessons/classes.

### **Department heads**

#### Article 39

Department heads are responsible to the rector for study program performance. Each study program can have a department head. Study program supervisor is appointed by the rector.

### **4.7. Study programs at the University North**

University North is composed of eleven (11) departments (scientific and educational components) that run study programs. Of those, in the technical field of science (5 programs), social science field (4 programs), the biomedical field of science (1 program) and artistic field (1 program), as follows:

- Department of Electrical Engineering
- Department of Production Engineering
- Department of Multimedia, Design and Application
- Department of Construction
- **Department of Technical and Economic Logistics**
- Department of Biomedical Sciences
- Department of Journalism
- Department of Business and Media Management
- Department of Media Design

- Department of Communication and Public Relations
- Department of Business Economics

Within these academic constituent units of the University North the following programs are performed:

- Professional Undergraduate Studies of "Electrical Engineering" with two fields: "Automation" and "Biomedical Electronics"
- Professional Undergraduate Study of "Multimedia, Design and Application"
- Professional Undergraduate Study of "Production Engineering"
- Professional Undergraduate Study of "Construction" with two fields "Civil Engineering" and "Building Construction"
- Undergraduate Study "Nursing"
- **Professional Undergraduate Studies of "Technical and Economic Logistics"**
- Professional Undergraduate Studies of "Business and Media Management"
- Undergraduate university study "Journalism"
- Undergraduate university study "Media Design"
- **Graduate university study program "Business Economics" with two fields: "International Trade" and "Tourism"**
- Graduate university study program "Public Relations".

University North is mostly specializing in study programs for deficient STEM fields (Science, Technology, Engineering, Mathematics) and information and communication sciences with the share of these studies being 73% (8 of 11), and 86% according to the number of active students.

Starting a new two-year university graduate study program is in accordance with the strategic objectives of the University North.

Strategic Objective 5. Development of new study programs at the graduate level (vertical to the existing undergraduate programs of the University). Measure 3 of this objective is the obligation to create course syllabi, and to identify learning outcomes and associated competencies according to Bloom's taxonomy. Furthermore, it establishes the obligation to develop a comprehensive curriculum with a plan for the implementation of university graduate or specialized study programs. Also, it obligates to establish the necessary resources for laboratory equipment / sites for the performance of new university and specialist graduate study programs, either independently or in cooperation with partner institutions of higher education. The activities for the study of Technical and economic logistics are planned for 2017. It is planned to transform it into a university undergraduate study and open a new university graduate study program "Sustainable mobility" with the planned beginning of the study in the academic year 2017/2018.

#### 4.8. Summary of Elaborate on the study program

Based on the Law on Quality Assurance in Science and Higher Education (OG 45/09)<sup>13</sup> in Article 20.10 it is stipulated that study programs are established and implemented by the decision of the university senate on the basis of previous estimates of the unit for internal insurance and quality improving system, which takes into account the conditions laid down by the Ordinance on the content of license and conditions for issuing license for carrying out higher education activities, carrying out study programs and re-accreditation of higher education institutions (OG 24/10).

Pursuant to the Ordinance, the University will make a decision on the performance of the university study program for which there is:

1. **Elaborate on the study program** which includes a study on the justification of execution of the study program in accordance with the strategic document of network of higher education institutions, which was made by higher education professors chosen for scientific-educational and / or artistic-educational titles in the scientific or artistic field in which the study program will be run;

2. Proof of adequate space and equipment;

3. The adequate number of signed contracts with scientific-teaching and / or artistic-teaching staff;

4. Evidence of the necessary funds for carrying out study programs in the form of university statement that performs university study program alone or in the form of contracts with university with which the university study program is jointly performed.

The elaborate on the study program is one of important preconditions. It must be structured in a way that explains and proves the need for a new program. In order to fulfil the above conditions, **Elaborate on the program study must contain at least the following content:**

1. Introduction

1.1. Data on the University North

1.2. The decision on adopting the new study program

1.3. Professors who participated in the elaboration of the study program

2. Institutional preconditions

2.1. Development strategy of the University North

2.2. Standards and regulations for assessing the acquired learning outcomes

2.3. The participation of students in the processes related to quality assurance in higher education institutions

2.4. The participation of representatives of the labor market in the development of the higher education institution

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<sup>13</sup> In addition to the established way of application to perform a new study program for private higher colleges, public colleges and universities (Art.20). The terms of reference for the development of curriculum-year-old university graduate study "Sustainable mobility"

- 2.5. The organization of an information system for collecting, managing, processing and reporting statistical information related to the organization and the implementation of study programs and for those necessary for quality assurance
- 2.6. The standards and regulations of the higher education institution of the periodic review of study programs
- 2.7. The standards and regulations for protection of student rights
- 2.8. Standards and regulations for permanent training of employees of higher education institutions
- 2.9. Quality assurance of professional services of the higher education institution
3. General information about the study program
  - 3.1. Name of the study program
  - 3.2. Carrier / contractor of the program
  - 3.3. Type of study program
  - 3.4. The level of study program
  - 3.5. Scientific or artistic area
  - 3.6. Scientific or artistic field
  - 3.7. Scientific or artistic branch
  - 3.8. Admission requirements
  - 3.9. Duration of study program
  - 3.10. Total number of ECTS credits
  - 3.11. The academic title awarded upon completion of the program
  - 3.12. Documents of accredited undergraduate professional or university study program
  - 3.13. Compliance Analysis of the study program with the strategic objectives of the higher education institution
  - 3.14. Competency achieved upon completion of studies and work qualifications
  - 3.15. The mechanism for ensuring the vertical mobility of students in national and International Higher Education institutions
  - 3.16. The link of proposed university study with basic modern skills and professions
  - 3.17. The link of proposed university study with the needs of the local community
  - 3.18. Analysis of employability of students after completion of the study program
  - 3.19. Comparison of the proposed university study program with foreign accredited programs of reputable institutions of higher education, in particular accredited study programs from EU countries
  - 3.20. Previous experience of the proposer in the performance of the same or similar university study programs

- 3.21. Partners outside the higher education system (business, public sector, etc.) that participate in the implementation of the proposed study program
- 3.22. International cooperation of higher education institutions
4. Description of the program
  - 4.1. List of compulsory and elective subjects with the number of lessons required for their execution and ECTS credits
  - 4.2. Description of required and elective courses
  - 4.3. The structure of the study, the pace of study, student enrolment conditions in the next semester, enrolment conditions for particular courses
  - 4.4. The list of courses that students can take from the other study programs
  - 4.5. The list of courses that can be taught in a foreign language (English)
  - 4.6. Completion of studies
  - 4.7. Conditions under which the students who interrupted the study or lost the right to study at one study program can proceed with the study
5. Conditions for performing the program
  - 5.1. Location of the study program
  - 5.2. Documents concerning property, the right to use, lease or other valid legal actions
  - 5.3. Proof of a secured venue for higher education activities
  - 5.4. Proof of securing their own equipment
  - 5.5. Spatial capacity for holding classes
  - 5.6. Optimal number of students that can be enrolled in terms of equipment, venue and number of teachers
  - 5.7. List of teachers and associates who will participate in teaching at the start of the study program
  - 5.8. Data on teachers involved in holding classes (alphabetically, by surname)
  - 5.9. Estimation of study program costs per student
  - 5.10. Methods of monitoring the quality and performance of the study program
  - 5.11. Student support (academic, professional, psychological counseling, etc.)
6. Other
7. Appendix

### **List of Tables**

Table 1: List of compulsory courses with the number of teaching hours and ECTS credits

Table 2. List of elective subjects with the number of teaching hours and ECTS credits

Table 3. Conditions for enrolment into a semester

Table 4. Conditions for admission into particular courses

Table 5. List of elective courses that students can take from the other study programs in other departments at University North

Table 6. List of courses that can be taught in a foreign language

Table 7. Description of spatial and personnel requirements for carrying out study programs

Table 8 Description of staff conditions

Table 9: List and workload of teachers employed at higher education institution that participate in the implementation of the study program

Table 10. List and qualifications of teaching, research and professional associates

Table 11. Projection of secured funding sources for proposed program expenses

Table 12. Projections of the sources of financing of higher education institution

**List of Appendixes:**

Appendix 1. The license for undergraduate professional study Technical and economic logistics

Appendix 2. The Decision on adopting the study program by the Senate of the University North

Appendix 3. Opinion of organizations related to the labor market which support the establishment of study program

Appendix 4. CVs of teachers in EU format (European curriculum vitae format)

◆◆◆



University  
North

Review form for a study programme
<b>Study programme: "Sustainable mobility and logistics" (SML)</b>
<b>University Department:</b> Department of Technical and Economic Logistics
<b>Type of the study programme:</b> 1. university 2. professional
<b>Study programme level:</b> master/spec.
<b>ECTS credits:</b> 120
<b>Academic or professional title acquired upon finishing the study programme:</b> Master/Master engineer in Transport and Logistics

**Note:** In answers marked with \* (asterisk), explanation is required.

## 1. Reasoning behind the proposed study programme

- 1.1. Are the reasons for commencing the proposed study programme justified, considering public and private labour market needs?

YES  NO \*

Explanation:

Cities and regions are competing for well skilled tax payers, and citizens more and more ask for favourable conditions of life and work. Sustainable mobility is one important aspect.

Trained experts are needed to maintain and even increase the competitiveness of Croatian regions in Europe in the above sense.

- 1.2. Is the study programme in line with the strategic goals of the University?

YES  NO \*

Explanation:

Referring to the deliverables provided by the study, the programme addresses and combines the scientific streams of the University and links it to the needs of the labour market in the region.

## 2. General structure of the proposed study programme

2.1. Are the basic disciplines, required for the proposed scientific/professional/artistic field well represented?

YES  NO \*

Explanation:

The programme is well balanced referring to:

- transport engineering
- urban and transport planning
- economic and social sciences

2.2. Is the structure of the programme continuous and logical?

DA  NE \*

Explanation:

The modules of the programme are logical and provide a very flexible way of combinations according to own skills and objectives

2.3. Teaching load:

Acceptable

Too big

Too small

Explanation:

Difficult to say in general. Depends on the distribution of courses to individual professors / teachers.

2.4. Does completion of the study programme ensure acquiring of required competences (knowledge, skills and abilities) and methods of inference?

YES  NO \*

Explanation:

Courses are widely spread and provide a broad spectrum of skills and competences after completion of the studies.

2.5. Is the outcome of the study programme:

Appropriate

Too specialized \*

Too general \*

Explanation:

There is no risk for the outcome to be too specialised as the programme requires students to visit a multi-disciplinary set of courses. If anything, there might be a small risk for students not to focus along a particular line. The outcome might then be too general.

### 3. Courses: contents, teaching load and teaching methods

3.1. Please name the courses which you consider inappropriate within the proposed study programme (if any).

Explanation:

None.

3.2. Please name the courses which you find disbalanced in terms of proposed course content, teaching load and ECTS credits (if any).

Explanation:

There is maybe a bit much logistics in Semester 3.

3.3. Are proposed teaching methods appropriate?

YES

NO \*

Explanation:

I assume – didn't go into that very deeply.

If YES, are the means used for teaching (laboratory and other experimental equipment) appropriate for achieving the goal of the course?

YES

NO \*

Explanation:

See above: here I would have to guess. The deliverables I have at hand do not allow to make a definitive statement here.

#### 4. Comparison of the proposed study programme with compatible programmes within the EU

4.1. Is the study programme comparable with compatible programmes in the EU?

YES  NO \*

Explanation:

The extensive overview on similar studies in the planning phase to this programme has identified the most critical elements and has applied them in the proposed study programme.

4.2. Does the proposed study programme follow recommendations of relevant European or international professional associations (if any)?

YES \*

NO

NO recommendations exist

Explanation:

Follows the recommendations of the CIVITAS programme.

#### 5. Recommendations of the reviewer

Accept the proposed study programme without modifications

Accept the proposed study programme with minor modifications

Required modifications:

None

Study programme can be reviewed again after major modifications

Required modifications:

Reject the proposed study programme

Reasons for rejecting:

Additional remarks:

Signature:

Dr. Claus Doll  
Head of Business Unit Mobility

**Fraunhofer Institut**  
System- und  
Innovationsforschung  
Breslauer Str. 48  
**76139 Karlsruhe**



Date and place:

Karlsruhe, Germany, 22. July 2016





Review form for a study programme	
<b>Study programme:</b>	"Sustainable mobility and logistics" (SML)
<b>University Department:</b>	Department of Technical and Economic Logistics
<b>Type of the study programme:</b>	1. university 2. professional
<b>Study programme level:</b>	master/spec.
<b>ECTS credits:</b>	120
<b>Academic or professional title acquired upon finishing the study programme:</b>	Master/Master engineer in Transport and Logistics

**Note:** In answers marked with \* (asterisk), explanation is required.

### 1. Reasoning behind the proposed study programme

1.1. Are the reasons for commencing the proposed study programme justified, considering public and private labour market needs?

YES     NO \*

Explanation:

The new study programme is an opportunity for the education of a new generation of transport professionals in Southern Eastern Europe. European cities are becoming living laboratories where industries carry on pilot projects to experiment new devices, all kind of sensors and online information and communication systems. The involvement of universities and research centres in this process is still limited. The increasing availability of data that comes from city sensors, creates new opportunities not just for monitoring and management, it will also radically change the way we may describe, understand and design cities, challenging many fundamental assumptions of the city design and planning professions. For this reason students gaining knowledge on innovative techniques will help in changing the modes of transport planning not only in Croatia but in the EU and in other countries in the region.

1.2. Is the study programme in line with the strategic goals of the University?

YES  NO \*

Explanation:

The new study programme will provide access to higher education to many citizens of north-western Croatia for a long-term increase in the number of highly educated residents. Additional employment of high-quality teaching staff with acquired scientific, artistic and professional competence of teachers.

## 2. General structure of the proposed study programme

2.1. Are the basic disciplines, required for the proposed scientific/professional/artistic field well represented?

YES  NO \*

Explanation:

The new programme offers a holistic approach to sustainable mobility, providing students the opportunity to gain important knowledge and skills for their future careers, such as: ability to analyse, synthesize and design solutions to complex problems in the field of transport planning and traffic management processes; develop critical thinking; the ability to use research methods and procedures; ability to creatively search for solutions development and other problems of institutions or companies, their organization and management and other highly qualified jobs in the field of transport, or the development and application of scientific and professional achievements.

2.2. Is the structure of the programme continuous and logical?

DA  NE \*

Explanation:

It follows a very rational line, allowing students to gain the appropriate knowledge to solve mobility problems or be engaged in sustainable mobility projects & plans.

2.3. Teaching load:

Acceptable   
\*  
Too big

Too small <sup>\*</sup>

Explanation:

It is inline with the teaching load of other master programmes.

2.4. Does completion of the study programme ensure acquiring of required competences (knowledge, skills and abilities) and methods of inference?

YES  NO <sup>\*</sup>

Explanation:

The new master programme is ambitious enough to guarantee that students will acquire after completing this two-year university programme the required competences and skills needed to be actively involved in strategic planning processes, including knowledge of the basic elements of urban economics and geography, spatial planning, and particularly space-transport planning and modelling.

2.5. Is the outcome of the study programme:

Appropriate   
Too specialized <sup>\*</sup>   
Too general <sup>\*</sup>

Explanation:

It is in line with the best international master programmes in the field of sustainable mobility & logistics.

### 3. Courses: contents, teaching load and teaching methods

3.1. Please name the courses which you consider inappropriate within the proposed study programme (if any).

Explanation:

3.2. Please name the courses which you find disbalanced in terms of proposed course content, teaching load and ECTS credits (if any).

Explanation:

3.3. Are proposed teaching methods appropriate?

YES  NO \*

Explanation:

It is well recognised that instructional methods like problem based or project based learning significantly improve students engagement. They are recognised by universities, researchers and students as an advanced and efficient learning model.

If YES, are the means used for teaching (laboratory and other experimental equipment) appropriate for achieving the goal of the course?

YES  NO \*

Explanation:

To educate sustainable mobility and logistics students requires the experience with hands-on design-build projects that laboratory and other experiential equipment may facilitate.

#### 4. Comparison of the propose study programme with compatible programmes within the EU

4.1. Is the study programme comparable with compatible programmes in the EU?

YES  NO \*

Explanation:

The new study programme is comparable with other EU programmes specially master programmes in Sustainable mobility and logistics offer in England and Germany.

4.2. Does the proposed study programme follow recommendations of relevant European or international professional associations (if any)?

YES

NO

NO recommendations exist

Explanation:

The new study programme comes out from a series of European initiatives and conferences. As for example the **CIVITAS initiative** launched with the purpose of redefining the traffic measures and policies, in order to create cleaner and better transport systems in urban areas or the **World Association for space and traffic correlation research**<sup>1</sup>, through its work, actively seeks to promote interdisciplinary reflection on the development of transport system in accordance with the actual properties of a space and/or the **Association for European Transport** that works with basic topics as planning for the future, cycling, climate change, impact of transport on the environment.

## 5. Recommendations of the reviewer

Accept the proposed study programme without modifications

Accept the proposed study programme with minor modifications

Required modifications:

Study programme can be reviewed again after major modifications

Required modifications:

Reject the proposed study programme

Reasons for rejecting:

Additional remarks:

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<sup>1</sup> <http://www.wstlur.org>

Signature:



Andreu Ulied

Date and place:

Barcelona, July 19th 2016