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Erasmus+ CBHE Project:
CREATING THE NETWORK OF KNOWLEDGE LABS
FOR SUSTAINABLE AND RESILIENT ENVIRONMENTS
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WB Institution: **Higher technical professional school in Zvecan [HTPSZ]**

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Study on the needs, constrains and possibilities for the development of postgraduate study programme *Sustainable and resilient environments*

CONTENTS

INTRODUCTION

The fact is that the increase in the number of natural, technological and other types of risks and threats affects the environmental pollution. With the aim of establishing and developing security awareness and culture, acquiring and raising the level of general and specific knowledge and skills for fire protection, education is viewed and defined as basic preventive measure in modern environmental protection system.

In our country, within the existing educational system specific forms of professional training of personnel for environmental protection have been developed, all with the aim of creation of sustainable and resilient development.

Study program Safety at work - fire protection, is being realized on basic and specialized vocational studies, both in universities and higher education institutions, included our Higher Technical Professional School in Zvecan (HTPSZ).

The existing capacity of higher education institutions is not sufficient to cover the annual needs for new specialists in this field. This fact implies that the staff in this area is necessary, justifying the need for creation a master professional studies of vocational program Safety at work - fire protection.

The introduction (creation) of master study program Safety at work - fire protection at HTPSZ would have given a huge contribution to the wider community through education of professional specialists, whose knowledge and competence would imply our working and living environment safer and more secure.

Professionally educated and trained specialized staff in the field of fire protection are going to be important factors in the process of integration and operationalization of science and practice, using all their professional knowledge, skills and competencies. Therefore, we believe that it is of special interest to organize mentioned master study program. Graduated students of basic vocational studies shall be given the opportunity to acquire new and innovate already existing knowledge, vocational training and permanent education for the protection and management of the risks and threats of fire, through a series of organizational, educational forms and activities...

1. CREATION OF MASTER DEGREE VOCATIONAL PROGRAM: PROTECTION AT WORK - FIRE PROTECTION

Study program title: **Fire protection**
Type of studies: **Master vocational studies** – duration two years (four semesters 120 ECST).
Vocation: **Мастер струковни инжењер заштите на раду – заштита од пожара**

Study program will be implemented through:
compulsory subjects - covering basic knowledge that students need to master;
elective courses - which profiles the student closer to their education;
professional practice - which the student performs in the fourth semester;
Master's thesis - that the student realizes in the fourth semester.

1.1. The objectives of the study program

The objectives of the master of professional studies program derives from the basic goals and objectives of the HTPSZ as a scientific and educational institution as well as the study program purpose. The main objective of the study program is achieving competences and academic knowledge and skills in the field of fire protection engineering and application of scientific and professional achievements in order to solve the problem of fire protection and management so as development of modern fire protection systems. Specific objectives of the program are acquiring general and specific theoretical knowledge and practical skills for:

- identification of hazards and risks of fire in the workplace;
- analysis of the technological processes in terms of implementation of measures for protection against fire and explosion;
- engineering calculations of the combustion process relating to the stoichiometric and thermodynamic problems;
- identification and analysis of risks and protection against fire and explosion caused by the effects of electricity/electrical energy;
- design and maintenance of fire alarms and firefighting systems;
- organization and managing the fire protection systems;
- organization and management of interventions, rescue, evacuation and rehabilitation from fire and explosions;
- fire and explosion expertise;
- project management and application of project management principles in the field of fire protection;
- development and implementation of methodologies, methods, tools and procedures in the management of fire and explosion;
- application of information technology in fire protection engineering
- management and development of human resources in fire protection systems;
- critical evaluation of current problems of fire protection and the characteristics of their research and solving;

- innovative approaches and teamwork;
- continual education and knowledge development in the field of fire protection.

1.2. The purpose of the study program

The purpose of the study program of master professional studies is to educate students for Master vocation professional safety engineer - fire protection in accordance with the needs and concept development of economy and society in order to solve complex problems of fire protection in the workplace.
HTPSZ has defined as the main tasks and objectives the education of highly competent staff in the field of work and the environment protection in line with the vision, mission, policies and strategies of the quality and content of the study program Master program study is fully in correlation with the basic tasks and goals of the school.
The content of the study program will enable students to acquire knowledge, from the field of natural, technological, socio-humanistic and medical sciences; skills and competencies that will enable them to work on complex, multidisciplinary fire protection. Scientific disciplines and professional curriculums at this level of study enables students to acquire specific theoretical knowledge and application skills of fire protection, the development of critical thinking skills for teamwork and cooperation, while the variety of elective courses will encourage independence and creativity in designing the study, as well as innovative and multidisciplinary approaches the fire protection in the working environment.
In conditions of rapid technological development that brings prosperity, but also new potential hazards and risks of fire, this concept of the study program bill bring up educated staff who possess the knowledge, competencies and skills in the European and global frameworks, master engineers who can identify and propose ways to solve potential hazard and fire risks in the workplace and to ensure better living and working conditions. Bearing in mind the social, economic and broader social importance of fire safety, the experts of this profile are going to have socially justified and useful skills.

1.3. The structure of the study program

The structure of the study program is compliant with the standards for accreditation of study programs of the first and second levels of higher education, in accordance with the Bologna Declaration and the Law on Higher Education.

1.4. Competence of graduates

Mastering the master study program of professional studies of fire protection provides general ability for:

- analysis of the problems in the work and environmental areas;
- prediction of solutions and consequences;

- mastering the methods, procedures and processes of identification and assessment of risks in the working environment;
- development of critical thinking and approached solving the current problems in the field of protection;
- application of knowledges in practice;
- development of competences and communication skills with immediate and wider environment;
- development of professional ethics.

In addition, the program provides subject-specific skills and professional competence for:

- assessment and insurance risks from fire and explosion;
- supervision in the field of fire and explosion;
- optimization and management of available resources in the system of fire protection;
- preparation of reports on the status of fire and explosion;
- preparation of plans and technical documents in the field of fire and explosion;
- design of specific surveillance system, fire alarms and fire fighting;
- organization and management of interventions, rescue, evacuation and rehabilitation of fire and explosion;
- expertise in fire and explosion;
- education and knowledge management in the field of fire and explosion;
- training, professional selection and development of skills in the field of fire and explosion;
- drafting normative acts in the field of fire and explosion;
- development of methodologies, methods and procedures for the management of the system of fire protection;
- development of methods for assessing the effectiveness of the fire protection system;
- project management and innovation in the system of fire protection;
- organization and management of the system of fire protection;
- application of information technology in fire protection engineering;
- development of professional engineering ethics and professional responsibility;
- work in a team composed of experts from various fields (multidisciplinary team);
- innovation activities and teamwork in emergency management;
- management activities, maintenance of facilities, installations and equipment;
- education and training of employees in safety and health at work;
- organizing and managing the system of health and safety at work in organizations;
- preparation and participation in the development of work place risk assessment.

2. CURRICULUM FOR MASTER PROFESSIONAL STUDIES, PROTECTION AT WORK - FIRE PROTECTION

Study program includes 9 compulsory, 4 elective courses, which are selected from 8 offered, professional practice and master thesis.
Each curriculum is evaluated with a certain number of ECST credits.
In the structure of the study program the percentage distribution of different types of cases is as follows:

- academic general education
- theoretical-methodological
- scientific expertise
- professional application

Overall student's engagement consists of active teaching (lectures, exercises, laboratory exercises, seminars and other forms of active classes), individual work, tests, exams, preparation of the master thesis and other forms of engagement. Practical work is an integral part of the study program. It is carried out in the chosen company or institution with the aim of training students for the practical application of acquired knowledge to solve existing problems in working and environmental protection. The study program is completed by the preparation and defense of the master thesis. Through the Master's thesis student demonstrates the ability to synthesize and apply the acquired theoretical and practical knowledge to solve problems in the system of protection at work and fire protection. Upon completion of studies, the student acquires the academic title:

Master vocational engineer for protection at work - fire protection

A list of compulsory and elective curriculums for Master of Professional Studies
First year:
1. The methodology of scientific research - compulsory
2. The dynamics of fire - compulsory
3. Protection of buildings against fire - compulsory
4. Risks in Manipulating Hazardous Substances - compulsory
5. Security of strategic energy facilities - compulsory
6. Maintenance of technical systems - elective
7. The economics of fire protection - elective
8. System Engineering - elective
9. Project Management - elective

Second year:
1. Fire protection due to the effects of electricity - compulsory
2. Information technology in the protection - compulsory
3. Equipment for the intervention and rescue - compulsory
4. Safety and Health at Work - compulsory
5. Ventilation of fire-threatened areas - elective
6. Security and emergency education - elective
7. Design and maintenance of fire protection systems - elective
8. Management and Human Resource Development - elective
9. Professional Practice
10. Master's thesis

2.1. The goals and outcomes of study curriculums

The methodology of scientific research
The goal of the program content: To enable students to successfully write scientific papers and prepare the master thesis.
Learning outcome: The ability to understand the different scientific methods used in the scientific literature - Ability to successfully cope with the scientific literature - the ability to write successful scientific work in the field of interest - the ability to create and successful complete the Master's thesis

The dynamics of the fire
The goal of the program content: Acquiring knowledge on fire as a dynamic process that takes place in space and time. The study of the development phases of a fire, the basic parameters of development of fire within individual developmental stages. The phenomena that accompany the dynamics of fire (flash-over, backdraft, bleve ...). The dynamics of fire in time and space (both indoors and outdoors). The influence of parameters of the surrounding environment on the development of a fire.
Learning outcomes: Understanding the dynamics of fire, which is a base for the actions in the field of preventive, repression and rehabilitation of fire protection.

Protecting of buildings against fire
The goal of the program content: Enabling students to: analyze the situation of the high-building construction and its structure in terms of the risk of fire, evaluating risk and vulnerability from fire in the facility, designing and installation of the technical preventive measures for the protection of fire in high-building constructions.
Learning outcome: The student who successfully completes course is going to be qualified to: evaluate the risk of fire in the high building constructions; independently or in a team develops projects of fire protection for high-building constructions, as well as parts of the investment and technical documentation of the buildings.

Risks in Manipulating Hazardous Substances
The goal of the program content: The objective is to familiarize students with hazardous materials, their characteristics, procedures and responsibilities for handling and manipulating them. Students should acquire knowledge about safety in the transport of dangerous goods, become familiar with the rules, laws, agreements, regulations, decisions and standards governing hazardous materials and their transport. In the framework of this course, students will learn about the types of transport means and modes of transport of hazardous substances, and protection measures when reloading hazardous substances, and protection measures in accidents.
Learning outcome: After passing the exam, students will be able to apply acquired knowledge in practice, to evaluate the dangers that can occur during operation and handling of hazardous materials and professionaly contribute in elimination of the consequences in the event of an accident.

Safety of Strategic Energy Facilities
The goal of the program content: educational goal includes introducing basic concepts of security of strategic energy and nuclear facilities and plants and its application. Based on the analysis of severe nuclear accidents (Chernobyl, Fukushima)

gaps in the security of nuclear installations will be analyzed as well as risks related to the use of nuclear energy for peaceful purposes.
Learning outcome: Students acquires knowledge about the basic concept of security that must be taken into account in the design and maintenance of strategic energy system. Students will also be familiar with basic safety systems of nuclear plants as well as the basic methods of safety analysis (probabilistic and deterministic) applicable both to nuclear power and the energy industries in general.

Одржавање техничких система
Циљ програмског садржаја: Стицање знања о процесима одржавања техничких система у функцији безбедности опреме, спречавање хаварија у технолошком процесу.
Исход учења:
Савладавањем програмског садржаја стичу се теоретска и практична знања о одржавању опреме, техничких система, методама одржавања и безбедности.

Maintenance of technical systems
The goal of the program content: Acquiring knowledge about the processes of maintenance of technical systems in function of safety equipment and prevention of accidents in the technological process.
Learning outcome: After the successful completion of program content students will acquire the theoretical and practical knowledge about equipment maintenance, technical systems, methods, maintenance and security.

The economics of fire protection
The goal of the program content: Acquiring knowledge about the negative economic consequences of fire and explosions in the working environment and training for practical evaluation of direct and indirect damage and the effects of investment in prevention.
Learning outcome: Qualifying students for practical research and analysis of direct negative consequences in the field of fire and explosion, as well as understanding the negative economic consequences of fire and explosions and their overall impact on the economy.

System engineering
The goal of the program content: Acquiring knowledge on basic characteristics, process and systems engineering disciplines, and the models and methods of decision making and evaluation of effectiveness.
Learning outcomes: Ability to connect engineering and managerial demands in the process of analyzing and solving the problem of protection; for the development and application of methods and procedures for assessing the effectiveness of the protection system so as engaging in teamwork and collaborative decision making.

Project Management
The goal of the program content: Acquiring knowledge in the context, processes and tendencies of development of the concept of project management and the application of the principles of project management in preventive engineering.

Learning outcomes: Mastering the program content, students acquire the ability to use and develop the concept of project management in the field of protection of the working environment, the organization of project management and implementation of software tools for project management and the protection of the working environment.

Fire protection due to the effects of electricity
The goal of the program content: Acquisition of expertise for the identification and analysis of risks and the protection of material goods, cultural values and human life from fire and explosion caused by the effects of electricity.
Learning outcome: After the successful completion of program content, students are able to: identify hazards, analyze and evaluate the extent of protection the risk of fire or explosion due to the effect of electricity; examine the safety of electrical installations, devices, equipment and systems of protection against static and atmospheric electricity.

Information technology in the protection
The goal of the program content: Acquiring knowledge on the application of information technologies in safety at work and fire protection.
Learning outcome: Skill of application of information technology in solving of specific management problems in protection system management; proficiency in the use of information and communications technology in the monitoring of news in the profession, mastering skills, teamwork and decision-making in the protection system.

Equipment for intervention and rescue
The goal of the program content: Acquiring knowledge about the equipment and means of intervention and rescue, firefighting equipment types as well as providing help during the intervention of protection and rescue.
Learning outcomes: Having knowledge of correct choice and use of equipment and fire extinguishers according to the type of fire, the place of the intervention. Possession of skills to calculate the required amount of fire extinguishers as well as provision of other forms of rescue interventions.

Safety and Health at Work
The goal of the content: Acquisition of theoretical and practical knowledge in the field of general safety and health at work. Training for technical documentation regarding compliance to safe and healthy working conditions.
Learning outcomes: Acquiring knowledge on training, managing safety and health at work in accordance with the regulations and standards of domestic and European legislation. Create and implement the necessary safe and healthy working conditions. The basics of risk assessment in the workplace. Way to reduce and manage the remaining risks that could not be removed by known technical solutions.

Ventilation of fire-threatened areas
The goal of the content: Acquisition of theoretical and practical knowledge of ventilation systems for fire-threatened areas.
Learning outcomes: Having a knowledge of fire-threatened areas, ventilation systems, techniques of ventilation and smoke removal in fire-affected buildings.

Education for Security and Emergencies

The goal of the content: Familiarizing students with educational needs for security in emergency situations; training for the planning, organization, implementation and evaluation of educational activities for the safe operation and action in emergency situations.
Learning outcome: Possession of knowledge in the field of education for occupational safety, fire protection and emergency management

Design and maintenance of fire protection systems
The goal of the content: Exploring the reasons for the design and installation of fire protection systems in accordance with national and international standards. Acquiring knowledge about the design, operation and maintenance of fire protection systems principles. Training for independent design and maintenance of fire protection systems.
Learning outcome: Qualifying students for the formation of project task and project development for fire protection system as well as training for the maintenance of fire-extinguishing systems.

Management and Human Resource Development
The goal of the content: Acquisition of theoretical concepts of management and human resource development and understanding of their mutual connection and influence. Acquiring knowledge and skills for effective action to develop human resources in the system of security and protection. The development of critical thinking on different aspects of the management and development of human resources. Consideration of the basic characteristics of the development of human resources in national and international context.
Learning outcomes: Having developed a system of knowledge about modern concepts, strategies and opportunities for human resource management; competencies - knowledge and abilities for efficient operation of the development of human resources in the system of working and living environment.

3. Institutional capacities for the development of a new study program

Higher Technical School of Professional Studies, began operations in 1961 under the name of Technical College, on the basis of the Decision of the Executive Council of AKMO br.2671 07/10/1961. The school began operating in the premises of the current Faculty of Technical Sciences in Kosovska Mitrovica. It was the only school of its kind in the area of the Autonomous Province of Kosovo and Metohija, where on a two-year education level; engineers of metallurgy, chemistry and industrial mining were educated.

Departments

In school year 2006/2007 new programs were introduced: the mechanical engineering segment – Production Management and the electrical engineering department - Management in electrical engineering with three-year duration and according to European standards.

In 2007/2008 a new study program has been accredited at the mechanical engineering department - Computer engineering, as well as Energetics at the electrical engineering department.
In 2011/2012 school continues the practice of monitoring trends and the mechanical section accredits new study program - Fire protection.
School is accredited for teaching in specialist professional studies in disciplines Energetics, Production management and Fire protection.
In the future it is planned to open new contemporary study programs at the undergraduate level and accreditation of Master study programs.

Space

School possesses 1,600 square meters of usable space, with 7 classrooms and 9 laboratories.
In 2007, the school has from its own funds managed to equip the cabinet for studying IT subjects from the existing curriculum. The cabinet is equipped with 18 computers of the latest generation and enables the all-day internet access. Also, in the same period school renovated and refurbished the laboratories for performing practical exercises with students.

Personnel

This highly specialized institution employs a total of 47 workers, of which 20 teachers and 11 doctors of sciences, 9 masters and 2 graduate engineers. The need for highly qualified teaching staff still exists and school is constantly working to increase the number of employed scientists.

Laboratories

So far, the school has equipped and put into operation the following laboratories:
• Laboratory for electrical machines,
• Laboratory of Physics,
• Laboratory for electrical measurements,
• Laboratory of Materials and Components,
• Laboratory for testing of materials,
• Laboratory for machining,
• Laboratory for machinery and tools,
• Laboratory for hydraulics and pneumatics.
• Laboratory of Informatics,
• Cabinet for the study of foreign languages.

4. ANALYSIS OF MARKET NEEDS

According to data from the Labor Force Survey in the previous year, while the total unemployment rate was 23%, the youth unemployment rate was far higher (unemployment rate of young people between 15 and 19 years of age was 62.2% of

those between 20 and 24 years old 48, 8% and between 25 and 29 years 35.6%), which exceeds the rate in most neighboring countries. In the countries of Southeast Europe, youth unemployment well over 30%, while the percentage of unemployed people aged 15 to 24 years in the EU is around 16%.

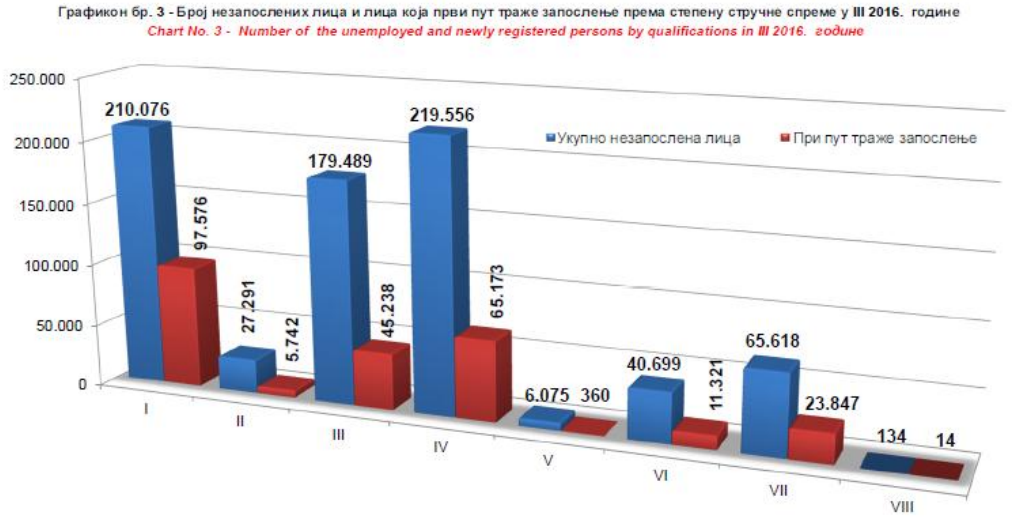
As one of the biggest causes of such a state analysts most commonly cited problem of non-compliance of the educational system with the real needs of the economy, and that a number of applicants of job vacancies remain unfilled because there are no persons with adequate knowledge and skills, and on the other hand there is a large number of persons with occupations for which there is no demand on the labor market. Therefore, understanding the structure of employment and unemployment in comparison to consider the real needs of the labor market is crucial for the design of the proposal changes relating to flexible educational programs that are tailored to the needs of the labor market and create employment program that by its measures more effectively track the current the labor market situation.

Still about 10% of the population in the Republic of Serbia does not complete primary school, secondary school enrolls between 90% and 95% of those who complete primary school, about 15% of enrolled do not complete secondary education, and only 13% finishes college or university. The situation is somewhat better if one looks only active population, but the level here is much lower than the EU average (19% of tertiary graduates, compared to the EU average of about 30%). Complex situations and unfavorable indicators of the labor market, the mismatch between supply and demand in the labor market and the lack of a system qualification and vocational education with the EU, are challenges that will face the Republic of Serbia in the future.

The level of education in the world has increased in the period from the 70s of the twentieth century, and, consequently, highly educated and participation in the labor force with a corresponding reduction in the share of those with secondary or lower education. On the labor market of most developed countries, there has been a dramatic turnaround in the demand for labor in favor of those with higher education. One of the five priority objectives set by the European Commission and contained in the document entitled "2020" refers to increasing the level of education in all EU member states. In the context of achieving the main goals of EU economic policy and a competitive, knowledge-based economy, the share of population with tertiary education by 2020 should amount to 40%. Serbia, with only 6.4% of highly educated population (Press release - the first results of the census for 2002, 2002, p. 38), is among the countries with extremely unfavorable educational structure which has negative implications for the labor market indicators. Serbia lags behind most European countries and in terms of investment in education, research and development, use of information and communication technologies and the application of research results.

Unfavorable trends in the labor market of Serbia, among which one should emphasize the historical minimum number of employees, partly attributable to the uneducated, unskilled and non-competitive labor force. In developed market economies, there is a positive correlation between education levels and employment rates, and highly educated are much less likely to be unemployed. With the increased level of education

risk of unemployment is being reduced, which is considered and its greatest benefit. Education not only contributes to the quality of the workforce, but also provides better working conditions and higher wages and shorter duration of unemployment. The benefits of education are multiple and for the individual and for society. At the individual level, a higher level of education allows for greater earnings and reduces the risk of unemployment throughout working life.



Source: Data NES - Monthly Statistical Bulletin, March 2016, page 11

Among the unemployed registered with the National Employment Service, mostly are unskilled and those with secondary education, a job is looking 65.618 university graduates, more than 100 Master's and PhDs. In Serbia, unlike European countries that are for a long time preparing for the changes in the labor market in connection to the advancement of science and technology, there has been no serious study on the future needs for labor. The National Employment Service (NES) say that the current classification of vocations, adopted in 1990, was designed according to the system from the time immediately after the breakup of Yugoslavia.

According to the analysis of the Union of Employers, for example, in the next few years, 10 to 15 thousand people in Serbia will be able to work in companies for the recycling and other waste management companies, and a safe workplace can count and those who are trained to care for the elderly, in nursing homes ...

Occupations in the coming decades will be among the most wanted are professional ecologist, an analyst with Environmental Protection, Physical Chemistry, Mechatronics engineer, Engineer of security and safety at work ...[1]

[1] http://www.b92.net/biz/vesti/srbija.php?yyyy=2012&mm=01&dd=16&nav_id=574144

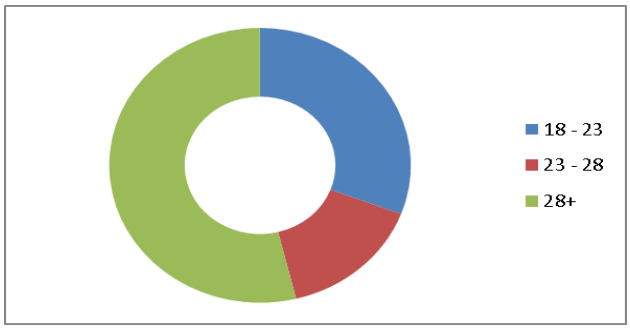
5. INTERVIEWING PROFESSIONALS

The survey for professionals covered a total of 36 employees, including 13 police officers, 16 fire fighters employed in Zvecan and Mitrovica and 7 officers for safety at work in the public sector.

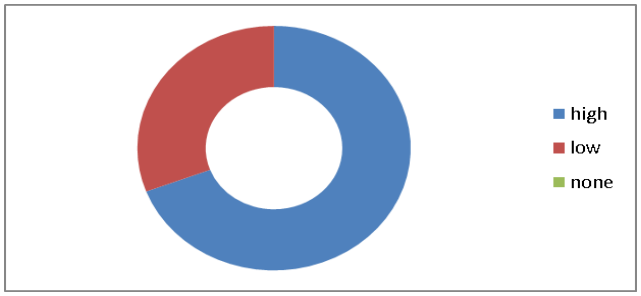
The main objective of the survey was to evaluate the interest of professionals to continue their education at the master vocational studies in the field of safety at work - fire protection. Due to the specific profile of the difference compared to the other partners, questionnaire has been designed by teachers and staff of HTPSZ.

Some of the results of the survey are presented below:

1. Year of age



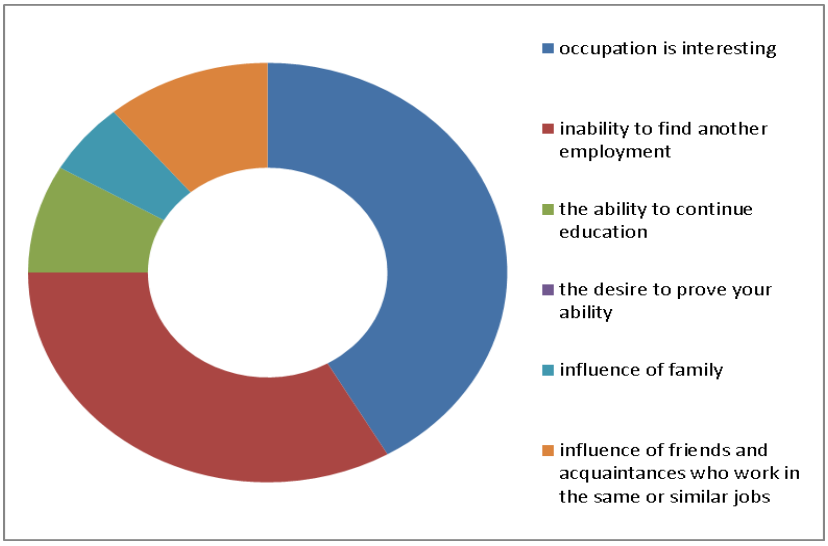
2. What are according to you the dangers and harmful effects that can lead (or lead) to pollution and endangering the life and work environment?



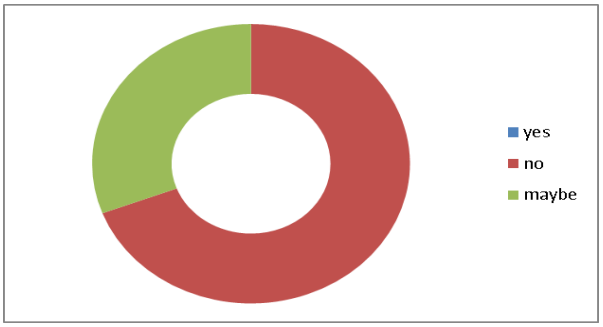
3. Would you like to gain new and expand existing knowledge in the field of living and working environment protection?

   100% of respondents answered YES

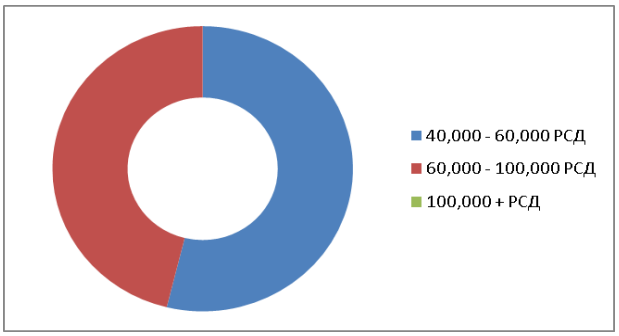
4. What would be the main motivation to continue your education?



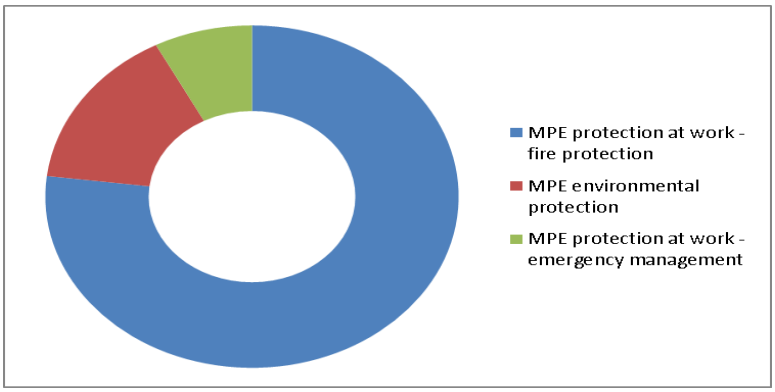
5. Is it probable that after graduation you will be employed?



6. What price would you be willing to pay to continue your education per school year?



7. Which of the following educational course you find most attractive?



Most respondents, 53.85% was over the age of 28 years. Nearly all, 92.4% had previously acquired education from technical and technological fields.

69.23% of respondents believe that there is a high level of risk and harms that may result in or cause pollution and endanger the environment.

The largest number of respondents believes that there is a lack of knowledge in the field of occupational safety and 100% of respondents answered positively when asked whether they would like to continue their education. The main reasons cited are: occupation is interesting 41.67%; inability to find other employment 33.30%; the influence of friends and acquaintances who work in the same or similar jobs 11.1%; the ability to continue their education 8.3% and 5.5% family influence.

The most disheartening is the fact that 69.23% of respondents said that it is not certain that further education will guarantee the employment, 30.77% believe that there is a possibility, while none of the respondents were not sure about the employment guarantee.

As expected the price of education is concerned, half of the respondents expected and is ready to pay from 40,000 - 60,000 RSD second half of 60.000 to 100.000 RSD while not one respondent was prepared to pay higher tuition fees than 100,000 RSD per year of schooling.

The most attractive course for the majority of respondents 76.92% is fire protection; 15.38% believe that the most attractive is environmental protection, while 7.69% said it was to emergency management.

6. INNOVATION OF EXISTING SPECIALIST STUDY PROGRAM (PROTECTION AT WORK-FIRE PROTECTION)

In our country evident are positive developments in terms of adopting new legislation in the field of education. The adopted amendments to the Law on Higher Education (10.09.2014) introduced the Master professional studies in the educational system of the Republic of Serbia. The National Council for Higher Education (NCHE) has given the green light for the future of master vocational education and is now waiting for approval by the Commission for Accreditation (ACA). However, due to the uncertainty of starting the accreditation process of master professional studies in the near future, the current study program could be innovated

through the introduction of new courses allowing students the theoretical and practical training in the laboratories of the Erasmus + project. Precisely the equipment in the lab, especially components for the simulation of the fire alarm system and components for maintenance (charge) fire extinguishers, contribute to achieving these goals.

Introduction of new subjects is in line with the needs for educated professionals for economic and industrial systems, public enterprises and public institutions prepared and trained to deal with such complex problems accumulated in the field of protection and management of the risks and dangers of fire, primarily based on preventive operations in order to achieve an acceptable level of risk in case of adverse events.

Study program: **Fire Protection**
Type of study: **Specialist professional studies** lasting one year (two semesters total 60 ECTS).
Occupation: Professional engineer for protection at work - fire protection - Specialist

Study program will be implemented through:
• compulsory subjects - covering basic knowledge that students need to master;
• elective courses - which profiles the student closer to their education;
• professional practice - that the student performs in the second semester;
• specialist work - the student realized in the second semester.

6.1. The curriculum in specialist professional studies PROTECTION AT WORK-FIRE PROTECTION (new subjects VS old subjects)

No.	Existing subjects	New subjects
1.	Mathematics (selected chapters)	Fire protection due to the effects of electricity
2.	The legislation of the European Union in fire protection	The system of environmental protection management and sustainable development
3.	Reengineering of fire protection	
4.	Internet wireless sensor networks	Modeling and simulation of fire
5.	Systems for smoke and heat drainage	English language – higher level
6.	Inspection, testing and servicing of fire protection systems	
7.	Health and psychological measures of fire protection	Maintenance of technical systems
8.	Assessment of damage and insurance	The principles of insurance

	premiums	
9.	Risk management and risk assessment methods	Design and maintenance of fire alarm systems
10.	Professional practice	
11.	Specialist work	

6.2. The goals and outcomes of study curriculums

Fire protection due to the effects of electricity

The aim of the program content: Acquisition of expertise for the identification and analysis of risks and the protection of material goods, cultural values and human life from fire and explosion caused by the effects of electricity.
Learning outcome: After the successful completion of program content, students are able to: identify hazards, analyze and evaluate the extent of protection the risk of fire or explosion due to the effect of electricity; examine the safety of electrical installations, devices, equipment and systems of protection against static and atmospheric electricity.

The system of environmental management and sustainable development

The aim of the program content: Acquisition of basic knowledge about the development of the concept of sustainable development, global environmental problems, causes and consequences of environmental degradation, the basic principles of strategy and policy for sustainable development, the principles of environmental risks, water resources and waste management. The course includes knowledge in the field of standardization of environmental management, methods of assessment of environmental impacts, life cycle and so on.
Learning outcomes: Ability to apply principles of sustainable development and environmental protection in practice.

Modeling and simulation of fire

The aim of the program content: Acquiring knowledge on modeling principles and methods of modeling and simulation of fire. Introduce students to the role of modeling in the process of analyzing the risk of fire, fire modeling scenarios, making analysis, multi-criteria analysis of risk. The course includes modeling and simulation of the characteristic risk of fire.

Learning outcome: Skill for modeling and simulation scenarios of typical risk of fire in the working environment in order to predict the development of risk in real conditions and / or decision support in the operational management of the risk of fire.

English-higher level

The aim of the program content: Training all language skills (reading, listening, writing and speaking). Expanding vocabulary of common spoken language and the vocabulary from the field of fire protection.
Learning outcome: After successfully mastering the material students are able to use spoken and written English at a wider range of topics in everyday life and business situations.

Maintenance of technical systems

The aim of the program content: Acquiring knowledge about the processes of maintenance of technical systems in safety equipment, prevention of accidents in the technological process.
Learning outcome: After the successful completion of program content acquired the theoretical and practical knowledge of equipment maintenance, technical systems, methods, maintenance and security.

The principles of insurance

The aim of the program content: The course aims is to enable students to develop basic insurance products, defining requirements for insurance and finding the most effective ways for economic protection due to damage or destruction of things, health and life due to calamitous events and accidents.
Learning outcomes: Students will be able to determine the need for insurance protection for enterprises and individuals to recognize the risk and the danger that threatens the things and people, and to design the most appropriate form of insurance for different types of assets.

Design and maintenance of fire alarm

The aim of the content: exploring the reasons for the design and installation of fire protection systems in accordance with national and international standards. Acquiring knowledge about the principles of design, operation and maintenance of fire protection systems. Training for independent design and maintenance of fire protection.
Learning outcome: Qualifying students for the formation of project task and project development system for fire protection as well as training for the maintenance of fire-extinguishing system.

CONCLUSION

One of the most important world issues and factors to further sustainable development of human civilization are certainly frequent occurrence of natural disasters and fire. The need for sustainable development imperative imposes a need for educated experts who will respond adequately in the field of fire protection. We would therefore

introducing the subject: Protection of fire due to the fact the electricity system of environmental management and sustainable development, modeling and simulation system, English language - a higher level of maintenance of technical systems, principles of security and design and maintenance of the fire alarm system, further expand existing knowledge of students and take advantage of all the features and benefits of practical work in the laboratory and thus further improve the performance of specialist study program of fire protection. Graduates will be prepared to respond to the continuing problems that arise in an environment which will contribute to sustainable solving of serious and accumulated problems in the industry, economy and science in our country, regionally and globally.

For personnel who are competent and professionally dealing with the problems of fire protection could be said to have primary responsibility for the protection of both the protection at work and the environmental protection. Their area of activity is the most immediate and most direct way connected with the fate of working environment in general. Achieving a quality and successful teaching-scientific process of education and training of these professionals may induce less adverse effects and losses in the environment. Especially if one takes into account that these personnel in addition to preventive, operative and rehabilitation operation should provide other necessary pre-conditions for the mobilization of the actions of all people in the protection and responsible and preventive action in their daily work and life activities.