| Study Programme | Occupational Safety and Health |
|---|---|
| **Qualifications awarded** | Second degree |
| **Professional title** | Master (appl.) in Occupational Safety |
| **Number of ECTS credits** | 300 |
| **Level of qualification according to the National Qualification Framework and the European Qualifications Framework** | VS-2 (NQF)<br>Second cycle (EQF) |
| **Field of study** | Engineering and technology |
| **Mode of study** | Full-time |
| **Language of instruction** | Serbian |
| **Work-based learning** | In the College laboratories equipped with state-of-the-art equipment;<br>In business systems whose main activities are relevant to the needs of this study programme. |
| **Head of the study programme** | Vesna Marjanovic, PhD |

**Programme outcomes**

The main objective of the study programme is to achieve competences, knowledge and skills in the field of occupational safety and environmental protection, as well as the application of scientific and technical achievements in the field of engineering, management and environmental protection. The utmost outcome is the education of a Master of Applied Science in Occupational Safety and Health.

**Programme outcomes**

**Specific objectives** of the MSS Occupational Safety and Health programme include the achievement of competencies and skills in the areas of:

- research methods;
- computer science methodology;
- project management;
- achieving specific practical skills necessary for the successful completion of work in the field of safety and health at work including the tourism economics, as well as the selection of personal protective equipment;
- risk management and risk assessment methods;
- hygiene and occupational medicine;
- ergonomics of space and equipment;
- prevention of danger and protection against non-ionizing radiation;
- measurements of noise and vibration and the implementation of protective measures;
- protection of buildings from fire;

- technological systems and safety of work equipment, production processes and systems, installations and installations of sub-critical, automated production lines, transport systems, etc.;
- hazardous waste management and waste management;
- monitoring, analysis, control and protection of air;
- monitoring, analysis, control and protection of land;
- preparation of drinking water using modern methods.

**Course-specific competencies**

Students will be able to:

- work as entrepreneurs and perform managerial tasks;
- plan and conduct applied and developmental research;
- control the work and evaluate the results of others in order to improve the existing practice;
- put the acquired theoretical knowledge about risk assessment in the workplace to practice, and take risk management measures;
- managing projects in the field of occupational safety and health;
- contribution to the development of optimal technologies, from the point of view of occupational safety and health;
- analysis of hazard that might occur in vessels and installations under pressure, and application of protective measures;
- application of acquired knowledge and regulations relating to the methods of protection of buildings from fire during the design and execution of construction works;
- professional use of information technology in measurement, in the processing of results, and the application of research methods in the field of occupational safety and health;
- application of safety and occupational safety measures in the realization of automated technological lines and processes;
- application, control and improvement of safety and occupational safety measures in transport systems logistics;
- measurement of noise levels and vibrations of work equipment in the working environment, the use of these measurements for diagnostic purposes, as well as the use of methods for controlling noise and vibration;
- measurement of non-ionizing radiation, processing of measurement results, preparation of reports and reporting on the state of non-ionizing radiation in the working environment;

- use of scientific-professional literature, acquired knowledge and practical experience, as well as participation in the implementation of research programmes, implementation of the methodology of writing, communicating and presenting results and conclusions with adherence to the ethical framework in the field of occupational health and safety;
- organization and planning of all necessary activities in the field of hazardous waste management and measures for the protection of the environment;
- development and implementation of plans and programmes of air monitoring, analysis and protection (acquisition of skills and experience of obtaining valid results on the field and in laboratory conditions);
- application of knowledge in the field of migration of pollutants and remediation of contaminated soil (in situ and ex situ technologies based on biological (bioventilation, biostimulation, phytoremediation, biodegradation in bulk and solid state) and abiotic processes (physical-chemical, thermal and other processes));
- designing and managing drinking water systems using modern methods (micro and ultrafiltration, reverse osmosis, improved coagulation, advanced oxidation processes, adsorption);
- practical application of knowledge in the field of occupational health and safety regarding risk assessment in the workplace, and implementation of risk management measures;
- project management in the field of work and environment protection.

# MASTER'S VOCATIONAL STUDIES:
# OCCUPATIONAL SAFETY AND HEALTH

| | |
|---|---|
| 1 | Research Methods and Science Communication |
| 2 | Project Management |
| 3 | Fire Protection of Buildings |
| 4 | Electromagnetic Radiation |
| 5 | Informatics Research Methodology |
| 6 | Transport Systems |
| 7 | Risk Management and Risk Assessment Methods |
| 8 | Air Quality Monitoring and Management |
| 9 | Workplace and Equipment Ergonomics |
| 10 | Safety in Manufacturing Sector |
| 11 | Hazardous Substances and Protection |
| 12 | Hygiene and Occupational Medicine |
| 13 | Pressure Plants and Installations |
| 14 | Soil Quality Monitoring and Management |
| 15 | Noise and Vibration |
| 16 | Modern Drinking Water Treatment Methods |
| 17 | Personal Protective Equipment |
| 18 | Safety During Construction and Occupation of Buildings |
| 19 | Technology Systems and Work Equipment Safety |
| 20 | Safety in Tourism Industry |

**Study programme: OCCUPATIONAL SAFETY AND HEALTH**

**Type and Level of Studies: MASTER VOCATIONAL STUDIES**

**Course code and title: RESEARCH METHODS AND SCIENCE COMMUNICATION**

**Teacher (Surname, middle initial, name):** Milutin R. Đuričić

**Course status:** Compulsory

**Number of ECTS credits:** 6

**Prerequisites: no**

**Course aims:**

Acquisition of advanced specialized knowledge on basic methods of knowledge and research, research methodology, different methodological approaches of research, realization of research, data processing, conclusion and elaboration on the basis of collected material.

**Learning outcomes:**

Students will acquire knowledge that will enable them to solve complex problems in an innovative way, and to conceive and independently manage knowledge and skills related to methodological research practice and the academic way of presenting collected materials related to the development of safety and health protection of workers, and beyond. Students will be able to manage and guide complex communication, interaction and collaboration with others from different social groups. They should be able to apply complex methods and software packages related to methods of research and scientific communication. They should act as entrepreneurs and undertake managerial tasks, and should independently with full responsibility lead the most complex projects, plan and implement scientific and / or applied research. They should control the work and evaluate the results of others in order to improve existing practice.

**Syllabus**

*Theoretical instruction:*

Basic concepts of science. Ethical framework of scientific research. Sources of scientific information. Methods of scientific research. Organization of scientific research. Publications, scientific and professional papers. Writing of scientific publications. Information support for the preparation of scientific and / or professional publications. Seminar papers and their production. Master thesis preparation and writing.

Language, style and publication. Plagiarism. Text revision. Academic reading and academic writing. Communication skills and communication in the team. Presentation and conferences.

*Practical teaching:*

Design and creation of a research project and writing of professional paper for presentation at the International Scientific and Professional Conferences organized by the School.

**Literature:**


1. Đuričić R.M., Đuričić R.M., Petrović M.S., Metodologija izrade specijalističkog rada, VPTŠ, Užice, 2015.
2. Kundačina, M., Banđur, V. Akademsko pisanje, Užice: Učiteljski fakultet (4 poglavlja), 2009.
3. Jurčić, A. Fejos A., Dinić M., Čupić M., Kako uspešno čitati i pisati**:** kritičko čitanje, akademsko pisanje, pisanje izveštaja, veštine prezentacije, Beograd 2010.
4. Branković S., Metodologija naučnih istraživanja, Beograd, 2008.


| **Number of active teaching classes: 60** | | | | Other classes: |
|---|---|---|---|---|
| Lectures: 2x15=30 | Practical classes: 2x15=30 | Other teaching forms: | Study research work: | |

**Teaching methods:** Lectures, exercises, assignments, analysis of literature.

**Knowledge evaluation (maximum 100 points)**

| **Pre-exam obligations** | **Points** | **Final exam** | **Points** |
|---|---|---|---|
| Activity during lectures | 10 | Written exam | 30 |
| Practical classes | 10 | Oral exam | |
| Colloquia | 40 | | |

| | | | |
|---|---|---|---|
| Seminar papers | 10 | | |
| **Assessment methods**: | | | |

**Study programme: OCCUPATIONAL SAFETY AND HEALTH**

**Type and Level of Studies: MASTER VOCATIONAL STUDIES**

**Course code and title: PROJECT MANAGEMENT**

**Teacher (Surname, middle initial, name):** Sagić Zorica, Nenad I. Milutinović

**Course status:** Compulsory

**Number of ECTS credits:** 6

**Prerequisites: no**

**Course aims:**

Acquiring advanced specialized knowledge that will enable students to understand the concept of project and project approach, and that will allow them to know how to design, implement and complete a project. The aim is also to teach them to work as part of a team, as well as to use information technology to support the successful implementation of projects.

**Learning outcomes:**

Students should master the knowledge that enables them to solve complex problems in an innovative way, and to conceive and independently manage knowledge and skills related to project management. They should learn how to manage and guide complex communication, interaction and collaboration with others from different social groups. They should learn how to apply complex methods and software packages related to project management. They should act as entrepreneurs and undertake managerial tasks, and independently and with full responsibility lead the most complex projects, to plan and implement scientific and / or applied research. They should learn to control work and evaluate the results of others in order to improve existing practice.

**Syllabus**

*Theoretical instruction:*

Introduction to project management. Basic concepts of projects. Teamwork and project management. Project documentation. Project planning for implementation. Implementation of the plan - realization of the project. Completing the project. Project Quality Measurement System. Organization for project management. IT supported project management.

*Practical teaching:*

Preparation of project documentation for project management (development: Logical project matrix, work plan, project budget, etc.). Analysis of case studies related to project management.

Seminar paper:

The student prepares project plan and documentation according to the rules of project management on a particular topic.

**Literature:**

1. Milutin R. Đuričić, i grupa autora, Upravljanje projektima, VPTŠ Užice, 2015,

Additional Literature:

1.Milutin R. Đuričić, Radomir Bojković, Projektni menadžment, ICIM plus, Kruševac, 2008,

2.P. Jovanović, Upravljanje projektima, FON, Beograd, 2006.

3. Internet, company documentation, personal or other experience from practice.

| **Number of active teaching classes: 60** | | | | Other classes: |
|---|---|---|---|---|
| Lectures: 2x15=30 | Practical classes: 2x15=30 | Other teaching forms: | Study research work: | |

**Teaching methods:** 1.Oral presentation, 2. Direct communication with students, 3. Text analysis, 4. Examples from practice, prospectuses, instructions and other demonstration materials,, 5. Discussion

**Knowledge evaluation (maximum 100 points)**

| **Pre-exam obligations** | **Points** | **Final exam** | **Points** |
|---|---|---|---|
| Activity during lectures | 10 | Written exam | 30 |
| Practical classes | 5 | Oral exam | |

| | | | |
|---|---|---|---|
| Colloquia | 40 | | |
| Seminar papers | 15 | | |
| **Assessment methods**: | | | |

**Study programme: OCCUPATIONAL SAFETY AND HEALTH**

**Type and Level of Studies: MASTER VOCATIONAL STUDIES**

**Course code and title: FIRE PROTECTION OF BUILDINGS**

**Teacher (Surname, middle initial, name):** Radomir M. Zejak

**Course status:** Compulsory

**Number of ECTS credits:** 6

**Prerequisites: no**

**Course aims:**

Acquisition of advanced specialized knowledge on the analysis of the position of a building construction site and its construction from the aspect of fire hazards. Estimation of the risk and vulnerability of buildings against fire hazards and application of constructional fire protection measures for buildings.

**Learning outcomes:**

Students should master the knowledge that enables them to solve complex problems in an innovative way, and to conceive and independently manage knowledge and skills related to the protection of buildings from fire hazard. Students should manage and guide complex communication, interaction and collaboration with others from different social groups. They should apply complex methods and software packages related to the protection of buildings from fire hazard. They should act as entrepreneurs and undertake managerial tasks, and independently and with full responsibility lead the most complex projects, plan and implement scientific and / or applied research. They should control the work and evaluate the results of others in order to improve existing practice.

**Syllabus**

Theoretical instruction:

Fire protection in the field of urban planning. Definition of fire hazard. Construction-related measures of protection, active and passive fire protection measures. Categorization of facilities. Fire resistance of building structures and construction materials. Fire load. Fire protection design concept (built-in protection measures). Fire hazard sectors (division of facilities into fire sectors, size, fire brigade sector boundaries). Fire hazard walls and doors. Stable fire alarm systems and fire extinguishers. Mobile devices and fire extinguishing equipment. Hydrants. Smoke protection of buildings from fire. Evacuation during a fire (escape routes, evacuation timing ...), Legislation on fire protection. Fire protection measures in performing welding, cutting and soldering.

Practical teaching:

Familiarizing students with examples from practice, getting acquainted with fire extinguishers and fire extinguishers.

**Literature:**

1. M. Isailović, Tehnički propisi o zaštiti od požara i eksplozija sa komentarima, SMEITS Beograd, 4. dopunjeno izdanje, 2007.
2. S. Milutinović, Zaštita zgrada od požara, Univerzitet u Nišu, 1997.
3. Applicable laws: Regulations and Laws on Fire Protection

| **Number of active teaching classes: 60** | | | | Other classes: |
|---|---|---|---|---|
| Lectures: 2x15=30 | Practical classes: 2x15=30 | Other teaching forms: | Study research work: | |

**Teaching methods:** Lectures, exercises, assignments, projects, and consultations.

**Knowledge evaluation (maximum 100 points)**

| **Pre-exam obligations** | **Points** | **Final exam** | **Points** |
|---|---|---|---|
| Activity during lectures | 10 | Written exam | |
| Practical classes | | Oral exam | 50 |
| Colloquia | | | |
| Seminar papers | 40 | | |

**Assessment methods**:

**Study programme: OCCUPATIONAL SAFETY AND HEALTH**

**Type and Level of Studies: MASTER VOCATIONAL STUDIES**

**Course code and title: ELECTROMAGNETIC RADIATION**

**Teacher (Surname, middle initial, name):** Vidoje N. Milovanović

**Course status:** Compulsory

**Number of ECTS credits:** 6

**Prerequisites: no**

**Course aims:**
Acquisition of advanced specialized knowledge about non-ionizing radiation, as well as the practical application of acquired knowledge.

**Learning outcomes:**
Students should master the knowledge that enables them to solve complex problems in an innovative way, and to conceive and independently manage knowledge and skills related to electromagnetic radiation. They should manage and guide complex communication, interaction and collaboration with others from different social groups. They should apply complex methods and software packages related to electromagnetic radiation. They should act as entrepreneurs and undertake managerial tasks, and independently and with full responsibility lead the most complex projects, plan and implement scientific and / or applied research. They should learn to control the work and evaluate the results of others in order to improve existing practice.

**Syllabus**
Theoretical instruction:
Electromagnetic radiation. Static electromagnetic fields. Electromagnetic fields of extremely low frequencies. Radiofrequency radiation. Microwave radiations. Optical radiation. Electromagnetic radiation of computers. Non-ionizing radiation in medicine. Electromagnetic radiation measurements. Standards. Processing of measurement results. Protection against non-ionizing radiation.
Practical teaching:
Laboratory practice: Measurement of static electric and magnetic fields. Measurement of electric and magnetic fields of extremely low frequencies. Measurement of radiofrequency radiation. Measuring of microwave radiations of microwaves, cell phones, and base stations of mobile telephony, Measuring of intensity of ultraviolet radiation and UV index. Analysis of radiofrequency and microwave spectrum radiation.

**Literature:**
1. Elektromagnetika, Branko Popović, Akademska misao, Beograd, 2004.
2. Elektrotehnika, Vidoje Milovanović, VPTŠ, Užice 2009.
3. Čovek u bliskom radiofrekvencijskom polju, Kemal Dervić, Podgorica, 2008.
4. Radiofrekvencijsko zračenje u okolini GSM baznih stanica, Branislav Vulević, Zadužbina Andrejević, Beograd, 2007.
5. Elektromagnetna zračenja, Vidoje Milovanović ,VPTŠ, Užice 2012.

| **Number of active teaching classes: 60** | | | | Other classes: |
|---|---|---|---|---|
| Lectures: 2x15=30 | Practical classes: 2x15=30 | Other teaching forms: | Study research work: | |

**Teaching methods:**

**Knowledge evaluation (maximum 100 points)**

| **Pre-exam obligations** | **Points** | **Final exam** | **Points** |
|---|---|---|---|
| Activity during lectures | 10 | Written exam | |
| Practical classes | 20 | Oral exam | 40 |
| Colloquia | 20 | | |
| Seminar papers | 10 | | |

**Assessment methods**:

**Study programme: OCCUPATIONAL SAFETY AND HEALTH**

**Type and Level of Studies: MASTER VOCATIONAL STUDIES**

**Course code and title: INFORMATICS RESEARCH METHODOLOGY**

**Teacher (Surname, middle initial, name):** Ljubica Ž. Diković, Milovan S. Milivojević

**Course status:** Compulsory

**Number of ECTS credits:** 6

**Prerequisites: no**

**Course aims:**

Acquisition of advanced specialized knowledge on modern methods of data collection in the field of research. Adopting theoretical background from mathematical statistics and competent use of appropriate software tools. Mastering the techniques of publishing the results from research work using advanced computer programs.

**Learning outcomes:**

Students should master the knowledge that enables them to solve complex problems in an innovative way. They should manage and lead complex communication, interaction and collaboration with others. Students should apply complex methods and software packages related to research methodology. They should act as entrepreneurs and undertake managerial tasks, and independently and with full responsibility lead the most complex projects, plan and implement scientific and / or applied research. They should learn how to control the work and evaluate the results of others in order to improve existing practice.

**Syllabus**

*Theoretical instruction:*

Collection of scientific and professional information in the field of research (Internet, academic network, SCI list, KOBSON, knowledge bases, scientific and professional journals and references ...). Collection of empirical data in the field of social and technical sciences. Theory of samples. Polls. Delphi method. Pareto method. Design Of Experiments. Optimization criteria. Elements of probability and statistics. Dispersion diagrams. Histograms. Normal distribution law. Empirical and theoretical distribution function. Dimensions and layouts. Regression and dispersion analysis. Correlation analysis. Variance Analysis (ANOVA). Statistical hypotheses and tests. Evaluation of confidence interval. Application of standard statistical data processing packages on a computer. Publication of research work. Content and structure of work. Designing and formatting with advanced software techniques.

*Practical teaching:*

Practical classes are carried out in the form of exercises and seminar work, which is related to the study program. In the course of the exercise, general and characteristic examples related to the chosen field of study are being processed. Seminar paper includes the study and detailed analysis of a specific s issue in the field of Occupational Safety and Health.

**Literature:**


1. M. Kundačina, V. Banđur, Akademsko pisanje, Učiteljski fakultet u Užicu, Užice, 2007.
2. Z. V. Popović, Kako napisati i objaviti naučno delo, Institut za fiziku, 2004.,Beograd
3. John Walkenbach, Excel 2007 Biblija , Mikro knjiga, 2007, Beograd
4. Petrović Ljiljana, Teorija uzoraka i planiranje eksperimenata, Ekonomski fakultet, Beograd, 2003
5. Petrović Ljiljana, Zbirka zadataka iz teorije uzoraka i planiranja eksperimenata, Ekonomski fakultet, Beograd, 2001


| **Number of active teaching classes: 60** | | | | Other classes: |
|---|---|---|---|---|
| Lectures:<br>2x15 = 60 | Practical classes:<br>2x15 = 60 | Other teaching forms: | Study research work: | |

**Teaching methods:** Classical teaching methods with the occasional use of video projectors and interaction with students. The exercises practically realize the exposed principles and analyze typical problems and their solutions.

| **Knowledge evaluation (maximum 100 points)** | | | |
|---|---|---|---|
| **Pre-exam obligations** | **Points** | **Final exam** | **Points** |

| | | | |
|---|---|---|---|
| Activity during lectures | 10 | Written exam | |
| Practical classes | 25 | Oral exam | 40 |
| Colloquia | | | |
| Seminar papers | 15-25 | | |
| **Assessment methods**: | | | |

**Study programme: OCCUPATIONAL SAFETY AND HEALTH**

**Type and Level of Studies: MASTER VOCATIONAL STUDIES**

**Course code and title: TRANSPORT SYSTEMS**

**Teacher (Surname, middle initial, name):** Dejan V. Vidojević

**Course status:** Compulsory

**Number of ECTS credits:** 6

**Prerequisites: no**

**Course aims:**

Acquisition of advanced specialized knowledge on the organization of materials supply, distribution of materials and finished products from the manufacturer to the hobbyist, storage, transport, inventory management, reception and ordering process.

**Learning outcomes:**

Students should master the knowledge that enables them to solve complex problems in an innovative way, and to conceive and independently manage systems for performing key logistical tasks with transport systems. They should manage and guide complex communication, interaction and collaboration with others from different social groups. Students should act as entrepreneurs and undertake managerial tasks, and independently and with full responsibility lead the most complex projects, plan and implement scientific and / or applied research. They should acquire knowledge to control the work and evaluate the results of others in order to improve existing practice.

**Syllabus**

*Theoretical instruction:*

Introduction to Transport Logistics. Transportation expenses. Transport management. Specificity of demand for transport services. Factors for the choice of transport type. Characteristics of the transport offer. Costs transport. Cost sharing according to their economic essence. The cost of transport service and the factors on which it depends. Basic way of organizing transport. Independent performance or rent of transport. Competitive advantages and disadvantages of transport. Road transport. Water transport. Air traffic. Pipelines. Transport devices for internal transport in production systems and warehouses. Analysis of the advantages and disadvantages of transport. Optimization in transport. Optimization of flows of goods. Types and characteristics of transport machines. Drives of the transport machines. Mechanisms of conveyor system drives in various types of cranes. Highway and portal lifts. Transport problem. Formation of a general model. Establishing an initial solution. Finding an optimal solution. Steeping Stone Method. Modified method. Practical application of criteria and methods. Definition of problems and modeling. An open transport problem. Pallets and containers - primary lines of integral transport. Technology vehicle - vehicle. Technology of combining land-sea and river-sea. Inventory management. Stock renewal interval. The level to which the stock is being filled. The economic size of the order. ABC analysis of inventory management. Storage Management. Number of warehouses. Storage location. Managing an ordering system in an enterprise. Processing of consumer orders. Information costs in the procedure of order processing.

*Practical teaching:*

Settings for practical examples. Solving tasks and analyzing results. Design of various types of cranes in internal transport. Interoperability transport. Distribution of raw materials and finished products. Warehouse space and work performance.

**Literature:**

1.Transportna logistika, elektronski zapis na CD, VPTŠ, Užice , ISBN 86-83573-03-6, jan. 2006.g,
2. Transportni sistemi,B.I.Damaskin i L.V. Kuznecov, Teška industrija, Moskva, 2004.
3. Pantelić T.: Industrijska logistika – Izdavački centar za industrijski menadžment, Kruševac, 2001.
4. Pantelić T.: Zbirka rešenih zadataka iz industrijske logistike sa izvodima iz teorije, ICIM – Izdavački centar za industrijski menadžment, Kruševac, 2005.

| **Number of active teaching classes: 90** | | | | Other classes: |
|---|---|---|---|---|
| Lectures: | Practical classes: | Other teaching forms: | Study research | |

| | | | | |
|---|---|---|---|---|
| 3x15=45 | 3x15 =45 | | work: | |
| **Teaching methods:** Oral presentation in combination with video. | | | | |
| **Knowledge evaluation (maximum 100 points)** | | | | |
| **Pre-exam obligations** | **Points** | **Final exam** | **Points** | |
| Activity during lectures | 10 | Written exam | 20 | |
| Practical classes | 10 | Oral exam | 10 | |
| Colloquia | 30 | | | |
| Seminar papers | 20 | | | |
| **Assessment methods**: | | | | |

**Study programme: OCCUPATIONAL SAFETY AND HEALTH**

**Type and Level of Studies: MASTER VOCATIONAL STUDIES**

**Course code and title: RISK MANAGEMENT AND RISK ASSESSMENT METHODS**

**Teacher (Surname, middle initial, name):** Marjanovic M. Vesna

**Course status:** Compulsory

**Number of ECTS credits:** 6

**Prerequisites: no**

**Course aims:**

Acquiring advanced specialized knowledge in the field of occupational health and safety for carrying out risk assessment work at workplace and work environment. Familiarizing students with risk assessment methods, legal directives, international standards and preventive measures for risk management.

**Learning outcomes:**

Students should master the knowledge that enables them to solve complex problems in an innovative way, and conceive and independently carry out risk assessments by looking at workplace and workplace activities, identifying possible hazards and harmfulness, calculating risk levels by applying appropriate methods, and applying appropriate preventive risk management measures. They should learn to control and risk management in order to improve existing practice.

**Syllabus**

*Theoretical instruction:*

European directives and national legislation in the field of safety and health at work. Occupational injuries, occupational diseases and work-related illnesses. Risk theory. Methods of risk assessment (quantitative, qualitative, semi-quantitative methods for risk assessment). Methodology for carrying out the risk assessment procedure. Risk management (management of technological and work processes, change management, material resource management, document management and records management, knowledge management). Harmonized standards.

*Practical teaching:*

Assessment of workplace and workplace risks for certain companies

**Literature:**

1. Neda Jocić, Vodič za procenu i upravljanje rizikom, Prof. dr Neda Jocić i „Futura“, Petrovaradin, 2008.
2. Jelena Starčević, Maja Ilić, Prim dr sci Jelena Paunović-Pfaf, Priručnik za procenu rizika, GLOBE DESIGN Beograd, 2010.
3. Prof. dr Radmila Drobnjak, mr Predrag Drobnjak, mr Vesna Petrović, dr Biljana Gemović, Upravljanje rizikom i metode procene rizika, Naučna KMD, Beograd, 2013.
4. Vera Božić-Trefalt, Simo Kosić, Božo Nikolić, Priručnik za polaganje stručnog ispita o praktičnoj osposobljenosti lica za obavljanje poslova bezbednosti i zdravlja na radu i poslova pregleda i ispitivanja opreme za rad i ispitivanja uslova radne okoline, Novi Sad, Visoka tehnička škola strukovnih studija, 2007.
5. Milutin Jelić i drugi, Bezbednost i zdravlje na radu – priručnik za pripremu stručnog ispita, Beograd, Tehpro, 2016.
6. A. Ian Glendon, Sharon Clarke, Eugene McKenna, Human Safety and Risk Management, CRC Press, 2006.

| **Number of active teaching classes: 60** | | | | Other classes: |
|---|---|---|---|---|
| Lectures:<br>2 x 15 = 30 | Practical classes:<br>2 x 15 = 30 | Other teaching forms: | Study research work: | |

**Teaching methods:** Oral presentations, illustrative examples, preparation of seminar paper

**Knowledge evaluation (maximum 100 points)**

| **Pre-exam obligations** | **Points** | **Final exam** | **Points** |
|---|---|---|---|
| Activity during lectures | 5 | Written exam | 50 |
| Practical classes | 5 | Oral exam | |
| Colloquia | 30 | | |
| Seminar papers | 10 | | |

**Assessment methods**:

**Study programme: OCCUPATIONAL SAFETY AND HEALTH**

**Type and Level of Studies: MASTER VOCATIONAL STUDIES**

**Course code and title: AIR QUALITY MONITORING AND MANAGEMENT**

**Teacher (Surname, middle initial, name):** Snežana M. Aksentijević

**Course status:** Compulsory

**Number of ECTS credits:** 6

**Prerequisites: no**

**Course aims:**
Acquisition of expert knowledge related to theory and principles, critical understanding and application in the field of air quality monitoring programs, qualitative and quantitative methods of analysis and risk assessment for safety and protection at work.

**Learning outcomes:**
Students can apply in theory the acquired theoretical and practical knowledge in solving complex problems in an innovative way, apply complex methods, instruments and devices relevant to the analysis of pollutants in the air, plan and implement scientific and / or applied research for air quality control and risk assessment exposure to increased concentrations of pollutants in the air.

**Syllabus**
*Theoretical instruction:*
Structure and composition of the atmosphere. Pollution of air, inorganic and organic pollutants, secondary pollutants, particulate matter in the air. Episodic and accidental air pollution. Regional and global impacts of air pollution and harmful effects of polluted air on human health and life. Pollution protection measures, monitoring of air quality in urban and industrial environments. Determination of air pollution, program and planning of air quality monitoring, duration of measurements and their frequency, emission and immission limit values, sampling methods. Air quality indexes. Indoor air pollution. Prevention of air pollution - changes in the production process, improvement of technologies, reduction of emissions of hydrocarbon, carbon dioxide, sulfur oxide and nitrogen. Devices, methods and processes for air purification. Legal regulations on air protection from pollution.
*Practical teaching:*
Qualitative and quantitative characterization of the most significant pollutants (CO, CO2, NOx, O3, H2S, SO2, Cl2 and particulate matter) emitted into the atmosphere. Interpretation of results. Analysis of air quality of the living and working environment.

**Literature:**
1.Zaštita životne sredine, Olivera Novitović, Dragiša Ranđić, Aleksandar Novitović VPTŠ UŽICE 2014 godina.
2.Developing performance indicators, Councilon th Council on the Cost of Government, Service Efforts and Accomplishments Environment, Sydney, 2000.
3. Ecological Monitoring & Assessment Network Coordinating Office, PerformanceMeasures, 2004-05
4. Air Monitoring for Toxic Exposures [Hardcover]Henry J. McDermott (Author), London 2010 year
5. Air Quality Compliance and Permitting Manual
6. Air Quality Compliance and Permitting Manual, McGraw-Hill Professional Publishing (2002)

| **Number of active teaching classes: 90** | | | | Other classes: |
|---|---|---|---|---|
| Lectures:<br>3 x 15 = 45 | Practical classes:<br>3 x 15 = 45 | Other teaching forms: | Study research work: | |

**Teaching methods:** Oral presentation. Demonstration of practical work, text processing, analysis of literature, laboratory work.

**Knowledge evaluation (maximum 100 points)**

| **Pre-exam obligations** | **Points** | **Final exam** | **Points** |
|---|---|---|---|
| Activity during lectures | 10 | Written exam | 40 |
| Practical classes | | Oral exam | 10 |

| | | | |
|---|---|---|---|
| Colloquia | 30 | | |
| Seminar papers | 10 | | |
| **Assessment methods**: | | | |

**Study programme: OCCUPATIONAL SAFETY AND HEALTH**

**Type and Level of Studies: MASTER VOCATIONAL STUDIES**

**Course code and title: WORKPLACE AND EQUIPMENT ERGONOMICS**

**Teacher (Surname, middle initial, name):** Radomir M. Zejak**,** Ivana M. Ćirović

**Course status:** Compulsory

**Number of ECTS credits:** 6

**Prerequisites: no**

**Course aims:** Acquisition of specialized professional knowledge related to the principles, methods and conditions of arrangement and equipping of the work space in such a way that the safety and health of the employee is not threatened, which is at the same time adapted to its anatomical, physiological and psychological characteristics and needs.

**Learning outcomes:**

Acquisition of advanced specialized knowledge on the evaluation and critical understanding of the relationship between man and workspace and solving complex problems in an innovative way. Acquisition of skill of managing and managing complex communication, interaction and cooperation with other professions in an interdisciplinary approach to addressing the relationship between man, workplace and space. Ability to independently and responsibly plan and realize the most complex design and equipping of work spaces adapted to the needs and work process and employees so as to increase safety, satisfaction, efficiency, and productivity in work.

**Syllabus**

*Theoretical instruction:*

Ergonomics in the prevention of occupational safety and health. Ergonomic measures in the Law on Safety and Health at Work. Modern preventive measures that minimize the risk of injuries and damage to the health of employees. The work environment, space and equipment adapted to the anatomical, physiological and psychological characteristics and needs of the employee so that they represent a stable and pleasant working environment that increases safety, satisfaction, efficiency and productivity in work.

Anthropological measures. Relationship: user - workplace. Process analysis - events. Workshop scheme. Multidisciplinary approach to the problem of the relationship between man and space: psychology, sociology, medicine. Dimensional properties of space and equipment. Schedule and position of workplaces in the room. Job link with other workplaces. Visual properties of spatial elements: colors, textures, shapes. Tactile properties of spatial elements. Surface treatment: floors, walls, ceilings. Doors and windows: size and position relative to the workplace. Typical organizations. Hierarchy of the environment. Spatial levels. Sphere of communication: intimate, personal, social and public. Multi-functionality of the space. National standards and norms for premises of different purposes: administrative and business buildings, hospitals and health centers, industrial buildings, agricultural buildings, traffic terminals, catering facilities, schools, etc. Spacious climate: visual, thermal, air, acoustic. Natural and artificial lighting workspace. Zone space within: working, communicative, auxiliary-hygienic and entrance zone.

*Practical teaching:*

Comparative theoretical analysis of jobs in working spaces for different purposes. Preparation of seminar paper on the given subject according to the given model and conceptual solution of the work space and equipment for the selected purpose and the given spatial conditions.

**Literature:**

1. Antropološke mere i enterijer, Panero, J., Zelnik, M. (2009). Beograd: Građevinska knjiga.
2. Oblikovanje unutrašnjeg prostora, Kojić, Đ. (2002), Novi Sad.
3. Dizajn enterijera, Gibs, Dž. (2010), Beograd: Don Vas
4. Uvod u projektovanje enterijera, Pitulić, N., Berić, B.. (2012). Beograd: Službeni glasnik.
5. Architecture and Identity:responses to cultural and technological change Chris, A.(2000)
6. Oxford,Periodika, Architectural Press: Architectural design, Domus, The Architectural Review

| **Number of active teaching classes: 60** | Other classes: |
|---|---|

| | | | | |
|---|---|---|---|---|
| Lectures:<br>2 x 15 = 30 | Practical classes:<br>2 x 15 = 30 | Other teaching forms: | Study research work: | |
| **Teaching methods:** Visual illustrated lectures, individual research work on a given topic according to the given model, workshops, discussions, conceptual solution of work space and equipment through individual consultations and corrections, evaluation of seminar papers. | | | | |
| **Knowledge evaluation (maximum 100 points)** | | | | |
| **Pre-exam obligations** | **Points** | **Final exam** | **Points** | |
| Activity during lectures | 5 | Written exam | 50 | |
| Practical classes | 10 | Oral exam | | |
| Colloquia | 10 | | | |
| Seminar papers | 20 | | | |
| **Assessment methods**: | | | | |

**Study programme: OCCUPATIONAL SAFETY AND HEALTH**

**Type and Level of Studies: MASTER VOCATIONAL STUDIES**

**Course code and title: SAFETY IN MANUFACTURING SECTOR**

**Teacher (Surname, middle initial, name):** Nataša Ćirović

**Course status:** Compulsory

**Number of ECTS credits:** 6

**Prerequisites: no**

**Course aims:**

Acquisition of advanced specialized knowledge necessary for the analysis of production systems from the point of view of safety and protection at work, including evaluation, critical understanding and application.

**Learning outcomes:**

Through this course, students gain the necessary knowledge to solve complex problems of representative processes that are most often represented in the field of production and generally ineconomy, in an innovative way that contributes to the development of safety and health protection of workers and a good basis for analyzing, managing and monitoring the results of the research on the impact of production systems on security and Health at Work. Students should manage and guide complex communication, interaction and collaboration with others from different social groups. They should apply complex methods, instruments and devices relevant to the field of security in production systems. Students should act as entrepreneurs and undertake managerial tasks, and independently and with full responsibility lead the most complex projects, plan and implement scientific and / or applied research. They should know how to control the work and evaluate the results of others in order to improve existing practice.

**Syllabus**

*Theoretical instruction:*

Introduction to production systems and their impact on safety and health at work. Criteria for assessing the health risks of workers in production systems. The selection of input elements of production systems (schemes of production process, production equipment, raw materials and auxiliary materials, energy, methods of material transport, macro and micro location) of importance for the safety and protection of workers' health. Determination of critical control points of typical production processes of metallurgy, metalworking, chemical, food industry, in terms of safety and health of workers.

Technological processes and threats to the working environment in: 1.Metalurgy (Production of iron, copper, aluminum and other metals); 2.Metal processing industry; 3. Chemical industry (Soap production; Paper production; Manufacture of paints and varnishes; Manufacture of plastics; Manufacture of rubber; etc.); 4. Industry of non-metal production (lime; cement; plaster; glass; etc.) 5. Food industry (production: meat, bread, soft and alcoholic beverages, milk and dairy products, etc.). Risk Analysis of Critical Control Points (HACCP); Application of protection measures and technical solutions in order to increase the level of safety of employees in production systems.

*Practical teaching:*

Case studies for individual production systems.

Practical work: independent development of the Act on the risk assessment and measures of technical and individual protection in the production system.

Practical instruction in production facilities: Visiting the production system and learning about the dangers, harmfulness and protection measures. Preparation of seminar paper.

**Literature:**

1. B. Anđelković, I. Krstić, Tehnološki procesi i životna sredina, Univerzitetski udžbenik, Jugoslovenski savez Društva inženjera i tehničara zaštite, Niš, 2002.
2. Ćosić I., Radaković N., Tehnološke osnove efektivne proizvodnje, Fakultet tehničkih nauka Novi Sad, 2004.
3. Swift K.G., Booker J.D., Process Selection, from design to manufacture, second edition, Butterworth Heinemann, 2003.
4. Kalajdžić M., Tehnologija mašinogradnje, Mašinski fakultet u Beogradu,
5. Đuričić R.M., i dr., Integrisani sistem menadžmenta u turizmu, VPTŠ, Užice, 2015.

| **Number of active teaching classes: 90** | Other classes: |
|---|---|

| | | | | |
|---|---|---|---|---|
| Lectures:<br>3x15=45 | Practical classes:<br>3x15=45 | Other teaching forms: | Study research work: | |
| **Teaching methods:** Oral presentations, demonstration of practical work, text processing, analysis of literature. | | | | |
| **Knowledge evaluation (maximum 100 points)** | | | | |
| **Pre-exam obligations** | **Points** | **Final exam** | **Points** | |
| Activity during lectures | 5 | Written exam | 50 | |
| Practical classes | 5 | Oral exam | | |
| Colloquia | 30 | | | |
| Seminar papers | 10 | | | |
| **Assessment methods**: | | | | |

**Study programme: OCCUPATIONAL SAFETY AND HEALTH**

**Type and Level of Studies: MASTER VOCATIONAL STUDIES**

**Course code and title: HAZARDOUS SUBSTANCES AND PROTECTION MEASURES**

**Teacher (Surname, middle initial, name):** Ljiljana M.Trumbulović

**Course status:** Compulsory

**Number of ECTS credits:** 6

**Prerequisites: no**

**Course aims:** Acquisition of advanced specialized knowledge on management techniques and processes of modification of hazardous substances. Application of this knowledge will reduce sources of hazardous substances formation. Also, allocation of useful substances will be possible as well as protection against dangerous substances.

**Learning outcomes:**

Students should master the knowledge that enables them to solve complex problems in an innovative way, and to conceive and independently manage hazardous substances and prescribe adequate protection measures. They should be able to manage and guide complex communication, interaction and collaboration with others from different social groups. Students should learn to apply complex methods, instruments and devices relevant to the field of hazardous substances and protection measures against them. They should know how to act as entrepreneurs and undertake managerial tasks, and independently and with full responsibility lead the most complex projects, plan and implement scientific and / or applied research. Student should be able to control the work and evaluate the results of others in order to improve existing practice.

**Syllabus**

*Theoretical instruction:*

Definition and principles of hazardous substances management. Production and trade of dangerous goods. Waste treatment methods of materials that have hazardous properties. Hazardous materials control. Explosive substances. Safety and protection against explosives. Flammable liquids and gases. Flammable gases and Liquids. Flammable solids and protection. Oxidizing substances and protective measures. Toxic and infectious substances. Safety and protection against toxic and infectious substances. Radioactive substances and protection. Corrosive substances and protection. Safety measures in road, rail and air transport of hazardous substances. Chemicals management and chemical safety management.

*Practical teaching:*

State of the preparation and processing of hazardous substances in Serbia. Industrial toxicology. Biocides. Pesticides. Analysis of hazardous substances in foodstuffs. Flammable and other substances. Traffic explosives. Transport of dangerous goods. Protection against hazardous substances. Preparation of the project task - method of work on the text, study of literature, practical experience.

**Literature:**


1. Lj.Trumbulović: Opasne materije i zaštita, pisana predavanja, VPTŠ, 2016.
2. Šimon Đarmati: Hemija opasnih materija, Viša politehnička škola, Beograd, 2006
3. Pravilnik o preventivnim merama za bezbedan i zdrav rad na radnom mestu, Službeni glasnik RS, br.21/09
4. Zakon o bezbednosti i zdravlju na radu, Službeni glasnik RS, br.101/2005
5. Zakon o prevozu opasnih materija, Službeni glasnik RS, br.36/2009
6. S.Grigorijev Munitlak, S.Spajić: Opasne i štetne materije, praktikum, Visoka tehnička škola, Novi Sad, 2012.


| **Number of active teaching classes: 90** | | | | Other classes: |
|---|---|---|---|---|
| Lectures: 3x15=45 | Practical classes: 2x15=30 | Other teaching forms: | Study research work: 1 x 15 = 15 | |

**Teaching methods:** Oral presentation, demonstration of practical work, analysis of literature.

**Knowledge evaluation (maximum 100 points)**

| **Pre-exam obligations** | **Points** | **Final exam** | **Points** |
|---|---|---|---|
| Activity during lectures | 5 | Written exam | 50 |

| | | | |
|---|---|---|---|
| Practical classes | 10 | Oral exam | |
| Colloquia | 25 | | |
| Seminar papers | 10 | | |
| **Assessment methods**: | | | |

**Study programme: OCCUPATIONAL SAFETY AND HEALTH**

**Type and Level of Studies: MASTER VOCATIONAL STUDIES**

**Course code and title: HYGIENE AND OCCUPATIONAL MEDICINE**

**Teacher (Surname, middle initial, name):** Petar V. Bulat

**Course status:** Compulsory

**Number of ECTS credits:** 6

**Prerequisites: no**

**Course aims:** The acquisition of specialized knowledge in the field of health care of the working population, health and safety at work. Improvement and preservation of the health of employees, as well as improvement of the working conditions in order to prevent injuries at work and occupational diseases, diseases related to work, preservation of the health of the radioactive population, ie elimination of professional risks.

**Learning outcomes:** Students have mastered the knowledge that enables them to solve complex problems in an innovative way, and to conceive and independently manage knowledge and skills related to occupational medicine. They manage and guide complex communication, interaction and collaboration with others from different social groups. They apply complex methods and software packages related to occupational medicine. They control the work and evaluate the results of others in order to improve existing practice.

**Syllabus**

*Theoretical instruction:*

Introduction to occupational medicine (1 class). Psychophysiology of work (2 classes). Ergonomics and importance of ergonomic solutions in modern business (2 classes). Working environment assessment (3 classes). Introduction to professional pathology (1 class). Injuries at work (2 classes). Professional illnesses and preventive measures (2 classes). Professional toxicology (6 classes). Professional lung disease (2 classes). Professional skin diseases ( 1 class). Professional malignancies (2 classes). Professional diseases caused by physical factors (2 classes). Radiological protection 2 (classes). General principles of work ability assessment (2 classes). Basic legislation in the field of occupational safety and health (2 classes). Basics of occupational safety and health at work (2 classes).

*Practical teaching:*

Collecting workplace data (Work history) (3 classes).Testing of physical capacities of the individual (3 classes). Testing of psychic capacities of the individual (3 classes). Workplace ergonomics (3 classes). Examination of working conditions I (3 classes). Testing (3 classes). Biological monitoring (3 classes). Introduction to the work and organization of the occupational medicine ambulance (3 classes). Examination of cases of professional poisoning (3 classes). Examination of a case of professional lung disease (3 times). Professional malignant disease diagnosis (3 classes), Procedure for assessing work ability (3 classes). Professional rehabilitation (3 classes). Radiological protection (3 classes). Occupational safety and health procedures (3 classes).

Seminars: Exposure estimation (3 classes), Risk assessment (3 classes), Measures for risk elimination (3 classes).

**Literature:**

1. Medicina rada-Vidaković i saradnici, CIBID. 200

| **Number of active teaching classes: 90** | | | | Other classes: |
|---|---|---|---|---|
| Lectures: 3x12=36 | Practical classes: 3x15=45 | Other teaching forms: 3x3=9 (seminar) | Study research work: | |

**Teaching methods:** Lectures, exercises, assignments, projects, and consultations.

**Knowledge evaluation (maximum 100 points)**

| **Pre-exam obligations** | **Points** | **Final exam** | **Points** |
|---|---|---|---|
| Activity during lectures | 3 | Written exam | 60 |
| Practical classes | 7 | Oral exam | |
| Colloquia | 20 | | |
| Seminar papers | 10 | | |

**Assessment methods**:

**Study programme: OCCUPATIONAL SAFETY AND HEALTH**

**Type and Level of Studies: MASTER VOCATIONAL STUDIES**

**Course code and title: INDUSTRIAL PRESSURE PLANTS AND INSTALLATIONS**

**Teacher (Surname, middle initial, name):** Damnjan D. Radosavljević

**Course status:** Elective

**Number of ECTS credits:** 7

**Prerequisites: no**

**Course aims:** Acquisition of advanced specialized knowledge on hazards and hazards in handling plants and installations under pressure as well as protection measures from them.

**Learning outcomes:**

Students have mastered the knowledge that enables them to solve complex problems in an innovative way, and to conceive and independently manage the dangers of courts and installations under pressure. They manage and guide complex communication, interaction and collaboration with others from different social groups. They apply complex methods, instruments and devices relevant to the field of drinking water preparation. Students act as entrepreneurs and take on managerial tasks, and independently and with full responsibility lead the most complex projects, plan and realize scientific and / or professional projects.

**Syllabus**

*Theoretical instruction:*

The concept and definition of vessels and installations under pressure. Division according to different comparison criteria. Heated and uncured pressurized vessels. Steam boilers, overheating steam and water heaters. Non-ferrous vessels, overhead and underground reservoirs. Mobile pressure vessels (car tanks, wagons, marine tanks). Portable tanks (containers, barrels, barrels and bottles). Measures of protection when working with plants and installations under pressure. Designation of pressurized vessels, materials for production of pressure vessels, types of pressure vessels. Calculation of vessels and installations under pressure. Armor of vessels and pressure installations. Working, measuring and safety fittings. Testing of reinforcement, vessels and pressure installations. Energo-fluids and technical gases.

*Practical teaching:*

Students work on two projects (pressurized plants), within whose oral defense they also present acquired theoretical knowledge. Also, they perform test tasks.

**Literature:**

1. Dušan Vitas, Milan Trbojević, Mašinski elementi 1. deo, " Naučna knjga", Beograd, više izdanja.
2. Stojan Sedmak, Elementi mašina i aparata, TMF, Beograd, više izdanja.
3. Slobodan Ivković, Mašinski elementi, priručnik za vežbe, RGF, 1988, 1995.
4. Milosav Ognjanović, Mašinski elementi, Mašinski fakultet, Beograd 2006.
5. Božidar Prstojević, Nenad Đajić, Merenje i regulacija prirodnog gasa, RGF. 1995.

| **Number of active teaching classes: 90** | | | | Other classes: |
|---|---|---|---|---|
| Lectures: 3x15=45 | Practical classes: 3x15=45 | Other teaching forms: | Study research work: | |

**Teaching methods:** Oral presentations

**Knowledge evaluation (maximum 100 points)**

| **Pre-exam obligations** | **Points** | **Final exam** | **Points** |
|---|---|---|---|
| Activity during lectures | 10 | Written exam | 30 |
| Practical classes | | Oral exam | 20 |
| Colloquia | 40 | | |
| Seminar papers | | | |

**Assessment methods**:

**Study programme: OCCUPATIONAL SAFETY AND HEALTH**

**Type and Level of Studies: MASTER VOCATIONAL STUDIES**

**Course code and title: SOIL QUALITY MONITORING AND MANAGEMENT**

**Teacher (Surname, middle initial, name):** Snežana M. Aksentijević

**Course status:** Elective

**Number of ECTS credits:** 7

**Prerequisites: no**

**Course aims:** Acquisition of expert knowledge related to theory and principles, critical understanding and application in the field of soil pollution, characteristics of pollutants, their behavior and transport in soil, and the dangers and risks arising from this for human safety and protection at work. Introducing students with the needs and procedures of soil protection.

**Learning outcomes:** Students should be trained to apply acquired theoretical and practical knowledge in solving complex problems in an innovative manner; to apply complex methods, instruments and devices relevant for monitoring the migration of pollutants in the soil; to plan and realize scientific and / or applied research for control, protection and remediation soil.

**Syllabus**

*Theoretical instruction*:

The formation of soil. Basic soil characteristics - physical, chemical and biological. Morphology of soil. Soil quality. Water, air and heat properties of the soil. Soil types. Sources of soil contamination. Natural and anthropogenic soil contamination. Degradation of soil. Pollution of soil from air, irrigation and floods. Pollution of soil with solid waste. Pollution of soil with pesticides. Pollution of soil using mineral and organic fertilizers. The impact of heavy metals on soil contamination. Urban-industrial polluters. Consequences of polluting substances on the safety and health of the living world. Soil protection - basic parameters of soil protection. Methods of sampling. Re-cultivation and soil remediation. Legislation.

*Practical teaching:*

Getting to know morphological properties of the soil. Experimental determination of physical properties of soil (mechanical composition, classification, specific mass-density, total porosity, capillary rise of water in soil, permeability of soil for water). Experimental determination of soil chemical properties (pH, carbonate content, nitrogen, phosphorus, potassium, salinity, humus content in the soil).

**Literature:**

1. O. Jovanović, zagađenje i zaštita zemljišta, Beogradska politehnika – visoka škola strukovnih studija, Beograd, 2012.
2. P. Sekulić, R. Kastori, V. Hadžić: Zaštita zemljišta od degradacije, Naučni institut za ratarstvo i povrtarstvo, Novi Sad, 2003.
3. A. Kostić: Inženjering zaštite životne sredine, Hemijski fakultet, Univerzitet u Beogradu, 2007.
4. T. Sofilić, Onečišćenje i zaštita tla, Metalurški fakultet, Sisak, Univerzitet u Zagrebu, 2014.
5. Š. Goletić, teški metali u okolišu, Mašinski fakultet, Zenica, Univerzitet u Zenici, 2005.

| **Number of active teaching classes: 90** | | | | Other classes: |
|---|---|---|---|---|
| Lectures:<br>3 x 15 = 45 | Practical classes:<br>3 x 15 = 45 | Other teaching forms: | Study research work: | |

**Teaching methods:** Oral presentations, illustrative explanations, seminar paper preparation, laboratory work.

**Knowledge evaluation (maximum 100 points)**

| **Pre-exam obligations** | **Points** | **Final exam** | **Points** |
|---|---|---|---|
| Activity during lectures | 10 | Written exam | 40 |
| Practical classes | | Oral exam | 10 |
| Colloquia | 40 | | |
| Seminar papers | | | |

**Assessment methods**:

**Study programme: OCCUPATIONAL SAFETY AND HEALTH**

**Type and Level of Studies: MASTER VOCATIONAL STUDIES**

**Course code and title: NOISE AND VIBRATION**

**Teacher (Surname, middle initial, name):** Miloje S. Ćetković

**Course status:** Elective

**Number of ECTS credits:** 7

**Prerequisites: no**

**Course aims:** Acquisition of advanced specialized knowledge in the field of noise and vibration control. Training students to solve specific problems in the working environment that create sources of noise and vibration through the identification and characterization of sources, as well as, the design of noise and vibration protection systems.

**Learning outcomes:**

Students should master the knowledge that enables them to solve complex noise and vibration problems in an innovative way, and to conceive and independently manage systems for: 1.Noise and vibration measurement. 2. Application of noise and vibration for diagnostic purposes. 3. Calculation of sound absorption and absorption of vibrations. 4. Calculation of sound insulation and vibration isolation. They should be able to manage and guide complex communication, interaction and collaboration with others from different social groups. They should apply complex methods, instruments and devices relevant to the field of noise and vibration. They should act as entrepreneurs and undertake managerial tasks, and independently and with full responsibility lead the most complex projects, plan and implement scientific and / or applied research. Students should learn to control the work and evaluate the results of others in order to improve existing practice.

**Syllabus**

*Theoretical instruction:*

Basic principles of vibration isolation. Vibro-absorption. Vibro-insulation. Calculation of the system for vibration isolation and absorption. Diagnostics of the state of machine systems by monitoring vibrations. Diagnostic Tools: FFT, CPB, Kepstrum, Envelop, Order Analysis. Noise level in the working environment. Noise sources and their characteristics. Models for forecasting noise in the braking area. Structure of the model. Noise control. Basic principles. Sound absorption and sound insulation. Elements and materials for noise control. Noise control. Folding of the source. Control on the transmission paths. Screens. Control at the receiving point. Application of personal protective equipment. Sound insulation and absorption, sound protection of buildings. Sound permeability of interlayer structures. Reduction of sound throughput. Calculation of the sound permeability of floating floors. Reducing noise by increasing the absorption of rooms. Design of sound protection of building elements, protection against noise of installations, noise of mechanical elements.

*Practical teaching:*

Solving computational tasks in the area of noise and vibration control. Accounting exercises monitor theoretical lessons and thus contribute to a better understanding of the material and complement the acquired knowledge.

**Literature:**


1. Cvetković, D., Praščević, M.: Buka i vibracije, Fakultet zaštite na radu u Nišu, Niš, 2005
2. Praščević, M., Cvetković, D.: Buka u životnoj sredini, Fakultet zaštite na radu u Nišu, Niš, 2005
3. Blagojević, Lj.: Životna sredina i zdravlje, Fakultet zaštite na radu u Nišu, Niš, 2012.


| **Number of active teaching classes: 90** | | | | Other classes: |
|---|---|---|---|---|
| Lectures: 3x15=45 | Practical classes: 3x15=45 | Other teaching forms: | Study research work: | |

**Teaching methods:** Oral presentations, calculation tasks, laboratory work, multimedia presentation and discussion with students.

**Knowledge evaluation (maximum 100 points)**

| **Pre-exam obligations** | **Points** | **Final exam** | **Points** |
|---|---|---|---|
| Activity during lectures | 10 | Written exam | 20 |

| | | | |
|---|---|---|---|
| Practical classes | | Oral exam | 20 |
| Colloquia | 2x15=30 | | |
| Seminar papers | 20 | | |
| **Assessment methods**: | | | |

**Study programme: OCCUPATIONAL SAFETY AND HEALTH**

**Type and Level of Studies: MASTER VOCATIONAL STUDIES**

**Course code and title: MODERN DRINKING WATER TREATMENT METHODS**

**Teacher (Surname, middle initial, name):** Vesna M. Marjanović

**Course status:** /Elective

**Number of ECTS credits:** 7

**Prerequisites: no**

**Course aims:**

Acquisition of advanced specialized knowledge on the conditions for hygienic correctness of drinking water and processing methods that enable the achievement and maintenance of the given water quality, starting from different types of natural waters.

**Learning outcomes:**

Students have mastered the knowledge that enables them to solve complex problems in an innovative way, and to conceive and independently manage systems for the treatment of drinking water. They are able to apply complex methods, instruments and devices relevant to the field of drinking water treatment. Student act as entrepreneurs and undertake managerial tasks, and independently and with full responsibility lead the most complex projects, plan and implement scientific and / or applied research. They are able to control the work and evaluate the results of others in order to improve existing practice.

**Syllabus**

*Theoretical instruction:*

Guidelines for healthy safe drinking water. Plans on the safety of drinking water. Standards of drinking water. Monitoring of drinking water. Quality parameters of natural waters. The hygienic correctness of the drinking water and the maximum permissible concentration of the impurity. Basic technological methods of drinking water treatment: separation methods, chemical methods, diffusion methods, disinfection of drinking water. Removal of specific organic and inorganic pollutants from drinking water.

*Practical teaching:*

Experimental determination of water quality parameters. In laboratory conditions, students learn about water treatment processes (they work on coagulation and flocculation, filtration exercises). Adsorption characteristics of adsorbents. During the course, students go on a visit to the plant for the treatment of drinking water.

In the seminar work on the given topic attention is given to methods of processing and presentation of results, study of literature and experiences from practice.

**Literature:**

1) Dalmacija B., Agbaba J., Klašnja M., Savremene metode u pripremi vode za piće, Prirodno matematički fakultat, Departman za hemiju, biohemiju i zaštitu životne sredine, Novi Sad, 2009

2) Crittenden J. C., Trussell R. R., Hand D. W., Howe K. J., Tchobanoglous G., Water Treatment: Principles and Design, John Wiley & Sons. Inc. 2012

3) Y. Li, K. Migliaccio, Water Quality Concepts, Sampling, and Analyses, CRC Press, 2010

| **Number of active teaching classes: 90** | | | | Other classes: |
|---|---|---|---|---|
| Lectures:<br>3 x 15 = 45 | Practical classes:<br>3 x 15 = 45 | Other teaching forms: | Study research work: | |

**Teaching methods:** Lectures, exercises, assignments, projects, and consultations.

**Knowledge evaluation (maximum 100 points)**

| **Pre-exam obligations** | **Points** | **Final exam** | **Points** |
|---|---|---|---|
| Activity during lectures | 5 | Written exam | 50 |
| Practical classes | 10 | Oral exam | |
| Colloquia | 25 | | |
| Seminar papers | 10 | | |

**Assessment methods**:

**Study programme: OCCUPATIONAL SAFETY AND HEALTH**

**Type and Level of Studies: MASTER VOCATIONAL STUDIES**

**Course code and title: PERSONAL PROTECTIVE EQUIPMENT**

**Teacher (Surname, middle initial, name):** Vesna M. Marjanović

**Course status:** Elective

**Number of ECTS credits:** 7

**Prerequisites: no**

**Course aims:**

To enable students to obtain advanced specialized expertise for personal protection of employees, including evaluation, critical understanding and application in the field of worker safety in performing various tasks.

**Learning outcomes:**

Student should be able to solve complex problems independently in an innovative manner that contributes to development in the field of workers protection in performing various jobs. They should know how to apply complex methods, instruments and devices relevant to the field of occupational health and safety. They should be able to control work and evaluates the results of others in order to improve existing practice.

**Syllabus**

*Theoretical instruction:*

Definition of term: personal protective equipment (PPE); personal protective funds and equipment (PPFE). Assessment of funds and equipment for personal protection at work. Use of personal protective funds and equipment. Law regulations related to (PPFE) (Law on Safety and Health at Work, Rulebook on Preventive Measures for Safe and Healthy Work in the Use of Personal Protective Funds and Equipment, Rules on Personal Protective Equipment and etc.). Hazards and harmfulness that require the use of personal protective equipment and / or personal protective funds. Types of personal protective equipment and funds. Personal protective equipment and funds for jobs requiring their use. Important health and safety requirements (General requirements for all personal protective equipment (PPE), Additional requirements common to several types of PPE, Additional specific requirements specific to certain risks). Technical documentation for PPFE (Declaration of Conformity; Sign of Conformity (1. CE marking of conformity, 2. Serbian symbol of conformity). Categories and types of PPFE.

*Practical teaching:*

Case studies related to PPFE. Development of independent work related to the selection of PPFE for specific business systems.

**Literature:**


1. Priručnik za primenu Pravilnika o ličnoj zaštitnoj opremi, Ministarstvo finansija i privrede Republike Srbije,Beograd, 2012,
2. Pravilnik o preventivnim merama za bezbedan i zdrav rad pri korišćenju sredstava i opreme za ličnu zaštitu na radu ("Sl. Glasnik RS", br. 92/2008).
3. Pravilnik o ličnoj zaštitnoj opremi ("Sl. Glasnik RS", br. 100/2011).
4. ttp://www.jobbgd.com/media/Sredstva%20i%20oprema%20za%20licnu%20zastitu%20na%20radu.pdf


| **Number of active teaching classes: 90** | | | | Other classes: |
|---|---|---|---|---|
| Lectures: 3x15=45 | Practical classes: 2x15=30 | Other teaching forms: | Study research work: 1x15=15 | |

**Teaching methods:** Lectures, exercises, assignments, projects, and consultations.

**Knowledge evaluation (maximum 100 points)**

| **Pre-exam obligations** | **Points** | **Final exam** | **Points** |
|---|---|---|---|
| Activity during lectures | 10 | Written exam | 30 |
| Practical classes | 10 | Oral exam | |
| Colloquia | 40 | | |

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|---|---|---|---|
| Seminar papers | 10 | | |
| **Assessment methods**: | | | |

**Study programme: OCCUPATIONAL SAFETY AND HEALTH**

**Type and Level of Studies: MASTER VOCATIONAL STUDIES**

**Course code and title: SAFETY DURING CONSTRUCTION AND OCCUPATION OF BUILDINGS**

**Teacher (Surname, middle initial, name):** Boško B.Furtula

**Course status:** /Elective

**Number of ECTS credits:** 7

**Prerequisites: no**

**Course aims:** To enable students to acquire advanced specialized expertise in security of the construction and occupation of buildings, including valuation, critical understanding and application in the field of workers' safety in carrying out various tasks and tasks.

**Learning outcomes:**

Student should be able to independently solve complex problems in an innovative way that contributes to development in the field of protection of workers from security in the construction and use of buildings. This should be possible through complex communication, interaction and collaboration with others from different social groups. Students should be able to apply complex methods, instruments and devices relevant to the field of occupational health and safety. They should controls the work and evaluates the results of others in order to improve existing practice

**Syllabus**

*Theoretical instruction:*

Concept and definitions of specific measures and norms of occupational safety applicable to the execution of construction works. Measures and norms of protection at work: 1. Construction site design, 2. Ground works, 3. Work platform and ladders (auxiliary supports), 4. Protection from falling across the edge and sloping into openings, 5. Masonry works, 6. Vertical ladders with back and climbing, 7. Construction of factory chimneys and the concept of work at altitude, 8. Storage of cut material and assortments, 9. Carpentry works, 10. Pieces approach, passes and ramps, 11. Working floors, 12. Protective rail, 13. Work scaffolds, 14. Bearing scaffolds, 15. Hanging scaffolding, 16. Protective scaffolds, 17. Works near traffic, 18. Production of pre-stressed concrete elements, 19. Armored Works, 20. Concrete Works, 21. Works on the Roof, 22. Prefabricated Building, 23. Demolition of buildings, 24. Construction of roads, 25. Construction of bridges, 26. Carpentry works, 27. Finishing of ready-made piles, 28. Drawing of drafts, gates and diaphragms, 29. Installation device for ready-made concrete supports, 30. Protection measures for work at altitude, 31. Tunneling works. 32. Mining works, 33. Work with construction machinery, 34. Cranes and material and equipment transfer, 35. Transport of materials and equipment, 36. Temporary electrical installation, 37. Hazardous substances Protection measures for the use of constructed buildings.

*Practical teaching:*

Case studies related to safety in the construction and use of buildings. Creation of independent work related to safety in the construction and use of construction objects.

**Literature:**

Basic:

1. Materijal za pripremu za polaganje stručnog ispita za obavljanje poslova koordinatora za izradu projekta i koordinatora za izvođenje radova, Ministarstvo rada i socijalne politike, Beograd, 2010.
2. Ćirović G.: Problemi planiranja, organizacije i tehnologije građenja, Viša građevinsko-geodetska škola, Beograd, 2005.
3. Arizanović, D., Tehnologija građevinskih radova, Univerzitet u Beogradu, 1997
4. Normativi i standardi rada u građevinarstvu, Niskogradnja 6, IRO Građevinska knjiga, Beograd, 1982.
5. Trbojević, Organizacija građevinskih radova, Građevinska knjiga, 1980.

Additional:

1. Zakonski propisi (veb sajt Skupštine Republike Srbije http://www.parlament.gov.rs/akti/doneti-zakoni/doneti-zakoni.1033.html, veb sajt Službenog glasnika http://www.slglasnik.com/ i
2. veb sajt ostalih propisa http://www.paragraf.rs/) 2. Standardi (veb sajt Instituta za standardizaciju Srbije:

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|---|---|---|---|---|
| www.iss.rs) | | | | |
| **Number of active teaching classes: 90** | | | | Other classes: |
| Lectures:<br>3x15=45 | Practical classes:<br>3x15=45 | Other teaching forms: | Study research work: | |
| **Teaching methods:** Lectures, exercises, assignments, projects, and consultations. | | | | |
| **Knowledge evaluation (maximum 100 points)** | | | | |
| **Pre-exam obligations** | **Points** | **Final exam** | **Points** | |
| Activity during lectures | 10 | Written exam | 30 | |
| Practical classes | 10 | Oral exam | | |
| Colloquia | 40 | | | |
| Seminar papers | | | | |
| **Assessment methods**: | | | | |

**Study programme: OCCUPATIONAL SAFETY AND HEALTH**

**Type and Level of Studies: MASTER VOCATIONAL STUDIES**

**Course code and title: TECHNOLOGY SYSTEMS AND WORK EQUIPMENT SAFETY**

**Teacher (Surname, middle initial, name):** Dejan Vidojević

**Course status:** Elective

**Number of ECTS credits:** 7

**Prerequisites: no**

**Course aims:** Acquisition of specialized knowledge from technological systems in order to minimize their impact on the work and environment, whose ultimate goal is improvement and preservation of the health of employees, as well as improvement of working conditions in order to prevent injuries at work and occupational diseases, diseases related to work, preserving the health of active working population and elimination of professional risks

**Learning outcomes:**
Students have mastered the knowledge that enables them to solve complex problems in an innovative way, and to conceive and independently manage knowledge and skills related to technological systems and safety of work equipment. They should be able to manage and lead complex communication, interaction and collaboration with others from different social groups. Students should be able to apply complex methods and software packages related to technological systems and safety of work equipment. They should control the work and evaluate the results of others in order to improve existing practice.

**Syllabus**
*Theoretical instruction:*
Basic concepts and definitions related to technological systems and safety of work equipment. Technologies. Production technology system. Technological service system. Technological processes. Basic technological operations. Basic processes. Division of technological processes. Schemes of technological processes. Analysis of technological processes. Open cycles of technological processes. Technological processes as a source of pollution. Measures for reducing the level of risk. Principles of pollution elimination at the site of formation. Safe job design. Stable systems. Mobile systems. Hermetization of processes. Dilution of pollution. Pollution purification. Closed cycles of technological processes. Neglecting technology, principles: improvement of technological processes, recycling, regeneration and recuperation, utilization. Assessment of technology from the point of view of work and environment protection: best available techniques, technological forecasts. Application of protection measures and technical solutions in order to increase the level of security of technological systems. Automation and humanization of labor. Mechanization of labor resources.
*Practical teaching:*
Case studies related to technological systems and safety of equipment for work (manufacturing, process industry, non-industry, etc.)
Other forms of teaching: Self-preparation of seminar paper. It was planned to visit two to three business systems in order to familiarize students with security systems of technology and systems.

**Literature:**
1.Anđelković, B., Krstić, I.: Tehnološki procesi i životna sredina, Fakultet zaštite na radu, Niš, 2002.
2.Trbojević, N.: Procesi standardizacije u proizvodnim sistemima, Mašinski fakultet, Banja Luka, 2003.

| **Number of active teaching classes: 90** | | | | Other classes: |
|---|---|---|---|---|
| Lectures:<br>45 = 3x15 | Practical classes:<br>45 = 3x15 | Other teaching forms: | Study research work: | |

**Teaching methods:** Lectures, exercises, assignments, projects, and consultations.

**Knowledge evaluation (maximum 100 points)**

| **Pre-exam obligations** | **Points** | **Final exam** | **Points** |
|---|---|---|---|
| Activity during lectures | 10 | Written exam | 30 |
| Practical classes | 10 | Oral exam | |
| Colloquia | 40 | | |

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|---|---|---|---|
| Seminar papers | 10 | | |
| **Assessment methods**: | | | |

**Study programme: OCCUPATIONAL SAFETY AND HEALTH**

**Type and Level of Studies: MASTER VOCATIONAL STUDIES**

**Course code and title: SAFETY IN TOURISM INDUSTRY**

**Teacher (Surname, middle initial, name):** Radmila Novaković Kostić

**Course status:** Elective

**Number of ECTS credits:** 7

**Prerequisites: no**

**Course aims:** Acquiring knowledge and skills from different aspects of security in tourism. Students will comprehensively acquire knowledge about potential risks and security challenges in modern tourism. They will learn how to solve complex problems related to preventive but also adequate response (response) in crisis situations (risk to the life and health of tourists, and endangering tourist facilities). Their knowledge will be applicable at the level of individual holders of the tourist offer, as well as at the level of an integral tourist product or destination.

**Learning outcomes:**
Students have mastered the knowledge that enables them to solve complex problems in an innovative way, to conceive and independently manage the necessary level of security in tourism activities within the economic and political environment. Students are trained to solve different types of crises and safety risks of tourism characteristics, the application of adequate measures at both levels of tourism product (individual and integral) with a special emphasis on the application of tourism communications in crisis conditions.

**Syllabus**

*Theoretical instruction:*

The concept of security; types of crises and risks in tourism (terrorist attacks, kidnapping and hostage situations, food poisoning, aircraft, road and rail accidents, fires in a tourist facility and destination, floods, earthquakes, infectious diseases, political crisis, violent change of power ...); tourism and criminal activities (forms of threats to public safety specific to tourism), tourism and terrorism; safety at the level of tourist destinations, safety in catering, safety at tourist and cultural manifestations and events, safety during tourist trips; changes in the macromarketing environment, the tourism market and trends in modern tourism of significance for security;

*Practical teaching:*

Explanation and practical examples of theoretical teaching. Case studies. Creation and defense of seminar papers.

**Literature:**

1. Instrumenti za komunikaciju u uslovima krize u turizmu (2012), Ministarstvo ekonomije i regionalnog razvoja/prirediola Svetska turistička organizacija UNWTO, Beograd
2. Smernice za upravljanje kriznim situacijama u turizmu (2007), dokumenat Svetske turističke organizacije u publikaciji «Upravljanje turističkim destinacijama», Univerzitet Singidunum, Beograd
3.Bezbednost hrane – primena HACCP sistema u ugostiteljstvu i hotelijerstvu; J. Popov-Raljić i I. Blešić **I**PMF, DGTH, Novi Sad, 2012.

| **Number of active teaching classes: 90** | | | | Other classes: |
|---|---|---|---|---|
| Lectures:<br>3 x 15=45 | Practical classes:<br>3 x 15=45 | Other teaching forms: | Study research work: | |

**Teaching methods:** verbal (use of computers, projectors and presentations, methods of problem expositions, group discussions, etc.), visual (analysis of graphic and written documentation, analysis of specific cases), consultative - instructive teaching, presentation and group analysis of seminar papers, textual and graphically illustrated methods using video presentations.

**Knowledge evaluation (maximum 100 points)**

| **Pre-exam obligations** | **Points** | **Final exam** | **Points** |
|---|---|---|---|
| Activity during lectures | 10 | Written exam | |
| Practical classes | 10 | Oral exam | 50 |

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|---|---|---|---|
| Colloquia | 20 | | |
| Seminar papers | 10 | | |
| **Assessment methods**: | | | |