

SAFETY AT WORK IN THE LABORATORY	
GENERAL INFORMATIONS	
Course coordinator	Prof. Ivica Mihaljević, MD, PhD
Assistant/Associate	Assoc. Prof. Damir Gugić, MD, PhD Asst. Prof. Ilijan Tomaš, MD, PhD Asst. Prof. Tomislav Kizivat, MD, PhD
Study Programme	Undergraduate University Study of Medical Laboratory Diagnostics
Status of the course	mandatory
Year of study, semester	1 st year, 1 st semester
ECTS	3
Workload (hours)	Lectures: 30; Seminars: 10
Expected number of students	35
COURSE DESCRIPTION	
Course objectives	
Objective of this core course is to offer students the possibility to gain knowledge on health risks present when working in various specialized laboratories, on self-protection, general safety and environmental protection procedures applicable to laboratory work, and to gain knowledge on basic first aid procedures.	
Enrolment requirements and entry competencies	
None.	
Learning outcomes at the programme level	
1.1, 2.2, 2.5, 2.6, 3.2	
Learning outcomes at the course level	
After completing lectures, seminars and exercises, following independent studying and passing the exam, students will be able to: <ol style="list-style-type: none"> 1. Explain biological and chemical hazards. 2. Explain the principles of protection against exposure to chemical substances and chemicals. 3. Interpret the principles of protection against exposure to biological agents. 4. Explain environmentally friendly methods for disposal of hazardous materials. 5. Explain the principles of protection against exposure to radioactive substances. 6. Gain knowledge on the use of personal protective equipment in the laboratory. 7. Gain knowledge on fire safety. 8. Identify critical events such as asphyxiation, or gas and corrosive substance poisoning. 9. Gain knowledge on giving first aid in cases of laboratory accidents. 	
Course content	
<p>Lectures: Chemical hazards. Basic terms in toxicology. Poison absorption routes and absorption prevention. Protection against exposure to chemical substances: toxic, flammable, corrosive, reactive, cancerogenic and incompatible substances. Protection against potentially infectious biological material. Disposal of hazardous materials. Occupational diseases affecting laboratory workers. Legal responsibility with regard to safety, self-protection and environmental protection. European guidelines on hazardous substances and reduction of the use of hazardous substances. Introduction to occupational health and safety. Occupational health and safety for healthcare workers. Hazards in laboratory work: hazard types and classification. Work space and environment: microclimatic working conditions (ventilation, heating, work space lighting). Medical instruments and devices. Electricity. Harmful radiation in medical practice. Personal protective equipment. Protection against radioactive substances. Fire safety. Biological hazards. Other hazard sources in the laboratory: compressed gases, cryogenic materials, mechanical injuries. Liquefied and compressed gases. Equipment required for occupational health and safety in laboratories. Laboratory accident documentation and investigation. Significance of medical examinations for healthcare workers. Giving first aid in cases of laboratory</p>	

accidents. Documentation pertaining to hazardous substances. Emergency plan. Hazard and risk assessment. Organization and communication. Special technical accident prevention measures. Emergency response. Decontamination and first aid in case of exposure to chemical substances.

Seminars: Legal responsibility with regard to safety, self-protection and environmental protection. European guidelines on hazardous substances and reduction of the use of hazardous substances. Personal protective equipment. Other hazard sources in the laboratory: compressed gases, cryogenic materials, mechanical injuries. Liquefied and compressed gases. Equipment required for occupational health and safety in laboratories. Laboratory accident documentation and investigation. Significance of medical examinations for healthcare workers. Giving first aid in cases of laboratory accidents.

Course delivery methods

Lectures and seminars.

Students' responsibilities

Student is required to regularly attend and actively participate in all course delivery forms. In order to be able to successfully present their seminar papers, the students are required to prepare in advance.

Monitoring students' work (Connecting learning outcomes, teaching methods and evaluation)

Examination: written exam.

Teaching activity	ECTS	Learning outcome	Student activity	Assessment methods	Grade points	
					Min.	Max.
Attending classes	1.5	1-10	Class attendance, seminar paper	Attendance records, seminar paper presentation	5	10
					15	40
Final exam	1.5	1-10	Studying for the final exam	Written exam	30	50
Total	3				50	100

Evaluation of written part of final exam:

Percentage of correct answers (%)	Grade points
60.00-64.99	30
65.00-69.99	33
70.00-74.99	36
75.00-79.99	39
80.00-84.99	42
85.00-89.99	45
90.00-94.99	47
95.00-100	50

Calculation of the final grade:

Grade points earned in the final exam are added to the grade points earned in course classes. Grading is done by absolute distribution, i.e. based on overall result. Grades are numerically expressed as follows:

A – excellent (5): 80-100 grade points ; B – very good (4): 70-79.99 grade points; C – good (3): 60-69.99 grade points; D – sufficient (2): 50-59.99 grade points

Required reading (available in the library and through other media)		
Title	Number of copies in the library	Availability through other media
Dodig D, Kusić Z. Klinička nuklearna medicina. Second revised and updated edition. Course textbook. Zagreb, Medicinska naklada 012.	9	
Plavšić F. et al. Siguran rad s kemikalijama, Zagreb; 2006.		
ZIRS: Sigurnost pri radu za radnike u zdravstvu, Zagreb; 2001.		
Further reading		
1. Išgum-Vorgić Lj. Zaštita na radu u laboratoriju. Course booklet. Zagreb; 2003. 2. Plavšić F. et al. Temeljni pojmovi iz toksikologije, Zagreb; 1999.		
Course evaluation procedures		
Anonymous, quantitative, standardised student survey on the course and the teacher's work implemented by the Quality Improvement Office of the Faculty of Medicine Osijek.		