

Course: Health Ecology
Head: Vladimir Mićović, MD. PhD., Full Professor
Chair: Department of Environmental Health
Studij: Integrated Undergraduate and Graduate University Study of Medicine
Study year: 5.
Academic year 2021./2022.

IMPLEMENTATION CURRICULUM

Information about the course (short description of the course, general instructions, where and in what form the classes are organized, necessary equipment, instructions about attending and preparing for classes, student obligations, etc.):

The course **Health Ecology** is a compulsory course in the 5th year of the Integrated Undergraduate and Graduate University Study of Medicine. The course consists of 20 hours of lectures, 15 hours of seminars and 15 hours of exercises, a total of 50 hours of teaching (2.5 ECTS). It is held at the Faculty of Medicine and in lecture halls and laboratories in the main facility of the Institute of Public Health of Primorje-Gorski Kotar County. Krešimirova 52a.

Course objective Students will acquire knowledge to understand the relationship between health and disease in relation to the negative effects of the environmental factors.

Teaching

Classes are held in shifts, daily for two weeks. Every day there are 2 hours of lectures and 3 hours of seminars and 3 hours of exercises.

List of required examination literature:

1. M. Kaštelan Macan, M. Petrović: Kemija okoliša, HINUS i FKIT, 2013
2. Valić F. Zdravstvena ekologija, Medicinski fakultet Sveučilišta u Zagrebu, Zagreb, 2001

List of additional literature:

1. C. Baird: Environmental Chemistry, 2 Ed., W.F. Friedman & Comp, 2003
2. R. Beaglehole, R. Bonita, T. Kjellstrom: Basic Epidemiology, WHO Geneva, 1993
3. Bilješke s predavanja

Curriculum:

List of lectures (with titles and explanations):

L1, L2 Introduction, Ecology, ecosystems: structure and function, Biogeochemical cycle

Learning outcomes

Students will be introduced to the content of the course, literature and the method of assessment.
To define the structure and function of ecosystems and explain the role of elements in the biochemical cycle.

L3, L4 Human impact on ecosystems. Transport of pollutants

Learning outcomes

To define the factors that affect the mode of spread and the lifespan of pollutants in the environment and state the causes of environmental pollution.

L5, L6 Traffic and its impact to health

Learning outcomes

To define pollutants originating from traffic and to explain their effects on human health and list ways we can reduce traffic pollution.

L7, L8 Environmental factors and their effects on the environment and man

Learning outcomes

To list the most common groups of chemical compounds - pollutants (metals, chlorinated hydrocarbons, polycyclic aromatic hydrocarbons) and to explain their effects in the environment.

L9, L10 Ecogenetics

Learning outcomes

To explain the effect of pollutants on genetic material and to describe the methods of genotoxicity testing material.

L11, L12 Health - ecological aspects of nutrition

Learning outcomes

To explain eating habits and the importance of nutrition for human health, to understand the problems of proper modern nutrition, to understand the nutritional profile of food and the physiologically functional ingredients of food.

L13, L14 Health aspects of the environment, assessment of health effects of environmental factors

Learning outcomes

To list and to describe aspects of the urban / work environment that have a proven impact on both human health and quality of life, and to identify and to explain the effects of environmental factors.

L15, L16 Ecological concept of health, global health-ecological problems, Ecological toxicology, environment and cancer

Learning outcomes

To explain the main ecological aspects of health, both locally and globally. To state the effect of ecological toxicology and research objectives with emphasis on environmental factors contributing to the development of different form of cancer.

L17, L18 Health care programs

Learning outcomes

To identify programs of measures in the field of health care.

L19, L20 Quality of life in the environment

Learning outcomes

To define and identify those aspects of research of environmental factors that directly affect the maintenance of quality of life in the immediate work and / or ambient environment.

List of seminars with explanation:

S1, S2 Air

To list the chemical characteristics of clean and polluted atmosphere, local and global air pollution problems and to explain the impact of air pollution on the environment and human health.

S3, S4 Waters in nature

To explain the concept of water circulation in nature, phases of the hydrological cycle, distribution of water on earth. To define the types of water used as sources of drinking water, their origin, basic characteristics and methods of use.

S5, S6 Wastewaters

To list the types and sources of water pollution in nature and water for human consumption. To define types of wastewater (municipal, industrial, precipitation, cooling), wastewater quality indicators (physical, chemical, biological). To describe the methods of wastewater treatment (stages of treatment - levels of treatment) and introduction to the drainage system.

S7, S8 Waste

To define the generation and distribution of medical waste, to explain the risks to health due to improper management of the same, and the ways of its proper disposal.

S9, S10 Food

To list the individual ingredients of foods and to list the chemical methods for their determination.

S11-S13 Articles of general use

To list the harmful substances that can be found in items of general use and explain how they are being controlled.

S14, S15 Nutrition and health

To list the types of foods and food ingredients and to explain their impact on the growth, development and maintenance of organisms as well as the diseases which can occur due to improper, insufficient or excessive intake of certain nutrients.

List of exercises with explanation:

E1, E2 Air quality control methods

E3, E4 Drinking water control

E5-E7 Wastewater control

E8-E10 Microbiological control of food and the environment

E11-E13 Control of foodstuffs and articles of general use

E14, E15 An overview of analytical techniques used in environmental analysis

During the exercises students will be presented to the performance of analytical procedures for determining the parameters that are the basis for the assessment of safety of drinking water, the level of organic and inorganic pollutants in water, determination of the parameters on the basis of which the microbiological and chemical safety of food and general use items are assessed as well as the physico-chemical methods of air pollution monitoring, method of their collection, processing and presentation to the public.

Student obligations:

Students are required to attend regularly and to actively participate in all forms of classes. A student that has not fulfilled his / her obligations prescribed by the study program if he / she has missed more than 30% of teaching hours of all forms of teaching (lectures, seminars, exercises) according to the Ordinance on student assessment at the Medical Faculty in Rijeka. According to the recommendation of the University, the student can reject a positive grade on the exam, but must sign specific form accepting an insufficient grade with one of the three possible exams used. The colloquium can also be repeated but the date of the corrective colloquium will be after the first exam period.

Exam (method of taking the exam, description of the written / oral / practical part of the exam, method of scoring, grading criteria):

Complete evaluation system

Activity	Share of ECTS credits	Learning outcomes	Student's activity	Assessment methods	Max. No. Of evaluation points
Class attendance	1,7				
Continuous assessment (colloquium)	0,2	P1-P10 S1-S6	1 colloquium	Points on the midterm exam are converted into grade points.	50
Final exam	0,6	P1-P20 S1-S15	Oral exam	Answers are scored	50
IN TOTAL	2,5				100

ECTS credit grading system:

Student assessment is carried out according to the current Rulebook on Studies at the University of Rijeka and according to the Ordinance on student assessment at the Medical Faculty in Rijeka (adopted by the Faculty Council of the Medical Faculty in Rijeka on June 12, 2018).

Student work is evaluated and graded during classes and at the final exam. Out of a total of 100 points, during the classes the student can achieve 50 points and 50 points at the final exam.

Student assessment is performed using ECTS (A-F) and number system (1-5). Assessment in the ECTS system is performed according to the assessment criteria from the Decision on Amendments to the Rulebook on Studies of the University of Rijeka, Article 29.

Of the maximum 50 grade points that can be achieved during the course, student must collect a minimum of 50% and more, grade points out of the grade points that could be obtained during the course as well as through forms of continuous monitoring and evaluation of students. In accordance with the rules and / or study program this student can access the final exam. Student who achieved from 0 to 49.9% of grades during classes, out of the grades that could be obtained during classes through forms of continuous monitoring and evaluation of students, in accordance with the rules and / or study program are graded F (unsuccessful), cannot acquire ECTS credits and must re-enrol in the course.

A student may miss 30% of classes due to health reasons, which is justified by a medical certificate. Attendance at lectures is mandatory. If a student justifiably or unjustifiably misses more than 30% of classes, he / she cannot continue following the course and loses the opportunity to take the final exam.

I. During classes, the following is evaluated (maximum up to 50 points):

a) obligatory written colloquium (up to 50 points) - the threshold of passing the colloquium is 50% and points for the solved test below the threshold are not given. The written colloquium consists of 26 questions and is written after the first week of classes. Table 1 shows the conversion of correct answers on the colloquium into points.

Table 1. Converting the correct answers on the colloquium into points

Number of correct answers on the Colloquium	Points
13	25
14	27
15	29
16	31
17	33
18	35
19	37
20	39
21	41
22	43
23	45
24	47
25	49
26	50

Final exam (up to 50 grades)

The final exam is oral and is scored with a maximum of 50 points. The exam threshold at the final exam cannot be less than 50% of the successfully passed exam.

Evaluation	Points
Sufficient (2)	25-31
Good (3)	32-38
Very good (4)	39-45
Excellent (5)	46-50

The final grade is formed in such a way that the points achieved in the final exam are added to the grade points achieved during the classes. Student assessment based on final achievement, is performed as follows:

Criterion	Numerical grade	ECTS grade
90 - 100%	5 (excellent)	A
75 - 89,9%	4 (very good)	B
60 – 74,9%	3 (good)	C
50 - 59,9%	2 (sufficient)	D
0 - 49,9%	1 (insufficient)	F

Possibility of teaching in a foreign language:

Yes, English.

Other notes (related to the course) important for students:

As seminars and exercises in Health Ecology take place in three groups (A, B and C), look at the schedule by groups behind the class schedule.

CLASS SCHEDULE IN HEALTH ECOLOGY BY GROUPS

Date	Date and place	Lectures	Seminars	Exercises	Teacher
May 31 2022	8:00-10:00 MF, P1	L1, L2			Vladimir Mićović, PhD, Full Professor
	10:00 -12:00 Institute 5 th floor/3 rd floor		S1,S2 (A)	V1,V2(A)	Dijana Linšak, PhD, Assistant Professor
June 1, 2022	8:00-11:00 MF, P1	L3, L4			Dražen Lušić, PhD, Associate Professor
June 2, 2022	8:00-11:00 MF, P2	L5, L6, L7, L8			Aleksandar Bulog, PhD, Associate Professor
June 3, 2022	8:00-10:00 MF, P2	L9, L10			Aleksandar Bulog, PhD, Associate Professor
	10:00-12:00 Institute 5 th floor/3 rd floor		S1,S2 (B)	V1,V2(B)	Dijana Linšak, PhD, Assistant Professor
	12:00-14:00 Institute 5 th floor/3 rd floor		S1,S2 (C)	V1,V2(C)	Dijana Linšak, PhD, Assistant Professor
June 6, 2022	14:00-16:00 MF, P2	L11, L12			Dražen Lušić, PhD, Associate Professor
	10:00-12:00 Institute 5 th floor/3 rd floor		S3,S4(A)	V3,V4(A)	Dražen Lušić, PhD, Associate Professor
	12:00-14:00 Institute 5 th floor/3 rd floor		S3,S4(B)	V3,V4(B)	Dražen Lušić, PhD, Associate Professor
June 7, 2022	8:00-10:00 MF, P1	L13, L14			Dražen Lušić, PhD, Associate Professor
	10:00-12:00 Institute 5 th floor/3 rd floor		S3,S4(C)	V3,V4(C)	Dražen Lušić, PhD, Associate Professor
	12:00-14:00 Institute 5 th floor/3 rd floor		S5,S6(A)	V5-V7(A)	Dražen Lušić, PhD, Associate Professor
June 8, 2022		-			Dražen Lušić, PhD, Associate Professor
	10:00-12:00 Institute 5 th floor/3 rd floor		S5,S6(B)	V5-V7(B)	Dražen Lušić, PhD, Associate Professor
	12:00-14:00 Institute 5 th floor/3 rd floor		S5,S6(C)	V5-V7(C)	Dražen Lušić, PhD, Associate Professor
	14:00-16:00 Institute 5 th floor/3 rd floor		S7,S8(A)	V8-V10(A)	Luka Traven, PhD, Associate Professor / Dražen Lušić, PhD, Associate Professor
June 9, 2022	8:00-10:00 MF, P2	L15, L16			Aleksandar Bulog, PhD, Associate Professor
	10:00-12:00 Institute 5 th floor/3 rd floor		S7,S8(B)	V8-V10(B)	Luka Traven, PhD, Associate Professor / Dražen Lušić, PhD, Associate Professor
	12:00-14:00 Institute 5 th		S7,S8(C)	V8-V10(C)	Luka Traven, PhD, Associate Professor / Dražen Lušić, PhD,

	floor/3 rd floor				Associate Professor
	14:00-14:45 3 rd floor 14:45-15:30 15:30-16:15			V14-15 Group A Group B Group C	Igor Dubrović, PhD
June 10, 2022	8:00-10:00 MF, P2	L17, L18			Aleksandar Bulog, PhD, Associate Professor
	10:00-12:00 Institute 5 th floor/3 rd floor		S9-12 (A)	V11- V13 (A)	Sanja Klarić, MSc
	12:00-14:00 Institute 5 th floor/3 rd floor		S9-12 (B)	V11- V13 (B)	Sanja Klarić, MSc
June 13, 2022	8:00-10:00 MF, P2	L19, L20			Aleksandar Bulog, PhD, Associate Professor
	10:00-12:00 Institute 5 th floor/3 rd floor		S9-12 (C)	V11- V13 (C)	Sanja Klarić, MSc
	12:00-12:45 Institute 5 th floor/3 rd floor		S13-15 (C)		Dražen Lušić, PhD, Associate Professor
	12:45-13:30 Institute 5 th floor/3 rd floor		S13-15 (A)		Dražen Lušić, PhD, Associate Professor
	13:30-14:15 Institute 5 th floor/3 rd floor		S13-15 (B)		Dražen Lušić, PhD, Associate Professor

List of lectures, seminars and exercises:

	LECTURES (lecture topic)	Number of teaching hours	Venue
L1, L2	Introduction, Ecology, ecosystems: structure and function, Biogeochemical cycle	2	Faculty of Medicine, P2
L3, L4	Human impact on ecosystems	2	Faculty of Medicine, P2
L5, L6	Traffic and its impact to health; Transport of pollutants	2	Faculty of Medicine, P2
L7, L8	Environmental factors and their effects on the environment and man	2	Faculty of Medicine, P2
L9, L10	Ecogenetics	2	Faculty of Medicine, P2
L11, L12	Health - ecological aspects of nutrition	2	Faculty of Medicine, P2
L13, L14	Health aspects of the environment, assessment of health effects of environmental factors	2	Faculty of Medicine, P2
L15, L16	Ecological concept of health, global health-ecological problems, Ecological toxicology, environment and cancer	2	Faculty of Medicine, P2
L17, L18	Health care programs	2	Faculty of Medicine, P2
L19, L20	Quality of life in the environment	2	Faculty of Medicine, P2
	Total hours of lectures	20	

	SEMINARS (seminar topic)	Number of teaching hours	Venue
S1, S2	Air	2	Institute, 5 th floor
S3, S4	Waters in nature	2	Institute, 5 th floor
S5, S6	Wastewaters	2	Institute, 5 th floor
S7, S8	Waste	2	Institute, 5 th floor
S9, S10	Food	2	Institute, 5 th floor
S11, S12	Articles of general use	2	Institute, 5 th floor
S13-S15	Nutrition and health	3	Institute, 5 th floor
	Total hours of seminars	15	

	Exercises (seminar topic)	Number of teaching hours	Venue
E1, E2	Air quality control methods	2	Institute, Lab. 3 rd floor
E3, E4	Drinking water control	2	Institute, Lab. 3 rd floor
E5-E7	Wastewater control	3	Institute, Lab. 3 rd floor
E8-E10	Microbiological control of food and the environment	3	Institute, Lab. 3 rd floor
E11-E13	Control of foodstuffs and articles of general use	3	Institute, Lab. 3 rd floor
E14, E15	An overview of analytical techniques used in environmental analysis	2	Institute, Lab. 3 rd floor
	Total hours of exercises	15	

	EXAM DATES (final exam)
1.	June 20, 2022
2.	July 8, 2022
3.	September 5, 2022
4.	September 19, 2022