[Medicinski fakultet u Rijeci]

Curriculum
2023/2024

[Za kolegij]

Health Ecology

Study program:	**Medical Studies in English (R)** [Sveučilišni integrirani prijediplomski i diplomski studij]
Department:	**[Katedra za zdravstvenu ekologiju]**
Course coordinator:	**izv. prof. dr. sc. Tomić Linšak Dijana, dipl. sanit. ing.**
Year of study:	**5**
ECTS:	**2.5**
Incentive ECTS:	**0 (0.00%)**
Foreign language:	**Possibility of teaching in a foreign language**

Course information:

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 Primorsko-Goranska County, Krešimirova 52a.

Course objective

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

Teaching

Classes are held in shifts, daily for two weeks. Every day there are 20 hours of lectures and 15 hours of seminars and 15 hours of exercises.

List of assigned reading:

1. M. Kaštelan Macan, M. Petrović: Kemija okoliša, HINUS i FKIT, 2013

2. Valić F. Zdravstvena ekologija, Medicinski fakultet Sveučilišta u Zagrebu, Zagreb,2001

3. Priručnik za studente medicine Medicinski fakultet Sveučilišta u Rijeci, Rijeka, 2022: https://repository.uniri.hr/islandora/object/medri:7284

List of optional reading:

Curriculum:

[Predavanja] list (with titles and explanation):

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

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.

The lectures will be given by the course leader Dijana Tomić Linšak, PhD, Associate Professor

L3, L4 Human impact on ecosystems. Transport of pollutants

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.

The lectures will be given by the course leader Dijana Tomić Linšak, PhD, Associate Professor

L5, L6 Traffic and its impact on health

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

The lectures will be given by the Associate professor Aleksandar Bulog, PhD

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

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

The lectures will be given by the course leader Associate Professor Dijana Tomić Linšak, PhD

L9, L10 Ecogenetics

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

The lectures will be given by the Associate Professor Aleksandar Bulog, PhD

L11, L12 Health - ecological aspects of nutrition

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.

The lectures will be given by the Assistant Professor Gordana Kenđel Jovanović, PhD

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

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

The lectures will be given by the Associate Professor Dražen Lušić , PhD

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

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 a different form of cancer.

The lectures will be given by the Associate Professor Aleksandar Bulog, PhD

L17, L18 Health care programs

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

The lectures will be given by the Associate Professor Iva Sorta Bilajac Turina, MD, PhD

L19, L20 Quality of life in the environment

To define and identify those aspects of research of environmental factors that directly affect the maintenance of the

quality of life in the immediate work and/or ambient environment.

The lectures will be given by the Associate Professor Iva Sorta Bilajac Turina, MD, PhD

[Seminari] list (with titles and 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.

The seminar will be given by the course leader Dijana Tomić Linšak, Assosciate Professor, PhD

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.

The seminar will be given by the Assosciate Professor Dražen Lušić, PhD

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), and 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.

The seminar will be given by the Assosciate Professor Dražen Lušić, PhD

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.

The seminar will be given by the Assosciate Professor Luka Traven, PhD

S9, S10 Food and food safety

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

The seminar will be given by the Assistant Professor Gordana Kenđel Jovanović, PhD

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.

The seminar will be given by the Assistant Professor Gordana Kenđel Jovanović, PhD

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.

The seminar will be given by the Assistant Professor Gordana Kenđel Jovanović, PhD

[Vježbe] list (with titles and explanation):

E1, E2 Air quality control methods

During the exercises, students will be presented with the performance of analytical procedures for determining the parameters that are the basis for the assessment of the 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 physicochemical methods of air pollution monitoring, method of their collection, processing, and presentation to the public.

The exercises will be given by the course leader Dijana Tomić Linšak, Assosiate Professor, PhD

E3, E4 Drinking water control

During the exercises, students will be presented with the performance of analytical procedures for determining the parameters that are the basis for the assessment of the 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 physicochemical methods of air pollution monitoring, method of their collection, processing, and presentation to the public.

The exercises will be given by the Associate Professor, Dražen Lušić, PhD

E5-E7 Wastewater control

During the exercises, students will be presented with the performance of analytical procedures for determining the parameters that are the basis for the assessment of the 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 physicochemical methods of air pollution monitoring, method of their collection, processing, and presentation to the public.

The exercises will be given by the Associate Professor, Dražen Lušić, PhD

E8-E10 Microbiological control of food and the environment

During the exercises, students will be presented with the performance of analytical procedures for determining the parameters that are the basis for the assessment of the 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 physicochemical methods of air pollution monitoring, method of their collection, processing, and presentation to the public.

The exercises will be given by the Associate Professor, Dražen Lušić, PhD

E11-E13 Control of foodstuffs and articles of general use

During the exercises, students will be presented with the performance of analytical procedures for determining the parameters that are the basis for the assessment of the 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 physicochemical methods of air pollution monitoring, method of their collection, processing, and presentation to the public.

The exercises will be given by Sanja Klarić, M.sc

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

During the exercises, students will be presented with the performance of analytical procedures for determining the parameters that are the basis for the assessment of the 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 physicochemical methods of air pollution monitoring, method of their collection, processing, and presentation to the public.

The exercises will be given by the Assistant Professor, Igor Dubrović, PhD

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 a 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 (exam taking, description of the written/oral/practical part of the exam, point distribution, grading criteria):

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 up to 5 % points, and 95% points in the final exam. A student may miss 30% of classes due to health reasons, which is justified by a medical certificate. Student assessment is performed using ECTS (A-F) and the 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 5 grade points that can be achieved during the course by regural class attendance, a student can earn a maximum of 95 grade points on the final exam, . 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. In accordance with the rules and/or study program this student can access the final exam.

I. During classes, the following are evaluated (maximum up to 5 grade points):

Table 1. Converting regural class attendance into grade points

0-16 hours	0 points
17-28 hours	2,5 points
29-35 hours	5 points

Final exam (up to 95 grade points)

The final exam is oral and is scored with a maximum of 95 points. The exam threshold at the final exam cannot be less than 50% of the successfully passed exam.

Evaluation of the final exam		
Scoring correct answers on the final exam	Points	Grade
Correct answer to 90-100% of the questions asked	85,5-95	Exellent (5)
Correct answer to 75-89.9% of the questions asked	71,5-85	Very good (4)
Correct answer to 60-74.9% of the questions asked	57-71	Good (3)
Correct answer to 50-59.9% of the questions asked	48-56,5	Sufficient

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:

Final grade		
Crietrion	Numerical grade	ECTS grade
A (90-100%)	Excellent (5)	A
B (75-89,9%)	Very good (4)	B
C (60-74,9%)	Good (3)	C

D (50-59,9%)	Sufficient (2)	D
F (0-49,9%)	Insufficient (1)	F

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

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

COURSE HOURS 2023/2024

Health Ecology

[Predavanja] (Place and time or group)	**[Vježbe]** (Place and time or group)	**[Seminari]** (Place and time or group)
27.05.2024		
L1, L2 Introduction, Ecology, ecosystems: structure and function, Biogeochemical cycle: • [/] (08:00 - 10:00) [1310] ○ HE_403	E1, E2 Air quality control methods: • [P21 NZZJZ, Lab. III kat] (11:00 - 13:00) [1310] ○ HE_403	S1, S2 Air: • [/] (10:00 - 12:00) [1310] ○ HE_403
izv. prof. dr. sc. Tomić Linšak Dijana, dipl. sanit. ing. [1310]		
28.05.2024		
L3, L4 Human impact on ecosystems. Transport of pollutants: • [/] (08:00 - 11:00) [1310] ○ HE_403		
izv. prof. dr. sc. Tomić Linšak Dijana, dipl. sanit. ing. [1310]		
29.05.2024		
L5, L6 Traffic and its impact on health: • [/] (08:00 - 10:00) [412] [1310] ○ HE_403		
izv. prof. dr. sc. Bulog Aleksandar, mag. sanit. ing. [412] · izv. prof. dr. sc. Tomić Linšak Dijana, dipl. sanit. ing. [1310]		
31.05.2024		
L9, L10 Ecogenetics: • [/] (08:00 - 10:00) [412] ○ HE_403 L7, L8 Environmental factors and their effects on the environment and man: • [/] (08:00 - 09:00) [1310] ○ HE_403		
izv. prof. dr. sc. Bulog Aleksandar, mag. sanit. ing. [412] · izv. prof. dr. sc. Tomić Linšak Dijana, dipl. sanit. ing. [1310]		
03.06.2024		
L9, L10 Ecogenetics: • [/] (08:00 - 10:00) [412] ○ HE_403 L11, L12 Health - ecological aspects of nutrition: • [/] (14:00 - 16:00) [1745] ○ HE_403	E3, E4 Drinking water control: • [P21 NZZJZ, Lab. III kat] (10:00 - 11:00) [1323] ○ HE_403 • [P21 NZZJZ, Lab. III kat] (11:00 - 12:00) [1323] ○ HE_403 E14, E15 An overview of analytical techniques used in environmental analysis: • [/] (16:00 - 17:00) [417] ○ HE_403	S3, S4 Waters in nature: • [/] (10:00 - 11:00) [1323] ○ HE_403 • [/] (11:00 - 12:00) [1323] ○ HE_403
izv. prof. dr. sc. Bulog Aleksandar, mag. sanit. ing. [412] · nasl. doc. dr. sc. Dubrović Igor, dipl. sanit. ing. [417] · doc. dr.sc. Kenđel Jovanović Gordana, dipl. ing. preh. bioteh. [1745] · izv. prof. dr. sc. Lušić Dražen, dipl. sanit. ing. [1323]		
04.06.2024		

L13, L14 Health aspects of the environment, assessment of health effects of environmental factors:
• [/] (08:00 - 10:00) [1323]
  ◦ HE_403
	E5-E7 Wastewater control:
	• [P21 NZZJZ, Lab. III kat] (12:00 - 13:30) [1323]
	  ◦ HE_403
	
	E14, E15 An overview of analytical techniques used in environmental analysis:
	• [/] (14:00 - 15:00) [417]
	  ◦ HE_403
		S5, S6 Wastewaters:
		• [/] (10:00 - 12:00) [1323]
		  ◦ HE_403

nasl. doc. dr. sc. Dubrović Igor, dipl. sanit. ing. [417] · izv. prof. dr. sc. Lušić Dražen, dipl. sanit. ing. [1323]		
05.06.2024		

	E5-E7 Wastewater control:
	• [P21 NZZJZ, Lab. III kat] (10:00 - 11:30) [1323]
	  ◦ HE_403
	
	E8-E10 Microbiological control of food and the environment:
	• [P21 NZZJZ, Lab. III kat] (12:00 - 13:30) [1323]
	  ◦ HE_403
	• [P21 NZZJZ, Lab. III kat] (13:30 - 15:00) [1323]
	  ◦ HE_403
		S7, S8 Waste:
		• [/] (08:00 - 10:00) [415]
		  ◦ HE_403

izv. prof. dr. sc. Lušić Dražen, dipl. sanit. ing. [1323] · prof. Traven Luka, dipl. ing. [415]		
06.06.2024		

L17, L18 Health care programs:
• [/] (08:00 - 10:00) [1765]
  ◦ HE_403
	E11-E13 Control of foodstuffs and articles of general use:
	• [/] (14:00 - 16:00) [416]
	  ◦ HE_403
		S9, S10 Food and food safety:
		• [/] (10:00 - 12:00) [1745]
		  ◦ HE_403
		
		S11-S13 Articles of general use:
		• [/] (12:00 - 14:00) [1745]
		  ◦ HE_403

doc. dr.sc. Kenđel Jovanović Gordana, dipl. ing. preh. bioteh. [1745] · nasl. asistentica, mr.sc. Klarić Sanja, dipl. sanit. ing. [416] · nasl. prof. dr. sc. Sorta-Bilajac Turina Iva, dr. med. [1765]		
07.06.2024		

L19, L20 Quality of life in the environment:
• [/] (08:00 - 10:00) [1765]
  ◦ HE_403
		S14, S15 Nutrition and health:
		• [/] (10:00 - 11:30) [1745]
		  ◦ HE_403
		• [/] (11:30 - 13:00) [1745]
		  ◦ HE_403

doc. dr.sc. Kenđel Jovanović Gordana, dipl. ing. preh. bioteh. [1745] · nasl. prof. dr. sc. Sorta-Bilajac Turina Iva, dr. med. [1765]		

List of lectures, seminars and practicals:

[PREDAVANJA] (TOPIC)	Number of hours	Location

L1, L2 Introduction, Ecology, ecosystems: structure and function, Biogeochemical cycle	2	[/]
L3, L4 Human impact on ecosystems. Transport of pollutants	2	[/]
L5, L6 Traffic and its impact on health	2	[/]
L7, L8 Environmental factors and their effects on the environment and man	2	[/]
L9, L10 Ecogenetics	2	[/]
L11, L12 Health - ecological aspects of nutrition	2	[/]
L13, L14 Health aspects of the environment, assessment of health effects of environmental factors	2	[/]
L15, L16 Ecological concept of health, global health-ecological problems, Ecological toxicology, environment and cancer	2	
L17, L18 Health care programs	2	[/]
L19, L20 Quality of life in the environment	2	[/]

[VJEŽBE] (TOPIC)	Number of hours	Location
E1, E2 Air quality control methods	2	[P21 NZZJZ, Lab. III kat]
E3, E4 Drinking water control	2	[P21 NZZJZ, Lab. III kat]
E5-E7 Wastewater control	3	[P21 NZZJZ, Lab. III kat]
E8-E10 Microbiological control of food and the environment	3	[P21 NZZJZ, Lab. III kat]
E11-E13 Control of foodstuffs and articles of general use	3	[/]
E14, E15 An overview of analytical techniques used in environmental analysis	2	[/]

[SEMINARI] (TOPIC)	Number of hours	Location
S1, S2 Air	2	[/]
S3, S4 Waters in nature	2	[/]
S5, S6 Wastewaters	2	[/]
S7, S8 Waste	2	[/]
S9, S10 Food and food safety	2	[/]
S11-S13 Articles of general use	3	[/]
S14, S15 Nutrition and health	2	[/]

EXAM DATES (final exam):

1.	17.06.2024.
2.	08.07.2024.
3.	19.08.2024.
4.	06.08.2024.