Faculty of Medicine in Rijeka

Curriculum
2024/2025

For course

Epidemiology

Study program:	**Medical Studies in English (R)** University integrated undergraduate and graduate study
Department:	**Department of Social Medicine and Epidemiology**
Course coordinator:	**prof. prim. dr. sc. Kolarić Branko, dr. med.**
Year of study:	**5**
ECTS:	**3.5**
Incentive ECTS:	**0 (0.00%)**
Foreign language:	**Possibility of teaching in a foreign language**

Course information:

Epidemiology is a compulsory course in the 5th year of the Integrated undergraduate and graduate university study of Medicine in English held in the twelfth semester. It comprises 30 hours of lectures, 15 hours of seminars, and 15 hours of practicals, totaling 60 class hours (3.5 ECTS credits).

The aim of the course is to prepare the students for professional jobs and tasks based on the acquired knowledge of epidemiology, as they will participate as doctors of medicine in the control and prevention of diseases (primary, secondary and tertiary prevention of communicable and chronic mass diseases). It implies knowledge of the foundations of the epidemiological characteristics of communicable and chronic mass diseases, understanding disease prevention and control measures, and anti-epidemic measures and their role in these affairs,

Course content: students will be introduced to the organization and functioning of the epidemiological service and the ways sanitary-epidemiological unit communicate with other healthcare teams, primarily in the field of early alerting and reporting of diseases and health conditions, on-scene interventions, population screening programs, sampling, and other disease control and prevention measures in the population. Students will be familiarized with the epidemiology of infectious and non-infectious diseases and statistical data processing in epidemiology.

COURSE LEARNING OUTCOMES:

I. COGNITIVE DOMAIN – KNOWLEDGE

Students will:

• be trained for future participation in the epidemiological information system

• be familiarized with their obligations under the Law on the Protection of the Population from Infectious Diseases

• be able to identify unusual groupings or epidemics of diseases and other unexpected events

• be able to identify risk factors for diseases in their patients and apply general measures to prevent mass diseases

• be able to recognize the importance of prevention measures such as vaccination and early detection of chronic mass diseases in the population

• be able to explain preventive and anti-epidemic disinfection, disinsection and deratization

• acquire basic knowledge of interventional epidemiology, epidemiological diagnostics, chemoprophylaxis, and seroprophylaxis

• be able to apply this knowledge in practical work.

II. PSYCHOMOTOR DOMAIN – SKILLS

In classes, students will demonstrate the calculation of measures of association and measures of occurrence in epidemiological data processing, which they will be able to apply and perform later in their practice. Knowledge of basic scientific-analytical epidemiology, epidemiological methods, and epistemology of epidemiology will serve students as a basis for future scientific work (critical analysis of knowledge, interpretation of bias in research, analysis of research limitations).

Teaching: The course is taught at the Faculty of Medicine, University of Rijeka and the Institute of Public Health of the Primorje-Gorski Kotar County. Lectures, seminars, and practicals are conducted using a PowerPoint presentation. Seminars and practicals require active student participation. Students must prepare in advance for certain practical and seminar classes

The student is required to prepare the material being discussed concerning attitudes toward vaccination. Students will be divided into two groups, one of which will advocate against vaccination and the other for vaccination. The debate will be mentored by the teacher. Attitudes for/against vaccination will be supported by data from professional and scientific literature.

The teacher evaluates student participation during seminar classes (demonstrated knowledge, comprehension, problem-solving skills, reasoning, etc.). The teacher assesses student participation during seminar and practical classes, as well as connection and synthesis of prior knowledge adopted in previous lectures. Students should explain and substantiate a particular topic being covered.

List of assigned reading:

1. Gordis L. Epidemiology. 6th edition. Elsevier Saunders. 2018.

2. Heyman DL. Control of Communicable Diseases Manual. American Public Health Association.

List of optional reading:

1. Rothman JK, Greenland S, Lash TL. Modern Epidemiology. Lippincot Williams and Wilkins. 2012.

Curriculum:

Lectures list (with titles and explanation):

Lecture 1. Introduction to epidemiology. Historical development of epidemiology.

Familiarizing with the basic terms and concepts from epidemiology: definition of epidemiology, definition of epidemic, endemic and pandemic, the difference between theoretical and interventional epidemiology. Understanding the historical context in the development of modern epidemiology, primarily the vaccine development, health surveillance of human food and drinking water, and aseptic techniques.

Lecture 2. Descriptive epidemiology. Measures of occurrence. Direct and indirect data standardization.

Acquiring basic principles of descriptive epidemiology. Understanding epidemiological variables (person, place, time). Creating an epidemic curve. Seasonal and secular trends. Identifying differences in indicators of morbidity and mortality rate (incidence, prevalence, mortality, lethality). Acquiring knowledge about comparing data on populations of different (age) structures. Choosing the correct method of data standardization by age (direct and indirect data standardization).

Lecture 3. Analytic epidemiology. Measures of association. Epidemiological study design. Sources of bias in population studies

Acquiring definitions and goals of analytical epidemiology. Ability to calculate and interpret basic measures of association (relative risk, attributable risk, odds ratio). Understanding the level of evidence of epidemiological studies and the cause-and-effect relationship. Understanding the basic principles of analytical studies in epidemiology: cohort, case-control, and cross-sectional studies. Distinguishing the advantages and disadvantages of different epidemiological studies. Selecting the optimal study design depending on the type of epidemiological problem, existing knowledge, and the prevalence of the researched phenomenon. Acquiring knowledge about the basic types of bias in research (random, systemic, confounding) and interpreting personal and literature research work considering potential bias and research limitations.

Lecture 4. Diagnostic tests – sensitivity/specificity, predictive value. Epidemiology of chronic mass diseases – introduction. Cardiovascular diseases. Neoplasms. Diabetes.

Interpreting diagnostic test characteristics (sensitivity, specificity, positive and negative predictive value, determination of the cut-off value in a diagnostic test). Familiarizing with the basic epidemiological principles in the occurrence of chronic mass diseases, risk factors, and measures of primary, secondary, and tertiary prevention of chronic diseases. Acquiring knowledge about epidemiological monitoring of chronic mass diseases, sources of information, morbidity and mortality in Croatia. Understanding cardiovascular diseases: incidence, age distribution and prevention measures. Distinguishing between variable and invariable risk factors for the development of cardiovascular diseases. Distinguishing the effectiveness of individual preventive activities and understanding the problem of suppressing the most common risk factors for the development of cardiovascular disease. Understanding malignant diseases: incidence, age and gender distribution, prevention measures. Identifying genetic and environmental risk factors for neoplasms. Familiarizing with the Cancer Registry. Interpreting the incidence of diabetes in the world and in the Republic of Croatia, analyzing risk factors, chronic complications, and prevention measures.

Lecture 5. Information systems and interventional epidemiology. Epidemiology of HIV and blood-borne diseases. Post-exposure prophylaxis. Nosocomial infections.

Describing the information flow in the epidemiological service. Understanding how intervention measures in epidemiology are created. Acquiring knowledge about epidemiological principles in the occurrence and spread of sexually transmitted and blood-borne diseases, their morbidity, as well as prevention and antiepidemic measures on examples of diseases from this group (HIV/AIDS and viral hepatitis). Familiarizing with the procedure in the case of occupational exposure to and prophylaxis for blood-borne diseases. Acquiring knowledge about procedures for control and suppression of nosocomial infections. Detecting the most significant risks for nosocomial infections.

Lecture 6. Screening programs – theoretical basis. National screening programs for malignant diseases.

Specifying conditions for running mass screening programs. Understanding the preparation process for the introduction of mass screening programs. Familiarizing with the criteria for the introduction of mass screening programs. Familiarizing with the procedure in national programs for early detection of breast, colon, and cervical cancers.

Lecture 7. Communicable disease epidemiology – introduction. Vogralik’s chain. Epidemiological characteristics of intestinal diseases.

Familiarizing with the epidemiology of diseases transmitted through the digestive system and appropriate anti-epidemic measures (with particular reference to alimentary toxic infections and waterborne epidemics)

Lecture 8. Vaccination and vaccine-preventable diseases. Compulsory vaccination program in the Republic of Croatia. Optional vaccines.

Acquiring knowledge about vaccine types, vaccine antigens, and other vaccine ingredients. Familiarizing with vaccines used in mass vaccination programs in Croatia. Familiarizing with the principles of creating a mass vaccination program, epidemiological goals to be achieved in individual and collective protection, and the results of mass vaccination in the country.

Lecture 9. Epidemiological characteristics of respiratory diseases (influenza, TB). Anthropozoonosis. Mosquito-borne diseases.

Acquiring knowledge about the basic principles of the natural course of communicable diseases, epidemiological principles in the occurrence and spread of airborne diseases, their morbidity, as well as prevention measures and anti-epidemic measures on examples of diseases from this group (with particular reference to influenza and TB). Acquiring knowledge about the epidemiological principles in the occurrence and spread of zoonoses and natural-focal diseases, their morbidity, geographical distribution, prevention measures, and anti-epidemic measures on examples of diseases from this group (with particular reference to rabies). Understanding the basic principles of control and prevention of mosquito-borne diseases and emergency anti-epidemic measures (anti-epidemic DDD) in the event of such a disease

Lecture 10. Death and mortality rate in Croatia. Epidemiology of injuries and accidents.

Familiarizing with the mortality rate in the Republic of Croatia and determination of causes of death. Detecting crucial epidemiological characteristics of injuries and accidents in the Republic of Croatia.

Seminars list (with titles and explanation):

Seminar 1. Prevention of travel-associated diseases.

Familiarizing with vaccines outside the mandatory program (vaccination of travelers, international regulation of vaccination). Advising travelers on the epidemiological characteristics of the travel destination and taking prevention measures for protection against communicable diseases (intestinal, respiratory, sexually transmitted, and others).

Seminar 2. Debate on vaccination.

Discussing and reflecting on the current social debate about the compulsory vaccination program. Students will be divided into small groups and organize a debate by advocating for and against the mandatory vaccination program.

Seminar 3. Food safety management systems. Disinfection, disinsection, and deratization.

Familiarizing with the activities and obligations in ensuring food safety (health integrity and safety of food, health education of persons working in the production or distribution of food, HACCP). Familiarizing with regulations and obligations in the field of disinfection, disinsection, and deratization. Reviewing antiepidemic DDD in the 2015 flood.

Seminar 4. Epistemology of epidemiology.

Understanding the basic theoretical concepts of epistemology and knowledge production in epidemiology. Understanding the limitations of medical knowledge and practices in risk factor control. Understanding the problems of research methodologies and issues of knowledge production in health promotion. Understanding the basic paradigms of knowledge construction in medicine in a historical framework. Developing capacity for continuous critical review of explicit and implicit knowledge in epidemiology and biomedical sciences.

Seminar 5. Construction of knowledge in medicine and critical analysis of the limitations of evidence-based medicine.

Understanding different views on the issue of knowledge in medicine. Medicine as a science and as a profession. Epistemological analysis of concepts and procedures of evidence-based medicine. Understanding the limitations of the randomized controlled trial as a source of knowledge in clinical medicine. Understanding the limitations of meta-analysis as a source of clinical knowledge in medicine. Forming an attitude about the limitations of knowledge. A brief overview of examples of knowledge construction in a historical framework on issues of mental health, sexual orientation and work stress.

Practicals list (with titles and explanation):

Practical 1. Descriptive epidemiology. Calculation of incidence, prevalence, mortality rate, etc. Calculation of sensitivity, specificity, positive and negative predictive values of a diagnostic test. Epidemiological indicators of health status in the Republic of Croatia.

Through practical examples, students will independently solve problems of descriptive epidemiology and interpret epidemiological health status indicators in the population of the Republic of Croatia.

Practical 2. Direct and indirect age standardization.

Through practical examples, students will independently calculate direct and indirect age standardization.

Practical 3. Law on the Protection of the Population from Infectious Diseases. Introducing the work of the epidemiological service.

Through personal examples of the application of the Law on the Protection of the Population from Infectious Diseases, students will acquire the knowledge necessary for everyday work.

Practical 4. Analytical epidemiology.

Based on examples of analytical epidemiology, students will practice the development of cohort, casecontrol, and cross-sectional study design.

Practical 5. Alimentary toxic infections.

Based on the example of an outbreak of alimentary toxic infection, students will acquire basic knowledge and skills in interventional epidemiology.

Student obligations:

Students are required to attend regularly and actively participate in all forms of classes. In case the student is prevented from attending classes, they should have proof of a justifiable reason. Students are required to bring a notebook, a pen, and a calculator at seminars and practicals.

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

Evaluation method (ECTS credit system):

In accordance with the Ordinance on Student Assessment and Evaluation at the Faculty of Medicine in Rijeka, students will be assessed and evaluated during classes and on the final exam. Out of a total of 100 grade points (100%), the student can obtain a maximum of 55 points (55%) during classes and a maximum of 45 points (45%) on the final exam.

I. The following is evaluated during classes (maximum 55 points):

a) acquired knowledge evaluated by a test during classes (45 grade points)

b) active participation and knowledge demonstrated at classes (10 grade points)

To access the final exam, the student must obtain a minimum of 50% (28 grade points) during classes. If the student doesn't obtain a sufficient number of grade points during classes to access the final exam (less than 28 grade points from the test and class participation together) or isn't satisfied with the grade points obtained on tests during classes, they must take the make-up written exam with the next group of students.

II. Final exam (maximum 45 points)

The final exam is an oral examination. The final exam consists of three questions, each of which is evaluated with a maximum of 15 grade points (maximum 45 grade points). A student who obtains less than half of the grade points on the final exam (less than 23 grade points) cannot receive a final grade higher than F (insufficient). If a student obtains 23 or more grade points on the final exam, these grade points are added to the grade points (percentages) obtained during classes. The final grade is formed according to the table below.

III. Final grade

is the sum of ECTS grade points obtained during classes and on the final exam. It is determined based on the absolute distribution:

Percentage of acquired knowledge, skills and competencies (classes + final exam)	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% - or less than half of the grade points possible to obtain during class - or less than half of the grade points possible to obtain on the final exam	1 (insufficient)	F

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

Students will choose their representative, who will contact the course coordinator and solve possible problems regarding teaching and course organization. If the student representative cannot resolve an issue with the coordinator, they will contact the course leader. The student representative will take care of the timely exam registration for the whole group and will organize and manage the collection and distribution of the index documents (grade record sheets) after the final exam.

COURSE HOURS 2024/2025

Epidemiology

Lectures (Place and time or group)	**Practicals** (Place and time or group)	**Seminars** (Place and time or group)
26.05.2025		

Lecture 1. Introduction to epidemiology. Historical development of epidemiology.:
• P01 (12:30 - 15:30) [472]
  ○ E_401
 	
Lecture 2. Descriptive epidemiology. Measures of occurrence. Direct and indirect data standardization.:
• P01 (15:30 - 18:30) [473]
  ○ E_401		

prof. prim. dr. sc. Kolarić Branko, dr. med. [472] · izv. prof. dr. sc. Tešić Vanja, dr. med. [473]		
27.05.2025		

Lecture 3. Analytic epidemiology. Measures of association. Epidemiological study design. Sources of bias in population studies:
• P09 - TEACHING IN ENGLISH (11:00 - 14:00) [472]
  ○ E_401
 	
Lecture 4. Diagnostic tests – sensitivity/specificity, predictive value. Epidemiology of chronic mass diseases – introduction. Cardiovascular diseases. Neoplasms. Diabetes.:
• P09 - TEACHING IN ENGLISH (14:00 - 17:00) [473]
  ○ E_401		

prof. prim. dr. sc. Kolarić Branko, dr. med. [472] · izv. prof. dr. sc. Tešić Vanja, dr. med. [473]		
28.05.2025		

Lecture 5. Information systems and interventional epidemiology. Epidemiology of HIV and blood-borne diseases. Post-exposure prophylaxis. Nosocomial infections.:
• ONLINE (11:00 - 14:00) [472]
  ○ E_401
 	
Lecture 6. Screening programs – theoretical basis. National screening programs for malignant diseases.:
• ONLINE (14:00 - 17:00) [473]
  ○ E_401		

prof. prim. dr. sc. Kolarić Branko, dr. med. [472] · izv. prof. dr. sc. Tešić Vanja, dr. med. [473]		
29.05.2025		

Lecture 7. Communicable disease epidemiology – introduction. Vogralik's chain. Epidemiological characteristics of intestinal diseases.: • ONLINE (13:00 - 15:00) [169] ◦ E_401		
prof. dr. sc. Rukavina Tomislav, dr. med. [169]		
03.06.2025		
Lecture 8. Vaccination and vaccine-preventable diseases. Compulsory vaccination program in the Republic of Croatia. Optional vaccines.: • P09 - TEACHING IN ENGLISH (12:30 - 15:30) [474] ◦ E_401		
doc. dr. sc. Tomljenović Morana [474]		
06.06.2025		
Lecture 9. Epidemiological characteristics of respiratory diseases (influenza, TB). Anthropozoonosis. Mosquito-borne diseases.: • P09 - TEACHING IN ENGLISH (14:30 - 17:30) [474] ◦ E_401	Practical 5. Alimentary toxic infections.: • P09 - TEACHING IN ENGLISH (12:30 - 14:30) [478] [169] ◦ E_401	Seminar 3. Food safety management systems. Disinfection, disinsection, and deratization.: • P09 - TEACHING IN ENGLISH (10:30 - 12:30) [478] [169] ◦ E_401
prof. dr. sc. Rukavina Tomislav, dr. med. [169] · mr. sc. Staraj Bajčić Tanja, dr. med. [478] · doc. dr. sc. Tomljenović Morana [474]		
09.06.2025		
Lecture 10. Death and mortality rate in Croatia. Epidemiology of injuries and accidents.: • ONLINE (12:30 - 15:30) [472] [1938] ◦ E_401	Practical 4. Analytical epidemiology.: • P04 (10:30 - 12:30) [474] ◦ E_401	
naslovni asistent Bucić Lovro, dr. med. [1938] · prof. prim. dr. sc. Kolarić Branko, dr. med. [472] · doc. dr. sc. Tomljenović Morana [474]		
10.06.2025		
	Practical 3. Law on the Protection of the Population from Infectious Diseases. Introducing the work of the epidemiological service.: • P09 - TEACHING IN ENGLISH (10:00 - 12:00) [1937] ◦ E_401 Practical 1. Descriptive epidemiology. Calculation of incidence, prevalence, mortality rate, etc. Calculation of sensitivity, specificity, positive and negative predictive values of a diagnostic test. Epidemiological indicators of health status in the Republic of Croatia.: • P09 - TEACHING IN ENGLISH (12:00 - 15:00) [478] ◦ E_401	Seminar 1. Prevention of travel-associated diseases.: • P09 - TEACHING IN ENGLISH (08:00 - 10:00) [1937] [474] ◦ E_401
naslovna asistentica Petaros Šuran Andrea, dr. med. [1937] · mr. sc. Staraj Bajčić Tanja, dr. med. [478] · doc. dr. sc. Tomljenović Morana [474]		

11.06.2025		
	Practical 2. Direct and indirect age standardization.: • ONLINE (11:00 - 14:00) [1938] ◦ E_401	Seminar 2. Debate on vaccination.: • ONLINE (08:00 - 11:00) [1938] [474] ◦ E_401
naslovni asistent Bucić Lovro, dr. med. [1938] · doc. dr. sc. Tomljenović Morana [474]		
13.06.2025		
		Seminar 4. Epistemology of epidemiology.: • ONLINE (08:00 - 11:00) [476] [474] ◦ E_401 Seminar 5. Construction of knowledge in medicine and critical analysis of the limitations of evidence-based medicine.: • ONLINE (11:00 - 14:00) [476] [474] ◦ E_401
doc. dr. sc. Tomljenović Morana [474] · naslovni asistent Štajduhar Dinko, dr. med. [476]		

List of lectures, seminars and practicals:

LECTURES (TOPIC)	Number of hours	Location
Lecture 1. Introduction to epidemiology. Historical development of epidemiology.	3	P01
Lecture 2. Descriptive epidemiology. Measures of occurrence. Direct and indirect data standardization.	3	P01
Lecture 3. Analytic epidemiology. Measures of association. Epidemiological study design. Sources of bias in population studies	3	P09 - TEACHING IN ENGLISH
Lecture 4. Diagnostic tests – sensitivity/specificity, predictive value. Epidemiology of chronic mass diseases – introduction. Cardiovascular diseases. Neoplasms. Diabetes.	3	P09 - TEACHING IN ENGLISH
Lecture 5. Information systems and interventional epidemiology. Epidemiology of HIV and blood-borne diseases. Post-exposure prophylaxis. Nosocomial infections.	3	ONLINE
Lecture 6. Screening programs – theoretical basis. National screening programs for malignant diseases.	3	ONLINE
Lecture 7. Communicable disease epidemiology – introduction. Vogralik’s chain. Epidemiological characteristics of intestinal diseases.	3	ONLINE
Lecture 8. Vaccination and vaccine-preventable diseases. Compulsory vaccination program in the Republic of Croatia. Optional vaccines.	3	P09 - TEACHING IN ENGLISH
Lecture 9. Epidemiological characteristics of respiratory diseases (influenza, TB). Anthropozoonosis. Mosquito-borne diseases.	3	P09 - TEACHING IN ENGLISH
Lecture 10. Death and mortality rate in Croatia. Epidemiology of injuries and accidents.	3	ONLINE

PRACTICALS (TOPIC)	Number of hours	Location

Practical 1. Descriptive epidemiology. Calculation of incidence, prevalence, mortality rate, etc. Calculation of sensitivity, specificity, positive and negative predictive values of a diagnostic test. Epidemiological indicators of health status in the Republic of Croatia.	3	P09 - TEACHING IN ENGLISH
Practical 2. Direct and indirect age standardization.	3	ONLINE
Practical 3. Law on the Protection of the Population from Infectious Diseases. Introducing the work of the epidemiological service.	3	P09 - TEACHING IN ENGLISH
Practical 4. Analytical epidemiology.	3	P04
Practical 5. Alimentary toxic infections.	3	P09 - TEACHING IN ENGLISH

SEMINARS (TOPIC)	Number of hours	Location
Seminar 1. Prevention of travel-associated diseases.	3	P09 - TEACHING IN ENGLISH
Seminar 2. Debate on vaccination.	3	ONLINE
Seminar 3. Food safety management systems. Disinfection, disinsection, and deratization.	3	P09 - TEACHING IN ENGLISH
Seminar 4. Epistemology of epidemiology.	3	ONLINE
Seminar 5. Construction of knowledge in medicine and critical analysis of the limitations of evidence-based medicine.	3	ONLINE

EXAM DATES (final exam):

1.	02.07.2025.
2.	08.09.2025.
3.	22.09.2025.