MEDICAL UNIVERSITY - PLOVDIV

FACULTY OF PUBLIC HEALTH

PROGRAMME

IN

Epidemiology of infectious diseases

Approved by the Departmental Council: Protocol 12/ 03.07.2020

MEDICAL UNIVERSITY – PLOVDIV

FACULTY OF PUBLIC HEALTH

CURRICULUM

Type of courses	*Course hours*				*Credits*
	weekly	*IX semester*	*X semester*	*All*	
Lecture courses	1	6	16	22	***8.6***
Practical courses	1	15	15	30	
All	***2 hours***	***21 hours***	***31 hours***	***52 hours***	

COURSE NAME
Epidemiology

TYPE OF COURSE ACCORDING TO THE UNIFORM STATE REQUIREMENTS
Mandatory

LEVEL OF EDUCATION:
Master degree /MD/

FORM OF EDUCATION:
Lecture courses, practical courses, self-training.

SEMESTERS OF EDUCATION:

9th and 10th semesters

AUDITORIUM CLASSES:
22 hours of lecture courses, 30 hours of practical courses

TECHNICAL EQUIPMENT APPLIED IN THE TRAINING:
audiovisual equipment, tools and technical devices for illustration and performance, test books.

TRAINING METHODS: lecture courses, practical courses, seminars, individual work with excellent students.

CONTROL AND EVALUATION:

- ✓ *Ongoing evaluation* – semesterial tests, oral examinations
- ✓ *Final evaluation* – entry test, written and oral examination.

Score assessment

Participation in seminars, weekly tests, essay preparation and presentation.

Semester exam:

Yes / written and oral examination

State Exam

Yes/oral exam

Lecturer

Full Professor from the Department of Epidemiology

Department:

Epidemiology and disaster medicine

ANNOTATION

The contemporary presentation of epidemiology of infectious diseases – as a essential medical science today. Methodology and methods of epidemiology of infectious diseases and their application in the study of mass, socially significant diseases. Causes, conditions and mechanisms of emergence and spread of infectious diseases. Parasitic and socio-ecosystems in the theory of epidemic process. Primary and secondary driving forces of the epidemic process. Elimination and eradication of infectious diseases. Disinfection, disinsection, deratization. Immunoprophylaxis. Epidemiologic characteristics, surveillance, prevention and control of infectious diseases. Epidemiology, prevention and control of nosocomial infections healthcare-associated infections. Epidemiology of some mass non- communicable diseases with infectious etiology - risk factors, prevention, control.

COURSE OBJECTIVES:

1. Teoretical and practical training in the field of epidemiology as a essential medical discipline.
2. Knowledge about the mode of transmission and distribution of infectious diseases and the system of measures for prevention and control them.
3. Knowledge of basic epidemiological characteristics of chronic mass non communicable diseases and their prevention and control.
4. Knowledge of basic epidemiologic characteristics of non communicable diseases with massive infectious etiology and their prevention and control.
5. Skills such as physicians to participate in solving practical problems limiting, reducing economic and social losses, elimination and eradication of infectious diseases.

COURSE TASKS:

Mastering: theoretical knowledge about the causes, development and elimination of the epidemic process in various infectious diseases; theoretical knowledge about the driving forces of the epidemic process - the source of infection, mechanisms and factors of transmission of infectious disease susceptibility and immunity of the population, social and natural factors, the main methods for epidemiological studies and practical skills for implementation of some of them, theoretical knowledge and practical skills to apply effective tools and methods to control infectious diseases and effective preventive means of reducing, elimination and eradication of infectious diseases. Theoretical knowledge about the epidemiologic features characteristic of mass non communicable diseases with such infectious etiology.

OBLIGATORY COMPETENCIES:

Theoretical knowledge – mastering and analysis of:

- Epidemiology as a essential medical science; population studies, genotype, phenotype and the environment (social and environmental) risk factors that determine in human infectious and non infectious pathology.
- Epidemiology as a science of the epidemic process, the general patterns of occurrence and spreading of infectious diseases in human society, causes, conditions, mechanisms of transmission, peculiarities of the epidemic process in various infectious diseases.
- Methods employed in epidemiologic studies; system for epidemiologic diagnosis.
- System for control and measures and preparations - vaccines, serums, chemical means of disinfection, rodenticides, etc. Technical means and methods – dry heat sterilization, steam sterilization, low temperature sterilization (plasma, hydrogen peroxide gas) - evaluation, effectiveness, application.
- Structure of the epidemiologic surveillance: aim, structure, types.
- To master the methods for identifying risk factors and social significance of the major mass non-communicable diseases.

Practical skills:

- To make the epidemiologic history of different infectious diseases.
- To conduct an epidemiologic study in epidemic outbreaks of airborne and intestinal infections and to evaluate control measures, performed by the GP.
- To prepare a plan for disinfection for gastrointestinal and nosocomial infections/ Hospital-acquired infections (HAIs).
- To prepare a plan for immunizations – obligatory and recommended.
- To prepare a plan for measures to prevent and control the most significant non-communicable diseases prepare.

LECTURE COURSE SYLLABUS

Lecture 1 – 2 hours.

Subject, theory and methods of epidemiology of infectious diseases and epidemiology of mass non-infectious diseases. Theory of the epidemic process.

1.Definition, the aim, the main tasks of epidemiology of infectious diseases and epidemiology of mass non-infectious diseases.
2.Subject of the epidemiology of infectious diseases.
3.Theory of epidemiology of infectious diseases: theory of epidemic process, epidemiologic aspects of infectious process, epidemiologic aspects of epizootic process, socio – ecosystemic dependency of diseases, molecular-genetic processes in microbial populations.
4. Methods of epidemiology: descriptive, analytic, observation, experimental etc.
5. Theory of the epidemic process: definition, driving forces (social and natural).

Lecture 2 – 2 hours.

Source of infection. Transmission of infectious diseases. Susceptible houst. Social factors on epidemic process. Natural factors on epidemic process .

1.Source of infection: definition of source of infection and a reservoir, a animal reservoirs, non animal reservoirs.
2.Transmission of infectious diseases: Direct (Direct contact, Droplet spread); Indirect (Airborne,Vehicleborne, Vectorborne (mechanical or biologic).
3.Zoonoses: definition, routes of transmission.
4. Susceptible houst.
5. Social factors of epidemic process: house, type of urbanization, country, transportation etc. Occupational factors. Human behaviour (among family members, school, work, different groups etc). Public life- science, art culture, moral, religion, health care etc.
5. Natural factors of epidemic process.
6.Non- infectious diseases: environmental factors, social factors, life-style related factors, iatrogenic factors.

Lecture 3 – 2 hours.

Disease Control, Elimination, Eradication and Extinction of infectious diseases.

1. Definitions, development of theory of elimination and eradication.
2. Criteria for elimination and eradication: economic considerations, social and political.
3. The costs and benefits of global eradication programmes.

Lecture 4 – 2 hours.

Epidemiology of air-borne infections: Diphtheria, Scarlet fever, Meningococcial infection, Pertussis.

Definition, Etiology- antigens and resistance in environment , Incubation period, Entry site, Dischrage site, Communicability, Source of infection, Mode of transmission, Immunity after disease, Characteristics of epidemiologic process: Morbidity (general and age-related), Lethality, Seasonality.
Prevention, control and vaccination.

Lecture 5 – 2 hours.

Epidemiology of air- borne infections. Measles, Rubella, Mumps, Varicella.

Definition, Etiology- antigens and resistance in environment , Incubation period, Entry site, Dischrage site, Communicability, Source of infection, Mechanism of transmission, Immunity after disease, Characteristics of epidemiological process: Morbidity (general and age-related) Lethality, Seasonality.
Prevention, control and vaccination.

Lecture 6 – 2 hours.

Epidemiology of intestinal infections. Salmonelosis, Shigelosis.

Definition, Etiology- antigens and resistance in environment , Incubation period, Entry site, Dischrage site, Communicability, Source of infection, Mechanism of transmission, Immunity after disease,Characteristics of epidemiological process: Morbidity (general and age-related), Lethality, Seasonality.
Prevention, control and vaccination.

Lecture 7 – 2 hours.

Epidemiology of intestinal infections. Typhus abdomenalis, Brucellosis, Cholera.

Definition, Etiology- antigens and resistance in environment , Incubation period, Entry site, Dischrage site, Communicability, Source of infection, Mechanism of transmission, Immunity after disease,Characteristics of epidemiological process: Morbidity (general and age-related), Lethality, Seasonality.
Prevention, control and vaccination.

Lectures 8– 2 hours.

Epidemiology of viral hepatitis A, B, C, D, E.

Definition, Etiology- antigens and resistance in environment, Incubation period, Entry site, Dischrage site, Communicability, Source of infection, Mechanism of transmission, Immunity after disease,Characteristics of epidemiological process: Morbidity (general and age-related), Lethality, Seasonality. Geographic distribution.
Prevention, control and vaccination. Risk groups.

Lecture 9– 2 hours.

Epidemiology of HIV/AIDS.

Definition, Etiology- antigens and resistance in environment , Incubation period, Entry site, Dischrage site, Communicability, Source of infection, Mechanism of transmission, Immunity after disease,Characteristics of epidemiologic process: Morbidity (general and age-related), Lethality, Seasonality. Geographic distribution.
Prevention, control. Risk groups.

Lecture 10– 2 hours.

Epidemiology of tick-borne infections: Congo-Crimean fever, Q – rickettsiosis, Mediterranean Spotted fever, Lyme disease.

Definition, Etiology- antigens and resistance in environment , Incubation period, Entry site, Dischrage site, Communicability, Source of infection, Mechanism of transmission, Immunity after disease,Characteristics of epidemiological process: Morbidity (general and age-related), Lethality, Seasonality. Geographic distribution.
Prevention, control. Risk groups.

Lecture 11– 2 hours.
Epidemiology of Tetanus, Anthrax, Rabies.

Definition, Etiology- antigens and resistance in environment , Incubation period, Entry site, Dischrage site, Communicability, Source of infection, Mechanism of transmission, Immunity after disease,Characteristics of epidemiological process: Morbidity (general and age-related), Lethality, Seasonality. Geographic distribution.
Prevention, control, vaccination. Risk groups.

PRACTICAL COURSE SYLLABUS

PRACTICAL №1 – 2 hours.
Essence, purposes and tasks to epidemiologic surveillance and control. GP's tasks related to the control and prevention of infection diseases. Measures for infected people, contacts and the environment.
1.Epidemiologic surveillance and control-definition, tasks and structures. 2.Organization, structure of RHI in Bulgaria.
3.GP's tasks-registration, notice and report to infection diseases. Normative documents to Ministry of Health Care –notification, Note Book for registration of infectious sicks and Note Book of contacts of sicks.
4. Measures for infected people, contacts and the environment. Carriers-indications, mode to collect samples, storage and transport of materials for laboratory examination.

PRACTICAL №2 – 2 hours.
Physical desinfection.
1.Purpose,tasks and meaning of physical and chemical disinfection in epidemiologic control of infection diseases. Definition for desinfection,sterilization,aseptic,antiseptic,sanitization etc.
2. Kinds of physical stuffs for desinfection-sun warm,UV,ionizing radiation,burning,boiling.
3.Structure and principles of work on dry sterilizer, steam sterilizer.Plazma sterilizer. Methods of control on physical sterilization.
4.Organization and principles of work in Central hospital sterilization unit.

PRACTICAL №3 – 2 hours.
Chemical desinfection.
1.Purpose,tasks and meaning of chemical disinfection in epidemiologic control of infectious diseases.
2. Methods for chemical desinfection. The major factors that influence quality of desinfection.
3.Requirements to chemical desinfectants. Characteristics,advantages and disadvantages , ways and place of exposition by groups: oxidants,alchohols, halogens, Hibitane ,aldechydes.
4.Quantity and quality control of chemical disinfection.

PRACTICAL №4 – 2 hours.
Live vectors of infectious diseases. Disinsection.
Epidemiological importance of insects and arthropods as vectors of vector-borne infections. Shematic presentation of the circuits of circulation of the etiological agents of Plague, Tularemia, Crimean –congo hemorrhagic fever, Mediterranean spotted fever and others. Desinsection- definition, epidemiological significance and prevention. Characteristic of the methods of desinsection (biological, mechanical, physical and chemical). Characteristic and

application of chemical means of desinsection by groups: chlorooganic, phosphoroorganic, carbamates and pyrethrinoides.

***PRACTICAL* № 5 – 2 hours.**
Animals and rodents, sources of infectious diseases. Deratisation.
Epidemiological significance of domestic and wild animals (birds, rodents, etc.) as sources of infectious diseases. Shematic presentation of the epidemic processes of certain zoonoses (Q fever, Lyme disease, Hemorrhagic fever with renal syndrome, Anthrax, Salmonellosis, Rabies, etc.) Rodent species with epidemiological significance – gray rat, black rat, water rat, forest and field mice. Peculiarities in the biology and ecology of rodents. Deratization – definition, types (preventive and control), methods (biological, mechanical, physical and chemical). Characteristic and application of rodenticides by groups: slow and rapid acting.

***PRACTICAL* № 6 – 2 hours.**
Epidemiological surveillance and control of nosocomial infections/ Hospital-acquired infections (HAIs).

1.Definition, short historical development by periods, classification, nosocomial infections by types (exogenous, endogenous, imported, exported).
2.Source, mechanism and factors of transmission, risk groups.
3. Characteristics of the epidemic process – prevalence, incidence, risk clinics and hospital population, forms of the epidemic process, lethality and mortality rate. Medical, social and economic importance of nosocomial infections.
4. Surveillance of nosocomial infections, definition, organization, conducting a comprehensive, targeted and limited surveillance. Detection, registration, notification and reporting of nosocomial infections.

***PRACTICAL* № 7 – 2 hours.**
Management and control of outbreaks (community-acquired and nosocomial) and epidemics.
Outbreak and epidemic situation- definition. Predisposition and exposition factors contributed to the outbreak and epidemic situation. Settlement of case studies.

PRACTICAL №8 – 2 hours.
Immune prevention – aim, types, mode of application. Immunization programme of RBulgaria.
1. Epidemiologic significance of the immune prophylaxis for the control of the infectious diseases. Achievements in the elimination and eradication of some diseases.
2. Immunity – definition, aspects of epidemiological immunity. Types of bio products – characteristics and application.
3. Immunization calendar – routine immunizations, schemes of application (age, doses, mode of application). Compatiblity between the vaccines. Contra indications and post immunization complications.
4. Planning, providing, registration and notification of the routine immunization. Obligations of the general practitioners related with the immunizations. Storage and transportation of the bio products.

PRACTICAL №9 – 2 hours.
Immune prevention. Recommended vaccines.

Schemes of application (age, doses, mode of application). Compatiblity between the vaccines. Contra indications and post immunization complications.

PRACTICAL №10 – 2 hours.
Epidemiological study. Surveillance and control of viral hepatitis A, B, C, D, E.
1. Definition, aim and problems of the epidemiological study. Methods, phases and documents for providing the research. Analysis of the data, conclusions and propositions for preventive and epidemic measures.
2. Basic statistical methods for the analysis of the data. Intensive and extensive parameters characterizing the epidemic process.
3. Analysis of epidemiological data to evaluate the effect for prevention and control.

PRACTICAL №11 – 2 hours.
Air- borne infections – epidemiologic survey of scarlet fever, diphtheria, meningococcal infection, pertussis.
1. Characteristics of the epidemic process for scarlet fever, diphtheria, pertussis and meningococcal infection.
2. Epidemiologic study in the focus of infection – epidemiologic history, study on the source and factors of transmission. Determination of the contact persons, needing preventive measures.
3. Evaluation of the provided preventive and epidemic measures.

PRACTICAL №12 – 2 hours.
Air born infections- epidemiologic survey of epidemic outbreak of measles, varicella, rubella and mumps.
1.Characteristic of the epidemic process of measles,varicella,rubella and mumps.
2.Practical implementation of an epidemiologic study in epidemic outbreak- epidemiologic history, study of the source of infection and factors of transmission in epidemic outbreak. Contact subjects to anti-epidemic measures.
3.Conducting anti-epidemic measures.

PRACTICAL №13 – 2 hours.
Epidemiological study of epidemic outbreak of intestinal infections /salmonellosis, shigellosis,colienteritis/.
1.Characteristic of the epidemic process of salmonellosis, shigellosis,colienteritis.
2.Practical implementation of an epidemiological study in epidemic outbreak- epidemiological history, study of the source of infection and factors of transmission in epidemic outbreak. Contact subjects to anti-epidemic measures.
3.Conducting anti-epidemic measures.

PRACTICAL №14 – 2 hours.
Epidemiology of noninfectious diseases with infectious etiology- etiologic and risk factors for cancer.
1. Application of basic scientific and practical approaches of classical epidemiology for the characterization of the most significant noninfectious diseases-cancer.
2. Prevention and control.

PRACTICAL №15 – 2 hours.

Prevention and control of socially significant infectious and noninfectious diseases.

SYLLABUS IN EPIDEMIOLOGY

1. Concepts of Epidemiology*:* subject, theories and methods. Theory of the epidemic process.
2. Source of infection.
3. Transmission of infectious diseases.
4. Susceptible host.
5. Social and natural factors on epidemic process.
6. Vaccines-types of vaccines, adverse events following immunization.
7. Disinfection and sterilization.
8. Disinsection.
9. Deratization.
10. Epidemiology of Nosocomial infections/ Hospital-acquired infections (HAIs).
11. Measures for infected people, contacts and the environment.
12. Epidemiology of Diphtheria.
13. Epidemiology of Scarlatina.
14. Epidemiology of Meningococcal infection.
15. Epidemiology of Pertussis.
16. Epidemiology of Measles.
17. Epidemiology of Rubella.
18. Epidemiology of Chicken pox (Varicella).
19. Epidemiology of Mumps.
20. Epidemiology of Influenza.
21. Epidemiology of Typhus abdominalis.
22. Epidemiology of Salmonelosis.
23. Epidemiology of Shigellosis.
24. Epidemiology of Cholera.
25. Epidemiology of Poliomyelitis.
26. Epidemiology of Hepatitis A and Hepatitis E.
27. Epidemiology of Hepatitis B and Hepatitis D.
28. Epidemiology of Hepatitis C.
29. Epidemiology of Q-fever.
30. Epidemiology of Mediterranean Spotted fever.
31. Epidemiology of Congo-Crimean fever.
32. Epidemiology of Lyme disease.
33. Epidemiology of HIV/AIDS.
34. Epidemiology of Tetanus.
35. Epidemiology of Anthrax.
36. Epidemiology of Rabies.

Recommended literature:

1. Harrison's Principles of Internal Medicine, 20 th Edition . (Part 5:Infectious Diseases)
2. Infectious diseases-clinical cases and more. Authors: R.Komitova, A.Kevorkyan, M.Atanasova, O.Boykinova, 2018, Publisher: Medical University- Plovdiv (Editor: prof. Yordanka Stoilova) (ISBN 978-619-237-019-0).

3. Epidemiology and prevention of vaccine-preventable diseases, 13-th edition (2015). https://www.cdc.gov/vaccines/pubs/pinkbook/chapters.html
4. Lectures and practicals from the course.

Additional resources:

1. European Centre for Disease Prevention and Control https://www.ecdc.europa.eu/en/home
2. Centre for Disease Prevention and Control https://www.cdc.gov/

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