СИЛАБУС ОСВІТНЬОГО КОМПОНЕНТА
MILITARY TOXICOLOGY AND MEDICAL PROTECTION FROM WEAPONS OF MASS DESTRUCTION

Specialty: 221 «Dentistry»
Educational and professional program: Dentistry.
Component code in the educational program: EC87
Level of higher education: second (master's)
Form of education: full-time
Year of study: 5
Semester(s): I (autumn) or II (spring)
Type of educational component: elective
Academic year: 2028-2029

Volume: 3 credits ECTS (90 hours)
Classes: practical classes, consultations
Summary control: credit
Prerequisites: Pharmacology, Life safety, Organization of medical support for troops

Department/division: Department of Disaster Medicine and Military Medicine, 12 Trinklera St., Academic Building, 2-4th Floor
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Educational Component Page in the KhNMU Distance Learning System (Moodle): https://distance.knmu.edu.ua/course/view.php?id=6557

EDUCATIONAL COMPONENT DESCRIPTION

Military Toxicology and Medical Protection from Weapons of Mass Destruction provides students with general knowledge about the main types of weapons of mass destruction: chemical weapons; methods of protection against them, as well as potent toxic substances and toxic technical liquids that lead to damage to people in extreme situations in peacetime.

COURSE OBJECTIVE:

TO STUDY: TOXICOLOGY OF COMBAT AND HIGHLY TOXIC SUBSTANCES, ROCKET FUELS, TECHNICAL FLUIDS USED IN THE MILITARY; RADIATION FACTORS OF A NUCLEAR EXPLOSION AND DURING NUCLEAR REACTOR ACCIDENTS; INDIVIDUAL, COLLECTIVE AND MEDICAL MEANS OF PROTECTION AGAINST COMBAT AND HIGHLY TOXIC SUBSTANCES, NUCLEAR AND CHEMICAL WEAPONS, RADIATION FACTORS ARISING FROM NUCLEAR REACTOR ACCIDENTS; CHEMICAL AND RADIATION CONTROL IN THE MILITARY, MEDICAL UNITS AND MILITARY UNITS.

LEARNING OUTCOMES:

– PROTECTION AND PROVISION OF MEDICAL CARE WHEN HIT BY WEAPONS OF MASS DESTRUCTION OF MEDICAL SERVICE PERSONNEL AND STAGES OF MEDICAL EVACUATION;
– DETERMINE THE MAIN DAMAGING FACTORS OF NUCLEAR AND CHEMICAL WEAPONS, ANTIDOTES
– KNOW THE BASIC RULES FOR PROVIDING MEDICAL CARE IN ACUTE POISONING
– BE ABLE TO PREVENT AND TREAT IONIZING RADIATION INJURIES;
– ASSESS THE SANITARY AND EPIDEMIOLOGICAL SITUATION IN THE CENTER OF THE EMERGENCY;
– CONDUCT MEDICAL TRIAGE AND EVACUATION OF THE WOUNDED AND INJURED IN EMERGENCY SITUATIONS.

CONTENT OF THE EDUCATIONAL COMPONENT

List of lecture topics (12 hours):
1. General characteristics of chemical weapons. Fundamentals of toxicology.
2. Poisonous substances with nerve-paralytic action. Poisonous substances with skin-erosive action.
3. Poisonous substances with general toxic action. Carbon monoxide. Poisonous substances with asphyxiating action.
4. Highly toxic substances (SDO). Poisonous substances with irritating and psychotomimetic action

5. Components of rocket fuels. Technical fluids
6. Characteristics of nuclear weapons. Nuclear accidents.
7. Dosimetric control. Measures of the medical service for protection against nuclear and chemical weapons.
8. Individual and collective means of protection. Special treatment.
9. Indication of poisonous substances.

List of topics of practical classes (18 hours):

1. General characteristics of chemical weapons. Fundamentals of toxicology.
2. Poisonous substances of nerve-paralytic action.
3. Poisonous substances of skin-erosive action. educational component
4. Poisonous substances of general toxic action. Carbon monoxide.
5. Poisonous substances of asphyxiating action.
6. Strongly toxic substances (SDO).
7. Poisonous substances of irritating and psychotomimetic action
8. Components of rocket fuels. Technical fluids
9. Characteristics of nuclear weapons.
10. Nuclear accidents.
11. Measures of the medical service for protection against nuclear and chemical weapons.
12. Individual and collective means of protection.
13. Special treatment.
14. Indication of poisonous substances.
15. Dosimetric control
16. Final module control. Credit

List of topics for independent student work (60 hours)

1. General characteristics of chemical weapons. Fundamentals of toxicology.
2. Poisonous substances of nerve-paralytic action.
3. Poisonous substances of skin-erosive action.
4. Poisonous substances of general toxic action. Carbon monoxide.
5. Poisonous substances of asphyxiating action.
6. Highly toxic substances (SDO).
7. Poisonous substances of irritating and psychotomimetic action
8. Components of rocket fuels. Technical liquids
9. Characteristics of nuclear weapons.
10. Nuclear accidents.
11. Measures of the medical service for protection against nuclear and chemical weapons.
12. Individual and collective means of protection.
13. Special treatment.
14. Indication of toxic substances.
15. Dosimetric control
16. Preparation for final modular control

INDEPENDENT WORK OF THE LEARNER is aimed at deepening and consolidating theoretical knowledge obtained during classroom training and contributes to the formation of professional competencies. The results of INDEPENDENT WORK OF THE LEARNER are subject to control and are included in the final knowledge control.
Consultations: online, with prior registration on the course page in the Distance Learning System of the course.

Teaching methods: practical classes on simulators, mannequins, dummies (imposition of tourniquets, evacuation of the wounded, ensuring airway patency) structured scenarios for consolidating skills under time pressure, work in small groups on situational tasks and cases (combat trauma, damage by chemical weapons, mass admission of victims); independent work and distance learning of materials in Moodle.

ASSESSMENT

Current educational activities (PND). Assessment of the success of education seekers is carried out in accordance with the Instructions for assessing the educational activities of higher education seekers at KhNMU (https://knmu.edu.ua/documents/normatyvni-dokumenty-navchalnogo-proczesu/). The grade for a practical lesson is from 2 to 5 points. Submission of assignments late for unwarranted reasons entails a reduction in the grade in accordance with the percentage of delay in time from the time of completing the assignment. Assignments are checked within 24 hours. Grades are posted in the electronic journal. Unsatisfactory grades are worked out in accordance with the Regulations on the procedure for working out academic classes by KhNMU students (https://knmu.edu.ua/wp-content/uploads/2021/05/polog_vidprac_zaniat.pdf). At the end of the semester, the average grade for the semester is converted into a multi-point grade (70 - 120 points) in accordance with Table 1 of the Assessment Instructions (see above). The arithmetic average of the PND for the semester constitutes the total educational activity (GDA).

Individual tasks (IT) are estimated up to 10 points.

Final control. The condition for admission to the test is to obtain 70 GDA points. The score for the test is from 50 to 80 points.

Discipline grade (OD). OD = GDA + IZ + Z.

Appealing the results of the final control is carried out in accordance with the procedure established by the KNMU (https://knmu.edu.ua/wp-content/uploads/2021/05/polog_apel_kontrol.pdf).

POLICIES OF THE EDUCATIONAL COMPONENT

Recommendations for work on the course: take an active part in all forms of work in classes, devote 1-2 hours. daily independent work and preparation for classes, ask questions during classes, attend consultations, submit assignments on time and complete all forms of control.

Attendance at classes. Attendance at practical classes is mandatory. The dress code during offline classes is a white medical gown. If you are more than 5 minutes late, you may not be allowed to class. Missed classes are made up in accordance with the Regulations on the procedure for students of KNMU to complete academic classes
(https://knmu.edu.ua/wp-content/uploads/2021/05/polog_vidprac_zaniat.pdf).

Academic integrity. KNMU has a zero tolerance policy towards manifestations of academic dishonesty. Any violations of the principles of academic integrity entail liability in accordance with the procedure established at KNMU (https://knmu.edu.ua/wp-content/uploads/2021/05/polog_ad-1.pdf).

Use of electronic gadgets and artificial intelligence tools is allowed only with the permission of the teacher.

Policy for individuals with special educational needs. Applicants with special educational needs should contact the teacher to develop an individual educational trajectory.

Teacher response time: 24 hours

Technical requirements for working on the course:

- access to a computer, laptop, tablet or smartphone

- corporate Google account with your own photo
- skills in working with Google Workspace (Google Meet, Docs, Sheets, Slides, Forms) and Moodle

Technical support: ACS (ev.shevtsov@knmu.edu.ua), Google (tehotdelknmu@gmail.com), Moodle (al.korol@knmu.edu.ua)

RECOMMENDED SOURCES

1. Ustinova LA, Bohaienko VL, Khizhniak MI, et al. Current threats to the use of combat toxic nervous and paralytic action on the territory of Ukraine and features of medical protection. Ukrainian Journal of Military Medicine. 2022; 2(3):-. doi:10.46847/ujmm.2022.2(3)-081.
2. Shumeiko AE, Korotkikh NI. Chemical warfare agents: Structure, properties, decontamination (Part 1). Journal of Organic and Pharmaceutical Chemistry. [Internet]. 2024;–. doi:10.24959/ophcj.24.312459.
3. Shumeiko AE, Korotkikh MI. Chemical warfare agents: Structure, properties, decontamination (Part 2). Journal of Organic and Pharmaceutical Chemistry. [Internet]. 2024;–. doi:10.24959/ophcj.24.313307.
4. Mykhaylov VS. The threat of weaponization of synthetic opioids and approaches to the development of antidotes and protective means. Ukrainian Journal of Military Medicine. 2025;1(6):-. doi:10.46847/ujmm.2025.1(6)-062.
5. Ustinova LA, Saglo VI, Barkevich VA, et al. Current problems of the health protection of Ukrainian Armed Forces servicemen from military toxic agents. Emergency Medicine. [Internet]. 2019;8(103). doi:10.22141/2224-0586.8.103.2019.192375.
6. „Chemical, Biological, Radiological and Nuclear (CBRN) Injury. Part I: Initial Response to CBRN Agents" [Internet]. 23 Feb 2024.

Information resources

1. Representation of the President of Ukraine http://www.president.gov.ua/.
2. Verkhovna Rada of Ukraine http://www.rada.kiev.ua
3. Cabinet of Ministers of Ukraine http://www.kmu.gov.ua/
4. National Security and Defense Council of Ukraine http://www.rainbow.gov.ua/
5. Ministry of Education and Science of Ukraine http://www.mon.gov.ua/
6. State Emergency Service of Ukraine. http://www.mns.gov.ua
7. Permanent Mission of Ukraine to the UN http://ukraineun.org/
8. North Atlantic Treaty Organization (NATO) http://www.nato.int/
9. World Health Organization. https://www.who.int/ukraine/uk

Head of the Department of Disaster Medicine and Military Medicine _____Prof. Volkova Yu.