

**MINISTRY OF EDUCATION AND SCIENCE OF THE REPUBLIC OF
KAZAKHSTAN**

**A. Baitursynov Kostanay State University
Department of Biology and Chemistry**

Babenko O.N.

BASICS OF LIFE SAFETY

Educational and Methodical Complex of the Discipline

Specialty 5B060800-Ecology

Kostanay, 2016

UDC 614.8 (075.8)
LBC 68.9 (5 Kaz) я73
B 11

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Babenko O.N.

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Educational and methodical complex of the discipline “Basics of Life Safety” includes: training program, syllabus for students, map of educational and methodical support of discipline, lecture complex, plans of practical (seminar) classes, methodical recommendations for the study of discipline, materials for independent work of students, materials for the monitoring and evaluation of educational achievements of students, software and multimedia support for training classes.

Educational and methodical complex of discipline “Basics of Life Safety” intended for students of specialty “5B060800-Ecology”. It also can be recommended to teachers of colleges or higher educational institutions during the training sessions on the Basics of Life Safety in English and on other specialties.

UDC 614.8 (075.8)
LBC 68.9 (5 Kaz) я73

It is approved and recommended for the publication by educational and methodical council of the A. Baytursynov Kostanay state university, 28.04.2016, protocol No 3.

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INTRODUCTION

Dear students and teachers!

For your attention is offered educational and methodical complex of the discipline “Basics of Life Safety” that intended for students of specialty “5B060800-Ecology”. It also can be recommended to teachers of colleges or higher educational institutions for conducting the training sessions on the Basics of Life Safety in English and for other specialties.

Life Safety – is an emerging at the intersection of many sciences independent area of knowledge that studies the issues of safe interaction of human with his environment and the protection of population against dangers in the emergencies. It also provides the production of abilities and skills for salvation of health and life at the event of hazards.

A modern professional expert should be adequately prepared for the dangerous conditions for the successful solution of the problems to ensure life safety. The discipline “Basics of Life Safety” to a certain extent helps to develop students' safety ideology, constructive thinking skills and behavior for the purpose of safe implementation of their professional and social activity.

Educational and methodical complex of the discipline “Basics of Life Safety” includes:

- training program;
- syllabus for students;
- map of educational and methodical support of discipline;
- lecture complex;
- plans of practical (seminar) classes;
- methodical recommendations for the study of discipline;
- materials for independent work of students;
- materials for the monitoring and evaluation of educational achievements of students;
- software and multimedia support for training classes.

The structure and content of the educational methodical complex corresponds to the modern scientific and methodological level in this area and adapted for modern educational technologies.

Good luck!

PART 1
TRAINING PROGRAM



MINISTRY OF EDUCATION AND SCIENCE OF THE REPUBLIC OF
KAZAKHSTAN

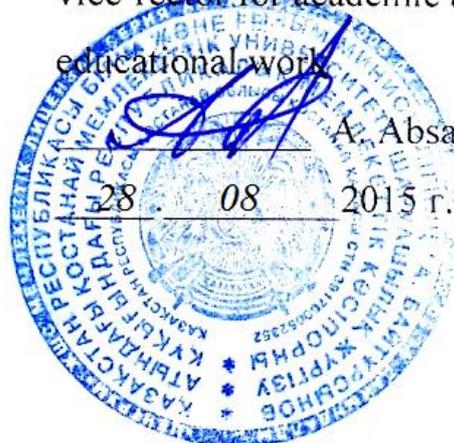
RSE «A. Baitursynov Kostanay
state university»

Agro-biological faculty

Approve

vice-rector for academic and
educational work

A. Absadykov



Department of Biology and Chemistry

TRAINING PROGRAM

discipline	Basics of Life Safety
specialty	5B060800-Ecology
total credits	2

Kostanay, 2015

Training program is designed by Babenko O.N., PhD, senior lecturer

13.06.2015



It is considered and recommended at the meeting of the Department of Biology and Chemistry

17.06.2015, protocol No 6

Head of the department



G. Sultangazina

It is approved by methodical council of Agro-biological faculty

24.06.2015, protocol No 6

Chairman of the methodical council



M. Shepelev

1 Description of discipline

The discipline “Basics of Life Safety” is a general educational compulsory discipline, entering in the module OMinv_03 - General discipline curriculum.

This discipline equips future professionals with theoretical knowledge and practical skills necessary for creation of safe and harmless conditions for vital function, predicting and making competent decisions in emergencies to protect the population and production personnel of the organizations from possible accidents, natural disasters and the use of modern means of destruction, and during elimination of their consequences.

Prerequisites: physics, chemistry, mathematics.

Postrequisites: skills of the conscientious and responsible attitude to questions of personal security and safety of people around.

Purpose and objectives of discipline

The purpose of discipline – to introduce to the students the bases of safe interaction of the human with the environment and bases of protection against the negative factors in different situations

The main objectives of the discipline is to master the theoretical knowledge and practical skills necessary to create a safe and harmless conditions of vital functions, forecasting and adoption of competent decisions.

When studying a course students have to

know:

- acts of the Republic of Kazakhstan in the field of emergency situations;
- normative documents in the field of health and safety;
- dangers of the human environment;
- ways to improve the stability of functioning of the managing objects in emergency situations (ES), and measures to elimination of their consequence;
- methods of monitoring of dangerous and extremely dangerous situations;

be able:

- to control parameters of negative impacts and to estimate levels of negative impacts;
- to develop actions for increase of life safety;
- to solve situational problems;

get:

- skills of planning and participation in carrying out rescue and other emergency operations;
- skills of using of personal protective equipment;
- skills of giving first aid to victims;

be competent: in questions of safety of vital function

2 Content of discipline

Module 1. Organizational basis of life safety

1.1 Introduction

The purpose and objects of discipline. Place of discipline in the natural sciences. The role of the government in ensuring of safety. Evolutionary development protective of human activity: safety measures, labor protection, environmental protection, civil defense, protection in the emergency and life safety.

1.2 Legislative and legal acts in the field of life safety. The objectives and principles of construction and functioning of the civil defense (CD) in the Republic of Kazakhstan

The law of the Republic of Kazakhstan “On state of emergency”.

The Law of the Republic of Kazakhstan “On Civil Protection”. Problems of Civil Defense (CD). The principles of CD. The organizations and the responsible persons engaged in the realization of actions of CD. The principles of the organization of CD and protection of people in emergencies at industrial facilities. Planning of actions for CD and emergency situations at facilities.

1.3 Classification of dangerous and harmful factors. Radiation and chemical hazards

Dangerous production and household factors. Classification of dangers. Rationing of the content of harmful substances. Chronic poisonings, occupational and household diseases at effect of toxins.

Ionizing radiation. External and internal radiation, doses. Their action on a human body. Radiation sickness and other diseases. The basic principles of radiation safety. Classification of radiation facilities by potential danger. Protective measures. Radiation control and monitoring. Sanitary and preventive actions.

Classification of chemically hazardous facilities and chemical emergencies. Methods of protection and personal protective equipment. Evaluation of the consequences of chemical accidents. Devices of chemical reconnaissance.

Module 2. Protection of the person and the environment from harmful and dangerous factors of a natural and technogenic origin

2.1 Current state of a technosphere and technosphere’s safety

Technosphere. Stages, regularities and indicators of development of system. Influence of population explosion, urbanization, growth of power energy, transport, industrial production and other branches of economy on the development of technosphere.

Technosphere security systems. The concept about dangerous zones and zones of life activity. The principles of decrease of danger in zones of life activity. Methods of safety’s realization in zones of life activity.

2.2 Classification of emergencies of various characters. The basic principles and ways of protection of the population in emergencies

Three main classification of the signs of emergencies: by the sphere of emergence, by departmental affiliation, by the scale of emergency zone. Emergencies of natural and technogenic characters.

Principles of protection of the population. Actions for protection of the population. Engineering protection in the conditions of peace and wartime. Evacuation of the population. Radiation and chemical protection. Medical actions. The first pre-medical aid at emergencies. Emergencies of social character. Psychological aspects of emergencies.

Protection of the population at natural disasters, during the fires, accidents and explosions in industrial facilities.

Geological dangerous phenomena, ways of protection. Earthquakes, classification. The behavior of the population during an earthquake. Organizational and practical safety measures during earthquakes.

Fires. Classification of the fires, their dangerous factors. The behavior of people in fires. General characteristic of the external and internal fires. Classification of substances by fire danger. Categorization of premises on a fire and explosion safety. Classification of explosives and mixes. Methods and means of protection from a shock wave. Safety of the exploitation of high-pressure systems.

Hydrological emergencies, classification. The behavior of people during floods.

Infectious sickness rate of people, animals and plants.

Protection against weapons of mass destruction. General characteristic of weapons of mass destruction, its features and consequences of using. Effects of nuclear explosions: zone of destruction and radioactive contamination. Methods and means of protection. Emergencies when using the chemical weapon. Emergencies when using the bacteriological weapon. Methods and means of protection. New types of weapons of mass destruction, the methods and means of protection. Protective constructions, refuge, shelters.

2.3 Stability of functioning of the economic facilities in emergencies

Concept of the stability of functioning. Stability of the functioning of industrial facilities in emergency during peace and wartime. The factors influencing on the stability of the functioning of facilities. Ways to improve the stability of functioning of the economic facilities in emergencies. Ways to improve the reliability of protection of the personnel at the facilities. Ways to improve the stability of engineering complex systems and facility management. Requirements of the norms of civil defense of industrial and civil facilities.

Bases of the organization and carrying out salvage and rescue operations. Purposes, structure, appointment, organization of carrying out rescue and urgent operations. Forces and funds involved for their carrying out. List of rescue and urgent operations. Bases of the management of salvage and rescue operations and other works.

3 The list of the recommended resources

Required resources:

- 1 The Law of the Republic of Kazakhstan “On Civil Protection” dated 11 April 2014 No. 188-V – Access: <http://adilet.zan.kz/eng/docs/Z1400000188>
- 2 The Code of the Republic of Kazakhstan “On public health and health care system” dated on September 18, 2009 No 193-IV – Access: http://adilet.zan.kz/eng/docs/K090000193_/compare
- 3 The law of the Republic of Kazakhstan “On state of emergency” dated 8 February, 2003 No. 387 – Access: http://adilet.zan.kz/eng/docs/Z030000387_
- 4 The Law of the Republic of Kazakhstan “On State Control of Turnover of Particular Types of Weapon” dated 30 December 1998 No. 339 – Access: http://adilet.zan.kz/eng/docs/Z980000339_/compare
- 5 The Law of the Republic of Kazakhstan “On Military Situation” dated 5 March 2003 No. 391 – Access: http://adilet.zan.kz/eng/docs/Z030000391_
- 6 The Law of the Republic of Kazakhstan “On Technical Regulation” dated 9 November, 2004 No.603 – Access: http://adilet.zan.kz/eng/docs/Z040000603_/compare

Supplementary resources:

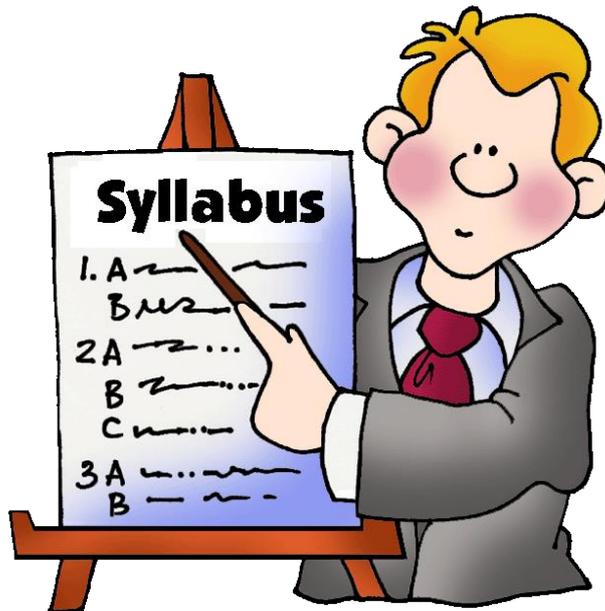
- 7 Environmental Code of the Republic of Kazakhstan dated 9 January, 2007 No.212 – Access: http://adilet.zan.kz/eng/docs/K070000212_
- 8 Labour Code of the Republic of Kazakhstan dated 15 May, 2007 No. 251 – Access: http://adilet.zan.kz/eng/docs/K070000251_
- 9 The Law of the Republic of Kazakhstan “On countering terrorism” dated 13 July, 1999 No. 416 – Access: http://adilet.zan.kz/eng/docs/Z990000416_
- 10 Kazakh Legislation in English. – Access: <http://www.yurclub.kz/>
- 11 Process Safety and Environmental Protection (Journal) – Access: <http://www.journals.elsevier.com/process-safety-and-environmental-protection/>

4. Appendix

Syllabus for students in the discipline

PART 2

SYLLABUS FOR THE STUDENTS



Syllabus for the students
for 2015-2016 academic year on discipline
OBZh/BLS 1103 – Основы безопасности жизнедеятельности /
Basics of Life Safety

1 Basic information							
Faculty		Agro-biological faculty (ABF)					
Specialty		5B060800-Ecology					
Course	1	Semester	2	Training form	Full-time	Training program	General disciplines
Cycle of disciplines		General educational compulsory discipline		Component		Compulsory component	
Number of credits		2		Number of hours		90	
Meeting place for classes			housing 2, according to schedule				
Program supervisor			O. Babenko				
Teacher			O. Babenko				
Tutorial time (Independent work of the student with the teacher, individual)			1-st week		2-nd week		3-rd week
			According to the work schedule				
2 Prerequisites and postrequisites							
Prerequisites		physics, chemistry, mathematics					
Postrequisites		skills of the conscientious and responsible attitude to questions of personal security and safety of people around					
3 Purpose and objectives of discipline							
Purpose	To introduce to the students the bases of safe interaction of the human with the environment and bases of protection against the negative factors in different situations.						
Objectives	To master the theoretical knowledge and practical skills necessary to create a safe and harmless conditions of vital functions, forecasting and adoption of competent decisions.						
4 Distribution of academic hours							
Total	Practical classes	Laboratory classes	IWST	IWS	Form of control		
2 credits, 90 hours	30	-	20	40	Exam		
5 Content of discipline							
This discipline equips future professionals with theoretical knowledge and practical skills necessary for creation of safe and harmless conditions for vital function, predicting and making competent decisions in emergencies to protect the population and production personnel of the organizations from possible accidents, natural disasters and the use of modern means of destruction, and during elimination of their							

consequences.	
6 Course policy	
<p>The student should systematically prepare for classes and perform all tasks for independent (self) work.</p> <p>All kinds of controls may be repeated only once when student received an unsatisfactory assessment. This assessment are reduced by a coefficient of 0.8.</p> <p>If student gets a positive assessment (C-, C, C+, B-, B, B+) on exam, he can not repeat an exam.</p> <p>In the classroom, students must comply with regulation and safety, and do not use cell phones.</p>	
7 The list of the recommended resources	
Required resources:	<p>1 The Law of the Republic of Kazakhstan “On Civil Protection” dated 11 April 2014 No. 188-V – Access: http://adilet.zan.kz/eng/docs/Z1400000188</p> <p>2 The Code of the Republic of Kazakhstan “On public health and health care system” dated on September 18, 2009 No 193-IV – Access: http://adilet.zan.kz/eng/docs/K090000193_/compare</p> <p>3 The law of the Republic of Kazakhstan “On state of emergency” dated 8 February, 2003 No. 387 – Access: http://adilet.zan.kz/eng/docs/Z030000387_</p> <p>4 The Law of the Republic of Kazakhstan “On State Control of Turnover of Particular Types of Weapon” dated 30 December 1998 No. 339 – Access: http://adilet.zan.kz/eng/docs/Z980000339_/compare</p> <p>5 The Law of the Republic of Kazakhstan “On Military Situation” dated 5 March 2003 No. 391 – Access: http://adilet.zan.kz/eng/docs/Z030000391_</p> <p>6 The Law of the Republic of Kazakhstan “On Technical Regulation” dated 9 November, 2004 No.603 – Access: http://adilet.zan.kz/eng/docs/Z040000603_/compare</p>
Supplementary resources	<p>7 Environmental Code of the Republic of Kazakhstan dated 9 January, 2007 No. 212 – Access: http://adilet.zan.kz/eng/docs/K070000212_</p> <p>8 Labour Code of the Republic of Kazakhstan dated 15 May, 2007 No. 251 – Access: http://adilet.zan.kz/eng/docs/K070000251_</p> <p>9 The Law of the Republic of Kazakhstan “On countering terrorism” dated 13 July, 1999 No. 416 – Access: http://adilet.zan.kz/eng/docs/Z990000416_</p> <p>10 Kazakh Legislation in English. – Access: http://www.yurclub.kz/</p> <p>11 Process Safety and Environmental Protection (Journal) – Access: http://www.journals.elsevier.com/process-safety-and-environmental-protection/</p>

8 Calendar-thematic plan

№	Topics of practical classes	hours	Topics of IWST (mass)	hours	Topics of IWST (group)	hours
Module 1. Organizational basis of life safety						
1	The purpose and objects of discipline. Place of discipline in the natural sciences. The role of the government in ensuring of safety. Evolutionary development protective of human activity: safety measures, labor protection, environmental protection, civil defense, protection in the emergency and life safety.	2	Introduction. Legislative and legal acts in the field of life safety. The objectives and principles of construction and functioning of the civil defense (CD) in the Republic of Kazakhstan.	1		
2	The law of the Republic of Kazakhstan “On state of emergency”.	2				
3	The Law of the Republic of Kazakhstan “On Civil Protection”.	2			Essay on the topic of “What do I mean about life safety?”	1
4	Dangerous production and household factors. Classification of dangers. Rationing of the content of harmful substances. Chronic poisonings, occupational and household diseases at effect of toxins.	2	Classification of dangerous and harmful factors. Radiation and chemical hazards.	1		
5	Ionizing radiation. External and internal radiation, doses. Their action on a human body. Radiation sickness and other diseases. The basic principles of radiation safety. Classification of radiation facilities by	2				

	potential danger. Protective measures.					
6	Classification of chemically hazardous facilities and chemical emergencies. Methods of protection and personal protective equipment. Evaluation of the consequences of chemical accidents. Devices of chemical reconnaissance.	2			Radiation control and monitoring. Sanitary and preventive actions.	1
Module 2. Protection of the person and the environment from harmful and dangerous factors of a natural and technogenic origin						
7	Technosphere. Stages, regularities and indicators of development of system.	2	Current state of a technosphere and technosphere's safety	1		
8	Influence of population explosion, urbanization, growth of power energy, transport, industrial production and other branches of economy on the development of technosphere.	2				
9	Technosphere security systems. The concept about dangerous zones and zones of life activity. The principles of decrease of danger in zones of life activity. Methods of safety's realization in zones of life activity.	2			Technosphere security systems.	1
10	Three main classification of the signs of emergencies: by the sphere of emergence, by departmental affiliation, by the scale of emergency zone. Emergencies of natural and technogenic characters.	2	Classification of emergencies of various characters. The basic principles and ways of protection of the population in emergencies.	1		

11	Principles of protection of the population. Engineering protection in the conditions of peace and wartime.	2				
12	Protection of the population at natural disasters, during the fires, accidents and explosions in industrial facilities. Geological dangerous phenomena, ways of protection. Earthquakes, classification. The behavior of the population during an earthquake. Organizational and practical safety measures during earthquakes.	2			Hydrological emergencies, classification. The behavior of people during floods.	1
13	Protection against weapons of mass destruction. General characteristic of weapons of mass destruction, its features and consequences of using.	2	Stability of functioning of the economic facilities in emergencies	1		
14	Concept of the stability of functioning. Stability of the functioning of industrial facilities in emergency during peace and wartime.	2				
15	Bases of the organization and carrying out salvage and rescue operations. Purposes, structure, appointment, organization of carrying out rescue and urgent operations.	2			List of rescue and urgent operations. Bases of the management of salvage and rescue operations and other works.	1
	Total hours	30		5		5

9 Timetable for implementation and delivery tasks on the discipline

Total	Kinds of activities		Class work	IWS			IWST		Reliability rating
	Types of control			Presentation	Essay	CC	BC		
	Form of control	Activity on the practical classes					Colloquium	Interview	
				FC	Exam	40	100	100	
			100					100	
		*		*				*	
		*					*	*	
		*						*	
		*		*			*	*	
		*						*	
		*		*			*	*	
		*		*			*	*	
60									
40									
100									

Note 1. A student, who gets at least 50% out of 100% and positive marks for all types of tasks at the end of semester, is allowed to take an exam. To obtain a positive assessment result it is necessary to get at least 50% out of 100% at the exam.

Note 2. In the case of non-attendance on the practical classes, the student must work off missed classes.

Criteria for evaluation

Traditional evaluation	Excellent	Good	Satisfactory	Poor
Points (maximum = 100)	90-100	75-89	50-74	0-49

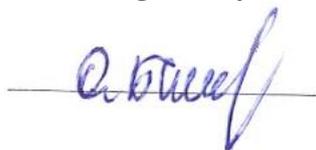
** All the educational achievements of students are evaluated according to 100-point scale for each completed task (the answer in class, homework, the implementation of control work, and others.). The final result of the assessment is calculated by the amount of the arithmetic mean of all evaluations by type of work.

10 Tasks for IWS

No	Theme of tasks, types of work	Hours	Resources of information	Form of reporting	Deadlines, week
1	Essay on the topic of “What do I mean about life safety?”	1	1-11 + Internet	Essay	3
2	Radiation control and monitoring. Sanitary and preventive actions.	0.5	1-11 + Internet	Interview	6
3	Technosphere security systems.	0.5	1-11 + Internet	Presentation	9
4	Hydrological emergencies, classification. The behavior of people during floods.	1	1-11 + Internet	Presentation	12
5	List of rescue and urgent operations. Bases of management of wrecking and other works.	0.5	1-11 + Internet	Synopsis in the notebook, colloquium	15
Other kinds of IWS					
	Preparation for lectures (0,5 hour x number of classes)	2,5			
	Preparation for practical classes (1 hour x number of classes)	30			
	Preparation for boundary control (2 hours x 1 boundary control)	4			
	Total hours	40			

Program and syllabus for students is designed by Babenko O.N., PhD, senior lecturer

20.06.2015.

A handwritten signature in blue ink, appearing to read 'O. Babenko', written over a horizontal line.

It is considered and recommended at the meeting of the department of biology and chemistry

17.06.2015, protocol No 6

Head of the department:

A handwritten signature in blue ink, appearing to read 'G. Sultangazina', written over a horizontal line.

G. Sultangazina

PART 3

MAP OF EDUCATIONAL AND METHODOLOGICAL SUPPORT OF THE DISCIPLINE



APPROVE

Head of the Department of
Biology and Chemistry

 G. Sultangazina

«28».08. 2015.

**Map of educational and methodical support of the discipline
«Basics of Life Safety»
for 2015-2016 academic year**

Speciality	Number of students		Bibliography (author, title, place and year of publication, number of pages)	Publication type	Information carrier	Number of copies		Finding in online	Note	
	even semester	odd semester				Library	Department			
1	2	3	4	5	6	7	8	9	10	
5B060800- ecology		14	1. Textbooks, manuals, e-learning editions							
			Basic							
			1. The Law of the Republic of Kazakhstan “On Civil Protection” dated 11 April 2014 No. 188-V.	The Law of the Republic of Kazakhstan	Electronic		1	http://adilet.zan.kz/eng/docs/Z140000188		
			2. The Code of the Republic of Kazakhstan “On public health and health care system” dated on September 18, 2009 No 193-IV	The Code of the Republic of Kazakhstan	Electronic		1	http://adilet.zan.kz/eng/docs/K090000193_/compare		

1	2	3	4	5	6	7	8	9	10
			3. The law of the Republic of Kazakhstan “On state of emergency” dated 8 February, 2003 No. 387	The law of the Republic of Kazakhstan	Electronic		1	http://adilet.zan.kz/eng/docs/Z030000387_	
			4. The Law of the Republic of Kazakhstan “On State Control of Turnover of Particular Types of Weapon” dated 30 December 1998 No. 339	The Law of the Republic of Kazakhstan	Electronic		1	http://adilet.zan.kz/eng/docs/Z980000339_/compare	
			5. The Law of the Republic of Kazakhstan “On Military Situation” dated 5 March 2003 No. 391	The Law of the Republic of Kazakhstan	Electronic		1	http://adilet.zan.kz/eng/docs/Z030000391_	
			6. The Law of the Republic of Kazakhstan “On Technical Regulation” dated 9 November, 2004 No.603	The Law of the Republic of Kazakhstan	Electronic		1	http://adilet.zan.kz/eng/docs/Z040000603_/compare	
			Supplementary						
			7. Environmental Code of the Republic of Kazakhstan dated 9 January, 2007 No.212	Environmental Code of the Republic of Kazakhstan	Electronic		1	http://adilet.zan.kz/eng/docs/K070000212_	
			8. Labour Code of the Republic of Kazakhstan dated 15 May, 2007 No. 251	Labour Code of the Republic	Electronic		1	http://adilet.zan.kz/eng/doc	

1	2	3	4	5	6	7	8	9	10	
				lic of Kazakh stan				s/K07 00002 51_		
			9. The Law of the Republic of Kazakhstan “On countering terrorism” dated 13 July, 1999 No. 416	The Law of the Repub- lic of Kazakh stan	Elect ronic		1	http://a dilet.z an.kz/e ng/doc s/Z990 00041 6_		
			10. Kazakh Legislation in English	Elect- ronic site	Elect ronic		1	http:// www. yurclu b.kz/		
			11. Process Safety and Environmental Protection ()	Elect- ronic Journal	Elect ronic		1	http:// www.j ournal s.elsev ier.co m/proc ess- safety- and- enviro nment al- protect ion/		
			Total copies textbooks and e- learning editions				11			
			2. Methodical manuals of department							
			Total copies of methodical manuals			0	0	0		
			Total copies			0	11	0		

Compiled by:

PhD, senior lecturer
O.N. Babenko

PART 4
LECTURE COMPLEX



4.1 INTRODUCTION. LEGISLATIVE AND LEGAL ACTS IN THE FIELD OF LIFE SAFETY. THE OBJECTIVES AND PRINCIPLES OF CONSTRUCTION AND FUNCTIONING OF THE CIVIL DEFENSE IN THE REPUBLIC OF KAZAKHSTAN

The purpose of the lecture to introduce students:

- the basic concepts of life safety;
- legislative and legal acts in the field of life safety;
- objectives and principles of construction and functioning of the civil defense in the Republic of Kazakhstan.

Plan:

1. Introduction.
2. Legislative and legal acts in the field of life safety.
3. The objectives and principles of construction and functioning of the civil defense in the Republic of Kazakhstan.

1. Introduction.

Basic concepts and definitions of life safety.

Study of discipline “Basics of Life Safety” is started with definition of two words “safety” and “life activity”.

The first, we consider the term “life activity”. “Life activity” consists of two words – “life” and “activity”, so find out first meaning of each word.

Life - is a form of existence of matter, which is distinguished from other forms the ability for reproduction, growth, development, actively regulating its composition and functions of motion, the ability of adaptation to the environment and the presence of metabolism and response to stimulate.

The Concise Oxford Dictionary defines life as “The condition which distinguishes active animals and plants from inorganic matter, including the ability for growth, functional activity and the continual change preceding death”.

Life is the highest form of existence of matter in comparison with others - physical, chemical, power and so on. The activity is a property of all living things so that the term “life” is to some extent involves activity.

Activity is specifically human form of activity, a necessary condition for the existence of human society, the meaning of which is advisable to change and transformation environment in the interests of the human. Man does not only adapts to the environment, but also interacts with it and transforms it to his own needs.

Life activity – the process of self-existence and balanced of individual, group of individuals, society and humanity in general, in the unity of their vital needs and opportunities.

We return to the definition of “Safety”.

Safety – a balanced state of human society, the state, natural, anthropogenic systems, etc.

Safety of life activity – a branch of knowledge, scientific and practical activities aimed at studying the general laws of danger, their properties, impact of

their consequences on the human body, the basics of protection of health and life of man and his environment against the dangers as well as the development and implementation of appropriate means and measures to create and maintain healthy and safe living conditions and human activities both in everyday life, conditions and emergencies.

Life Safety is the condition of being protected against physical, social, spiritual, financial, political, emotional, occupational, psychological, educational, or other types or consequences of failure, damage, error, accidents, harm, or any other event that can be considered as non-desirable.

Safety also can be defined as the control of recognized hazards to achieve an acceptable level of risk. It can take the form of being protected from the event or from exposure to something that causes health or economical losses.

It can include protection of people or of possessions.

Failure – is the state or condition of not meeting a desirable or intended objective, and may be considered as the opposite of success.

Damage is a destruction or a loss in value, usefulness, or ability as a result of any action or event.

Types of damage:

- Collateral damage is unintended damage caused during a military operation;
- Fire damage;
- Foreign object damage;
- Property damage is damage of public or private property;
- Radiation damage is damage or injury due to ionizing radiation;
- Water damage is damage done by water to materials not resistant to the effect of water.

An **error** is an action, which is inaccurate or incorrect.

An **accident** is an undesirable incidental and unplanned event that can be prevented by circumstances leading up to the accident recognized, and acted upon, prior to its occurrence.

Harm is a moral and legal concept. Bernard Gert construes harms as any of the following:

- Pain;
- Death;
- Disability;
- Loss of ability or freedom;
- Loss of pleasure.

2. Legislative and legal acts in the field of life safety.

- The law of the Republic of Kazakhstan “On state of emergency”.

(it is dated 8 February, 2003 No. 387)

A government or division of government (i.e. on a municipal, provincial/state level) may declare that their area is in a state of emergency. This means that the government can suspend and/or change some functions of the executive, the legislative and/or the judiciary during this period of time. It alerts citizens to change

their normal behavior and orders government agencies to implement emergency plans. A government can declare a state of emergency during a time of natural or human-made disaster, during a period of civil unrest, or following a declaration of war or situation of international/internal armed conflict.

- The Law of the Republic of Kazakhstan “On Civil Protection”.
(it is dated 11 April 2014 No. 188-V)

This Law regulates public relations arising in the course of carrying out of measures on civil protection and oriented to prevention and liquidation of emergency situations of natural and technogenic character and their consequences, rendering of emergency medical and psychological treatment to population being in the zone of emergency situation, ensuring of fire-fighting and industrial safety, as well as determines main tasks, organizational principles of posture and functioning of civil protection of the Republic of Kazakhstan, formation, keeping and use of state material reserve, organization and activity of accident rescue services and groups.

3. The objectives and principles of construction and functioning of the civil defense in the Republic of Kazakhstan

Civil defense – component part of the state system of civil protection designed for implementation of the general state set of measures carried out in peace and wartime, on protection of population and territory of the Republic of Kazakhstan from impact of adverse (destruction) factors of modern means of destruction, emergency situations of natural and technogenic character

Civil protection – nationwide set of measures carried out in peace and war time oriented to prevention and liquidation of emergency situations of natural and technogenic character and their consequences, organization and prosecution of civil defense, rendering of emergency medical and psychological treatment to population being in the zone of emergency situation that includes the measures on ensuring of fire-fighting and industrial safety, formation, keeping and use of the state material reserve

State system of civil protection consists of territorial and sectoral subsystems.

Territorial subsystems shall be created at oblast, city and district levels for prevention and liquidation of emergency situations and their consequences, performance of measures of civil protection within their territories and consist of links conforming to administrative territorial division of these territories.

Sectoral subsystems shall be created by central executive bodies for organization of works on performance of measures of civil protection within the competence.

State system of civil protection shall have three levels: republican, territorial and site-level. Each level, with the exception of site-level shall include:

- managing bodies of civil protection;
- control points, operating duty services;
- advisory and consultative bodies – commissions on prevention and liquidation of emergency situations;
- forces and means of civil protection;

- systems of communication, notification and information support.

Management of the state system of civil protection shall be carried out:

- 1) at republican level – the Government of the Republic of Kazakhstan;
- 2) at territorial level – akims of the relevant administrative-territorial entities;
- 3) at site-level – heads of organizations;
- 4) in sectoral subsystems – heads of central executive bodies.

Managing bodies of civil protection are:

- 1) at republican level:

- authorized body;
- central executive bodies of the Republic of Kazakhstan in sectoral subsystems;

- 2) at territorial level:

- local executive bodies;
- territorial subdivisions of authorized body;
- territorial subdivisions of central executive bodies of the Republic of Kazakhstan in sectoral subsystems;

- 3) at site-level – heads of organizations.

State management in system of civil protection shall be carried out by involvement of all the levels of state system of civil protection. The following regimes of functioning of the state system of civil protection in peace time shall be established:

1) **daily activity regime** – procedure for functioning of the state system of civil protection, its territorial and sectoral subsystems on subordinate territory, characterized by the absence of a threat of occurrence of emergency situations.

In daily activity regime, managing bodies of civil protection shall carry out the following measures:

- forecasting of emergency situations;
- collection, processing and exchange of information on protection of population, facilities and territories from emergency situations;
- development of the action plans on liquidation of emergency situations;
- development and implementation of measures on prevention of emergency situations;
- planning of actions of managing bodies and civil protection forces, organization of preparation and ensuring of their activity;
- training of population to actions in emergency situations;
- propaganda of knowledge in the scope of civil protection;
- creation, placement, storage and replenishment of reserves of material resources for liquidation of emergency situations and their consequences;
- conduct of state control and supervision in the scope of civil protection within the competence.

2) **increased readiness regime** – procedure for functioning of the state system of civil protection, its separate subsystems imposed upon threat of occurrence of emergency situations. The following measures shall be carried out in increased readiness regime by managing bodies of civil protection:

- forecasting of occurrence of emergency situations and their consequences;
- correcting of actions plans on liquidation of emergency situations;
- imposition of twenty-four hour duty of heads and civil servants of managing bodies and civil protection forces in control points when necessary;
- collection, processing and transfer of data on forecasting emergency situations to managing bodies and civil protection forces, informing the state bodies and population on methods of protection against them;
- taking of operational measures on prevention of occurrence and liquidation of emergency situations, reduction of amounts of damage and losses in case of their occurrence, as well as increase of stability and safety of functioning of facilities in emergency situations;
- replenishment of required reserves of material resources created for liquidation of emergency situations and their consequences;
- carrying out of evacuation measures in case of necessity.

3) **emergency situation regime** – procedure for functioning of the state system of civil protection, its separate subsystems, imposed upon occurrence of emergency situation and its liquidation. The following measures shall be carried out in emergency situation regime by managing bodies of civil protection:

- entering (implementation, fulfillment) of action plans into force on liquidation of emergency situations and their correcting;
- forecasting of development of occurred emergency situations and their consequences;
- notifying the heads of central and local executive bodies, organizations, as well as population on occurrence of emergency situations and their consequences;
- organizations of works on liquidation of emergency situations, well-rounded ensuring of actions of forces and means of civil protection, maintenance of public order in the course of their conduct, as well as involvement of forces and means of internal affairs bodies, Armed Forces of the Republic of Kazakhstan, other forces and military formations, public associations and population to liquidation of occurred emergency situations in cases and manner established by the legislation of the Republic of Kazakhstan;
- collection, analysis and exchange of information on situation in the zone of emergency situation and in the course of performing the works on its liquidation;
- organization and maintenance of interaction of central and local executive bodies, organizations on the issues of liquidation of emergency situations and their consequences;
- carrying out of measures on life support of population in emergency situations.

Literature: 1-11 (according to list of the recommended resources).

4.2 CLASSIFICATION OF DANGEROUS AND HARMFUL FACTORS. RADIATION AND CHEMICAL HAZARDS

The purpose of the lecture to introduce students:

- classification of dangerous and harmful factors;
- radiation and chemical hazards.

Plan:

1. Classification of dangerous and harmful factors.
2. Radiation hazard.
3. Chemical hazard.

1. Classification of dangerous and harmful factors

It is important to note that awareness of the existence of hazardous and harmful factors for human life is only the first step to safe life. It is necessary to establish conditions under which these factors lead to undesirable consequences, and divert the possibility of such conditions.

Danger – a negative property of matter, which is detected in its ability to cause damage to certain elements of the universe, a potential source of harm. If it is a danger for humans, this phenomenon, processes, objects, properties, under certain conditions can cause damage to health or life of a person or system that provides the livelihoods of people.

The feeling of danger is also deeply personal tone, which mainly depends on:

- a) The level of social and spiritual development of personality;
- b) Situation and the social system that positively or negatively affects the outlook of the citizen.

With the identification of hazards it should be based on the principle “everything affects everything” that is dangerous, it may be all living things and inanimate, and subject to risk everything living and inanimate.

Sources (carriers) of danger:

- Natural processes and phenomena;
- Elements of the technogenic environment;
- Unsafe human actions.

Dangers exist in space and time and implemented as streams of energy, matter and information. Dangers do not act selectively and have appeared; they affect all financial environment. Reasons why some objects do not suffer from certain hazards, or one suffer more, others less, are the properties of many things.

Nomenclature, a list of possible dangers of over 150 items and is not considered complete. For the purpose of analysis, synthesis and development of measures to prevent negative consequences it is necessary to classify hazards, sources that generate them, and those factors (factors) that directly lead to negative human exposure.

Depending on the specific needs, there are different systems of classification – the source of origin, localization, effects, consequences, damage display area, losses sphere of manifestation, structure, and nature of human exposure to others.

The most successful danger classification of human life by source of origin, all dangers are divided into four groups: natural, technological, socio-political and combined. The first three indicate that the danger of their origin sector belong to three components of the environment, which surrounds person – natural, man-made (material and cultural) and social. A fourth group includes natural and technogenic, natural-social and socio-technological dangers, source of which is a combination of different components of the environment.

Natural sources of danger – are natural objects, natural phenomena and natural disasters which threats to life or health (earthquakes, landslides, mudflows, volcanoes, floods, avalanches, storms, hurricanes, heavy rains, hail, fog, ice, lightning, asteroids, solar and cosmic radiation, dangerous plants, fish, insects, fungi, bacteria, viruses, infectious disease of animals and plants).

Man-made (technogenic) sources of danger – it is above all the dangers associated with using of transport vehicles to the operation of lifting and handling equipment, using of combustible, flammable and explosive substances and materials using processes that occur at high temperatures and high pressure, using electricity, chemicals, various types of radiation (ionizing, electromagnetic, acoustic).

Social sources of danger – are dangers caused by low spiritual and cultural level: vagrancy, prostitution, drunkenness, alcoholism, crime and so on. The sources of these hazards are poor financial status, poor living conditions, strikes, uprisings, and revolutions, conflicts on ethnic, ethnical, racial or religious grounds.

Sources of political dangers - are conflicts on ethnic and interstate levels, spiritual oppression, terrorism, political, ideological, interparty, interconfessional and armed conflict and war.

Some sources of risk has combined character.

This is only a small fraction:

- **natural and man-made hazards** – smog, acid rain, dust storms, reducing soil fertility, the emergence of the desert, and other phenomena generated by human activity;

- **natural and social hazards** – quaint ethnic groups, drugs, epidemics of infectious diseases, sexually transmitted diseases, AIDS, and others;

- **social and technological hazards** – professional morbidity, professional injuries, mental disorders and diseases caused by industrial activity, massive mental disorders and diseases caused by exposure to the subconscious mind and the media and special technical means, substance abuse.

When factors such as habitat, which under certain conditions is harmful to the both people and the life support system of people, resulting in material damage.

Their origin may be affected by factors:

- **physical including energy** (air or water shock wave, electromagnetic, acoustic, ionizing radiation, objects moving at high speed and with high temperature, etc.);

- **chemical** (chemical elements , substances and compounds that affect the body of people, fauna and flora, corrosive, lead to the destruction of habitat sites);

- **biological** (animals, plants, microorganisms);

- **social** (excited crowd);
- **psycho-physiological**.

Depending on the specific effects of damaging factors on humans are in some cases (such as in health and safety) are divided into hazardous and dangerous.

Hazards are called factors such as environment, leading to the deterioration of health, decreased performance, disease and even death because of the disease.

Dangerous factors referred to factors such as environment, leading to injuries, burns, frostbite and other injuries of the organism or its organs and even sudden death.

The correlation between the source of danger, dangerous situation (danger) and hazard are shown in Table 1.

Table 1

Sources of Danger, Dangerous Situation and Affecting Factors

Source danger (risk)	Dangerous situation	Affecting factors
The electrical network	Precipice of power lines, touch of bare contacts, short circuit	Voltage step; Electric current; High temperature; Fire
Flood	High water level flooded a settlement	High water level
Car	Traffic trouble related with a faulty car and drunk driver	A car moving, depending on the type of malfunction

2. Radiation hazard

Ionizing Radiation. Electromagnetic radiation (gamma rays or x-rays) or particulate radiation (alpha particles, beta particles, neutrons, etc.) capable of producing ions, directly or indirectly, in its passage through matter (see Figure 1).

Alpha Particle. A particle emitted spontaneously from the nuclei of some radioactive elements. It is identical with a helium nucleus and consists of two protons and two neutrons; it has an electric charge of two positive units.

Beta Particle. A charged particle emitted from the nucleus of an atom. It has the same mass and negative electric charge as an electron.

Gamma Radiation. Short wavelength electromagnetic radiations of high energy originating in atomic nuclei.

Neutron. An electrically neutral particle of approximately unit mass, presented in all atomic nuclei, except those of ordinary hydrogen.

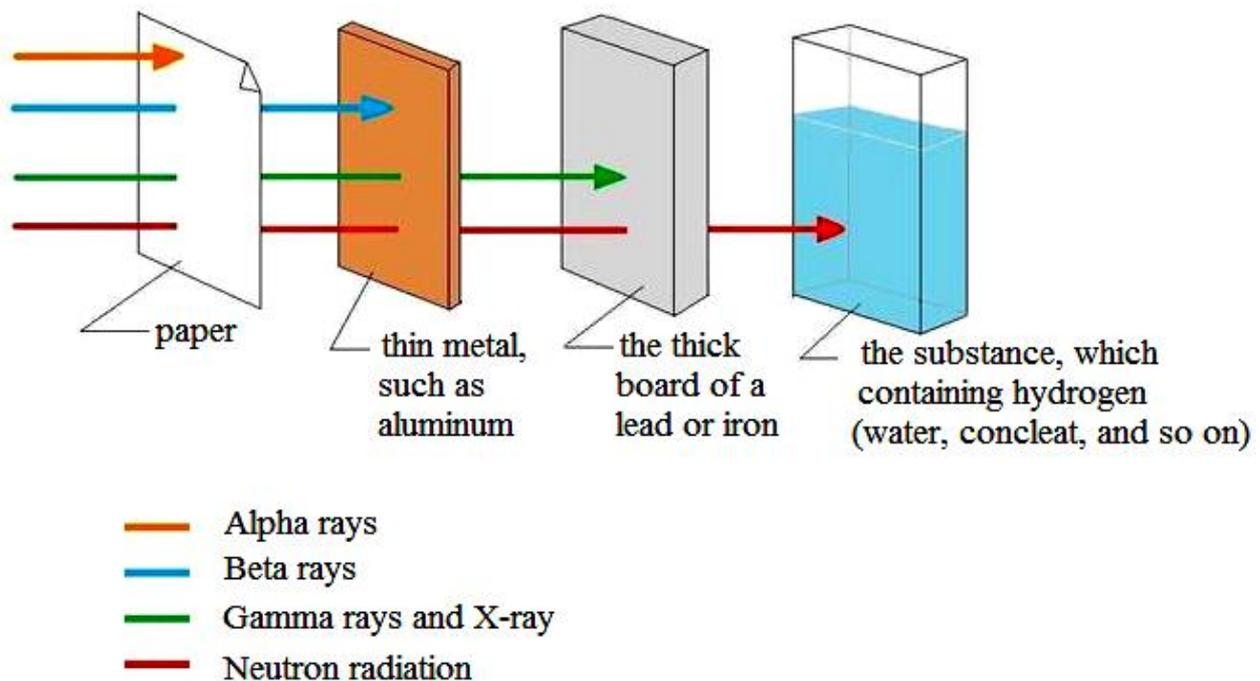


Figure 1 – Types of Ionizing Radiation

There are two general types of ionizing radiation health effects:

1. Somatic effect

Ionizing radiation injuries to body tissues are called somatic effects (see Figure 2 a). Those that occur within a few days or weeks after the beginning of exposure are called “immediate” somatic effects and those that appear thereafter are called “late” somatic effects. Both are usually the result of relatively high radiation doses (> 50 rads) and are most often due to gross negligence. They are rarely seen in the workplace.

Immediate somatic effects can range from barely discernible chromosomal alterations to profound and dramatic radiation sickness.

Late somatic effects include various forms of cancer, reductions in life span and fertility, growth retardation, and cataracts, all known to occur in humans in the absence of significant radiation exposure. Because of the latter and the many other complicating factors involved (e.g., age, tissue and cell radio sensitivity, tissue and organ recovery and repair, exposure time factors, etc.), it is virtually impossible to demonstrate late somatic effects conclusively in individual cases. Their relationship to radiation exposure only can be deduced in carefully designed epidemiologic studies.

2. Genetic effect

Ionizing radiation injury to hereditary material is called genetic effect. Although not apparent in the exposed individual, it may become evident in the transmission of hereditary defects to descendants (see Figure 2 b).

Genetic effects can occur only if the gonads of an individual are exposed to radiation. Resultant damage is to the chromosomes of the reproductive cells. Genes

contained in the chromosomes determine the characteristics and general health of the individual.

Mutation (alteration) in the genes cannot be identified by examination. Only a comparison of the individual's characteristics with those of descendants can reveal such changes. Ionizing radiation is only one of several agents that produce mutations.

Certain chemicals and high body temperatures can cause them. In addition, they can occur spontaneously. Consequently, when an individual exhibits a genetic defect it is extremely difficult to attribute it to parental irradiation.

Dose. The amount of radiation delivered to a specified area or volume or to the whole body.



a



b

a – An acute somatic effect (3 days post exposure). A burn caused by a high dose over a short period of time. This exposure was from a radiation machine.

b – Genetic effect of ionizing radiation

Figure 2 – Somatic and Genetic Effects of Ionizing Radiation

3. Chemical hazard

The hazard associated with a chemical depends on:

- the specific chemical;
- what chemical(s) it is mixed with, if any;
- the relative proportion of the chemical, if it is in a mixture or solution.

Always consider not only what the chemical is, but what concentration you use when evaluate the hazard.

A chemical hazard is a type of occupational hazard caused by exposure to chemicals in the workplace. Exposure to chemicals in the workplace can cause acute or long-term detrimental health effects.

There are many types of hazardous chemicals, including neurotoxins, immune agents, dermatologic agents, carcinogens, reproductive toxins, systemic toxins, asthmagens, pneumoconiotic agents, and sensitizers (see Table 2).

Table 2

Types of Chemical Hazards

Hazard Types	Definition	Examples
1	2	3
Flammable 	Material that will burn or ignite, causing fire or combustion. An ignitable chemical has a flashpoint less than 100° F. A combustible material will burn, but require a flame or elevated temperature plus a spark to start them; and has a flashpoint greater than 100° F but less than 200° F.	<u>Flammables:</u> methanol, acetonitrile, spray adhesive/mount <u>Combustible:</u> diesel fuel, mineral spirits
Corrosive 	Chemical that causes visible destruction of, or irreversible alterations in, living tissue by chemical action at the site of contact. pH < 2 and pH > 12.5	acetic acid, sodium hydroxide, photographic fixer
Reactive 	Material that reacts violently or explodes under either ambient conditions or when in contact with air, water, or other chemicals. <u>Oxidizers:</u> materials that react strongly with organic materials, sometimes strongly enough to start fires <u>Organic Peroxides:</u> form friction and shock-sensitive explosives <u>Water Reactive:</u> react violently with water <u>Air Reactive (pyrophoric):</u> react violently with air <u>Explosive:</u> designed to explode violently	<u>Oxidizers:</u> nitric acid <u>Organic Peroxides:</u> benzoyl peroxide, methyl ethyl ketone peroxide <u>Water Reactive:</u> sodium metal, sodium borohydride <u>Air Reactive:</u> silane, t-butyl lithium <u>Explosive:</u> TNT, picric acid
Toxic 	Material that may cause harm to an individual if it enters the body. <u>Carcinogen:</u> a substance or agent that may cause cancer <u>Mutagen:</u> An agent that can induce or increase the frequency of mutation in an organism <u>Poison:</u> any substance that can impair function, cause structural damage, or otherwise injure the body	<u>Carcinogen:</u> benzene, carbon tetrachloride <u>Mutagen:</u> bromine <u>Poison:</u> sodium azide, powdered pigments and inks (may contain toxic metals such as chromium and barium)

Continuation of Table 2		
1	2	3
	<p><u>Sensitizer</u>: a substance that causes hypersensitivity or reactivity to an antigen, such as pollen, especially by a second or repeated exposure.</p> <p><u>Teratogen</u>: An agent that causes malformation of an embryo or fetus.</p>	<p><u>Sensitizer</u>: formaldehyde, phenol</p> <p><u>Teratogen</u>: PCBs, mercury</p>

Toxic effects of chemical exposure. The effects of exposure to a chemical is dependent on many factors. Those factors include:

- The dose is the amount of a chemical that actually enters the body. The dose of a chemical that a person receives is dependent on the concentration of the chemical, frequency, and duration of the exposure.
- Route of exposure. How the hazardous chemical enters the body determines how the material may travel through the body and effect organs or systems.
- Physical properties of the chemical
- The susceptibility of the individual receiving the dose. No two people are alike; therefore, each person's body will react differently upon exposure. Exposure to a hazardous material may affect one person more than others.

The toxic effects of hazardous materials may be local or systemic. Local injuries involve the area of the body in contact with the hazardous material and are typically caused by reactive or corrosive chemicals, such as strong acids, alkalis, or oxidizing agents. Systemic injuries involve tissues or organs unrelated to or removed from the contact site when toxins have been transported through the bloodstream. Certain hazardous materials may affect a target organ.

The effects materials have upon the body also depend on the acute or chronic toxicity. Acute toxicity results from a single, short exposure and the effects usually appear quickly and are often reversible. Chronic toxicity results from repeated exposure over a long period of time. Effects are usually delayed and gradual, and may be irreversible.

Dose. Poisonous and toxic are not interchangeable terms. All chemicals induce some type of adverse effect at some dose, so all chemicals may be described as toxic. So what chemicals are considered toxic and which are safe? Both! Relatively safe chemicals may become toxic if the dose is high enough, and even potent, highly toxic chemicals may be used safely if exposure is kept low enough. All chemicals are toxic at some dose and may produce harm if the exposure is sufficient, but all chemicals produce their harm under prescribed conditions of dose or usage (see Figure 3).

$$\text{Risk} = \text{Dose} \times \text{Toxicity}$$

The actual health risk of a chemicals is a function of both the toxicity of the chemical and the actual dose (or exposure) someone has to that chemical. No matter

how toxic a chemical may be, there is little health risk involved unless it enters the body. It is important to be aware of the routes of exposure for each chemical and protect that route through appropriate control measures (e.g. fume hood, biosafety cabinet, limiting quantity in use, personal protective equipment).

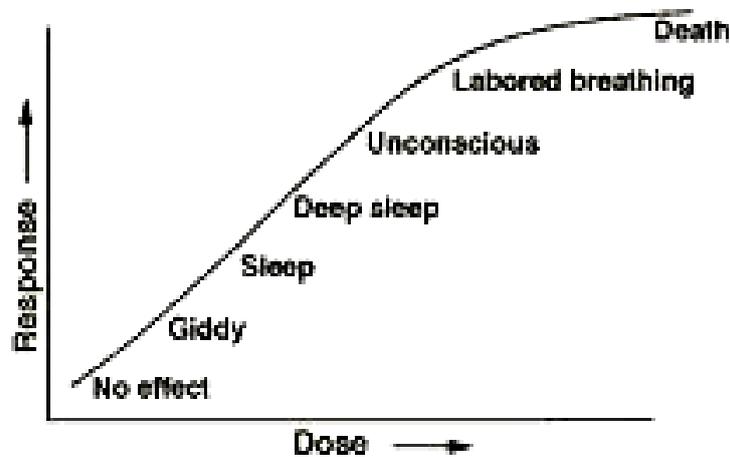


Figure 3 – Dose-response Curve for Alcohol

Evaluating toxicity data. Most estimates of human toxicity are based on animal studies, which may or may not relate to human toxicity. In most animal studies, the effect measured is usually death. This measure of toxicity is often expressed as LD₅₀ (lethal dose 50), which is the dose required to kill 50% of the test population. The LD₅₀ is measured in milligrams of the material per kilogram of the body weight of the test animal. The LC₅₀ (lethal concentration 50) may be used to determine the concentration in air that kills half of the population.

Susceptibility of individuals. Factors that influence the susceptibility of an individual to the effects of toxic substances include:

- nutritional habits;
- physical condition;
- obesity;
- medical conditions;
- drinking and smoking;
- pregnancy.

Due to individual variation and uncertainties in estimating human health hazards, it is difficult to determine a dose of a chemical that is totally risk-free. Regular exposure to some substances can lead to the development of an allergic rash, breathing difficulty, or other reactions. This phenomenon is referred to as sensitization. Over time, these effects may occur with exposure to smaller and smaller amounts of the hazardous material, but will disappear soon after the exposure stops.

Literature: 1-11 (according to list of the recommended resources).

4.3 CURRENT STATE OF A TECHNOSPHERE AND TECHNOSPHERE'S SAFETY

The purpose of the lecture is to introduce students the current state of a technosphere and technosphere's safety.

Plan:

1. Current state of a technosphere.
2. Technosphere's safety.

1. Current state of a technosphere

Technosphere is the part of the environment on Earth where technodiversity extends its influence into the biosphere. Technosphere is the part of the physical environment affected through building or modification by humans (see Figure 4).

Technogenesis is the relation between human's origins and technology, a total of geochemical and geophysical processes connected with human activity.

We live in the world of technical objects, systems and structures. We are surrounded by millions of bridges, causeways, tunnels, dams; thousands of drilling rigs, offshore platforms, millions of cranes, elevators, boilers, tanks, cylinders, basins, reservoirs: hundreds or even thousands of kilometers of water, heat lines, commercial, process, main oil and gas, product pipelines that form current technosphere...

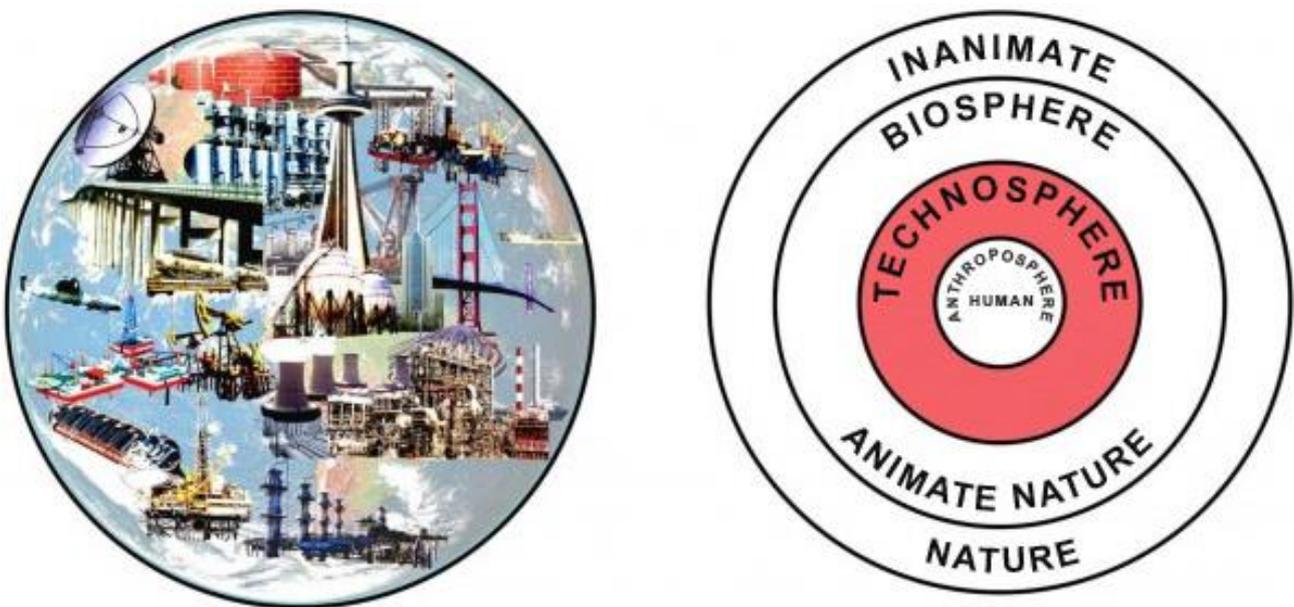


Figure 4 – Technosphere

Cities, deserts, taiga spaces, seas, rivers are filled with technospheric objects at a growing rate. Technosphere has become an integral and defining part of our living environment. Standards and conditions of living as well as human health, environmental conditions, economic security of enterprises and manufacturing,

consistent development of cities, regions and countries depend on the “health” status, uninterrupted operation of technospheric objects, structures and systems.

Bridge damage or destruction in a big city, destruction of heat network or water supply line disarranges sustenance of thousands of people and dozens of businesses.

Break of main gas and oil pipeline leads to environmental disaster and causes economic damage to the countries and regions with so-called “pipe economy” well-being of which is based on oil and gas production, sales and pipeline transfer.

The fundamental operation performed in the technosphere is reacting interaction of material and energy. In any industrial process, implemented in the technosphere during welding, testing, maintenance, repairs the energy – mechanical, electrical, hydraulic, etc. – it is supplied and applied to the material.

The material absorbs and accumulates the energy. The absorbed and accumulated energy loads the material, meanwhile interatomic bonds and atomic and phonon structures of the material are excited, stresses arise. This leads to material deformation, accumulation of damages, defect formation and destruction. All these physical processes are accompanied by material emission and phonon emission.

Emission in the “material-energy” system is generated and exists throughout the technosphere, constantly accompanying the processes of manufacturing, testing, operation and repair of any technospheric objects. It contains current information on the processes taking place in the technospheric objects – deformation, damage, prefracture, real time fracture during their occurrence and performance of technological operations. As a rule, this emission is terminated or is not available when the manufacturing processes, operation or repair of technospheric objects are stopped, paused or terminated. Radiation in the “material-energy” system is a carrier of “intelligence”, “mind” in the technosphere. It “knows” what happens in the technospheric objects, their “health” status, and characterizes their condition. Emission “reports” and “indicates” how and what to do next, what technological action is effective and necessary, what action should be taken. The technosphere is provided with a powerful “intelligence”. Solution of the global technospheric problem is related to the use of this “intelligence” in the technical processes.

2. Technosphere’s safety

Technological progress rapid growth and megalopolis formation resulted in new problems, concerned with technosphere development, directly connected with ecological disturbance of the environment. For successful restoration of the disturbed megalopolis environment balance, it is necessary to define the most dangerous contaminating factors, elimination of which gives the best effect, as well as indicate the actual problems of megalopolis ecosphere security.

Systematic analysis of ecologic situation shows that the most considerable contribution to the pollution of human environment in a megalopolis is made by specific gas emitted by automobiles, plants, living territories polluted by hard domestic wastes (HDW) and constantly generating toxic gas emissions. This ecologic balance disturbances results in processes of toxic chemical substances and dangerous biologic agents secondary synthesis (according to the laws of quantum mechanics),

leading to poisoning of water, soil, food and creating the conditions for pathologically accelerated population ageing.

Megalopolis environment restoration requires determination of the major negative factors, both common and separate for each item, elimination of which effectively reduces ecologic danger. One of the common factors, poisoning megalopolis environment is atmosphere pollution. One should underline the following urgent tasks for megalopolis environmental restoration:

1. Recultivation of territories with unapproved dumps of hard domestic wastes, allotted for houses and household constructions;
2. Quality improvement and volume increase of industrial and domestic drain refinement;
3. Elimination of gas emissions into the atmosphere by plants;
4. Providing the population with the radiation protection and excretion of incorporated radioactive nuclides from the body;
5. Reduce of carcinogenic danger of automobile transport.

If we solve this short list of problems, posing extreme threat to human life and health, it will allow us to weaken the effects of technogenic factors on the megalopolis ecosystem.

For separate items, for example, the territories polluted by hard domestic wastes, the major factor is toxic gas emissions, accompanying the natural organic substances and buried chemical compounds decomposition, generation continuance of which is counted in centuries. It is these gas emissions of toxic, carcinogenic and mutagenic chemical compounds that present the most urgent threat to human life.

Unfortunately, construction technologies, used at limited sites, presupposed changes in relief due to hard domestic waste fill, without taking into account the consequences for the population health. Thus, most living territories of the megalopolis turned out to be on the constantly generating gas and other emissions.

The existing erroneous belief about prevention of hard domestic wastes gas emissions using the method of ground coverage only worsen the situation because there emerge secondary organic substances decomposition reactions which result in additional toxic chemical gas agents generation. It is known that any grounds are transparent for gas phase migration. Dump sediments of HDW generate gas all the year, excreting heat regardless of weather. Even in winter the dumps do not freeze. No matter what is under the ground surface, be it mineral resources or something else – the thing is that it should not excrete poisoning gases, polluting the atmosphere, into the air we breathe in.

The dwellers of the houses, constructed on waste sediments, suffer from developing of the so called toxemic syndromes, gradually leading to tissue function loss, manifested in different clinic symptoms of unclear ethiology and at the same time in pulmonary circulation abnormality, circular disorders in bowels, brain and myocardium, leading to renal insufficiency and liver impairment with encephalic-pathologic coma, brain edema and its strong hypoxia, early ageing and unexpected death.

1992-1993 saw successful performance of pilot industrial programs ordered by Moscow government, which sterilized buried HDW gas generation lying under the living constructions of densely populated districts. The used technology allowed fulfilling the task within 3 months without sophisticated engineering works with high security level by considerable volumes (360000 and 128000 cubic meters) on the depth of 28 meters.

Every day each megalopolis absorbs and excretes huge amount of water. Industrial and household drain treatment, increase of the volume of the treatment, improving the quality of disposal plant construction without additional capital waste gain ever-increasing importance due to accelerated growth of megalopolis and unoccupied territories reduction.

The major criteria of this problem solution are evidently accelerating the drain treatment process and reduction of silt, produced in the process of biologic treatment. Silt utilization, its displacement to the burial places is another factor, disturbing ecologic balance in the environment. Silt of waste disposal plant aero tanks contains all the toxic substances, present in the process of industrial and household drain treatment. Silt transportation and its ventilation on the silt sites pose additional ecologic threat owing to toxic dust atmosphere migration, provoking infectious and other diseases of unclear genesis. One of the variants of this problem complex solution lies in the creation of special microorganisms with predetermined properties. The experiment, carried out in 1991 unambiguously proved the possibility to create specialized silicon microorganisms, with anabiosis properties and proof against temperature changes, bounded with particular geographic coordinates of population inhabitation for stringent control of their spreading out of their own ecosystem of industrial object. The ability of these microorganisms to anabiosis creates restriction for superfluous silt generation.

Thus, both items – increasing efficiency of waste disposal plants and absence of superfluous silt generation – were settled thanks to predetermined ability of the microorganisms to anabiosis under the condition of absence or decrease of contaminants in the water, being their food. According to the experimentally obtained data, we can state that there is a potential opportunity to use the similar method to neutralize toxic compounds of existing waste water disposal plant aeration field.

Literature:

1 Barrett G.W., Odum E.P. The twenty-first century: The world at carrying capacity. // *BioScience*. – 2000. – Vol. 50 (4). – P. 363–368.

2 Naveh Z. Landscape ecology as an emerging branch of human ecosystem science // *Advances in Ecological Research*. – 1982. – Vol. 12. P. 189–237.

3 Palm V., Östlund C. Lead and zinc flows from technosphere to biosphere in a city region // *Science of the Total Environment*. – 1996. – Vol. 192 (1). – P. 95–109.

4 Some solutions for tackling the problems of technosphere and megalopolis environmental safety – Access: <http://www.hesin-tech.com/article5.html>

4.4 CLASSIFICATION OF EMERGENCIES OF VARIOUS CHARACTER. THE BASIC PRINCIPLES AND WAYS OF PROTECTION OF THE POPULATION IN EMERGENCIES

The purpose of the lecture to introduce students:

- classification of emergencies of various character,
- basic principles and ways of protection of the population in emergencies.

Plan:

1. Classification of emergencies of various character.
2. The basic principles and ways of protection of the population in emergencies.

1. Classification of emergencies of various character

However, emergencies are most often classified according to the following types of criteria:

1. Time (description: unexpected, speed of emergency development).
2. Socio-environmental factors (description: human victims, epidemics, mass destruction of the cattle fund, reorientation of the production, use of the considerable quality of natural resources).
3. Socio-economic factors (description big adversity, great hazard, causing the internal political instability, multitude of internal political events, increase of the inter-national tension, prominent international insecurity).
4. Economic factors (description: substantial economic detriments and endangered financial and material resources, disruption of the regular traffic system, necessity of important material expenses and compensation and fund raising, necessity of using a large quantity of techniques for preventing situations and eliminating consequences).
5. Organizational-managerial factors (description: unpredictable situations, complexity of the prognosis of the course of event and selection of solutions, necessity of securing big quantities of different expertise and organizations, unpredictability of the scale of evacuation and rescue services).

Such classifications include classifications that contain the members: local, municipal, regional, national, federal, interstate and global – transnational, i.e. derived by the criterion of the size of the emergency:

- level I – object, facility;
- level II – object, facility, compound;
- level III – (level of the local self-government unit);
- level IV – national level;
- level V – international level.

According to Ibrahim Mohamed Shaluf, emergencies can be classified as follows (see Figure 5):

1. Natural emergencies:

- natural phenomena beneath the earth surface (earthquake, tsunami, volcanic eruptions);

- natural phenomena of the complex physical origin at the earth surface (rockslides, avalanches);
- meteorological-hydrological phenomena (storms, cyclones, typhoons, hurricanes, tornadoes, hail and snow storms, sea bursts, floods, droughts, heat waves/cold waves);
- biological phenomena (overruns – swarms of grasshoppers and bugs, epidemics or infectious diseases – cholera, dengue, Ebola, pox, meningitis, malaria, yellow fever, AIDS, SARS, bird flu).



Figure 5 – Emergencies

2. Man-made emergencies:

- socio-technical emergency situations – technological (fire, poison release, collapse-destruction of buildings, material property), explosions (chemical, nuclear and mine munitions), pollutions (sour rains, chemical pollutions, atmospheric pollutions);

- transport related to emergency situations (air, road, rail and emergency situations at the sea and internal navigable roads);
- emergency situations at stadiums and public places (fire, collapse of civil engineering, stampede of big groups of people);
- emergency situations at production (failure of computer systems, distribution of faulty goods);
- wars – conventional (war between two armies of different countries, riots, blockades), un-conventional (nuclear, chemical, radiological and biological wars).

3. Hybrid emergencies – combined (they are the result of the combination of human error and natural forces):

- Floods that devastate a community located at the known navigable plain,
- Location of settlements, factories, etc. at the foot of active volcanoes,
- Location of settlements, factories, etc. in the areas of snow drifts.

Classification of emergency by Gad-el-Hak is presented in Table 3 and complex typology of emergencies is presented in Table 4.

Table 3

Classification of emergency by Gad-el-Hak

Class	Number of persons killed/ injured/ displaced/ affected	Area of impact (in square kilometer)
Scope I (small disaster)	<10	<1
Scope II (medium disaster)	10-100	1-10
Scope III (large disaster)	100-1000	10-100
Scope IV (enormous disaster)	1000-10 ⁴	100-1000
Scope VI (gargantuan disaster)	>10 ⁴	>1000

Table 4

Complex typology of emergencies

Predictability	Possibility of influence on an emergency	
	Manageable	Non-manageable
Predictable	Conventional emergency	Non-manageable emergency
Unpredictable	Unexpected emergency	Fundamental emergency

A very important classification is of the same origin and relates to:

1. **The character of hazard** – actually the cause of the emergency: technical, biological, natural, environmental and social character;
2. **The frequency rate:**

- most often – earthquakes, transport accidents;
- very often – fires;
- hazards of medium frequency – accidents of communal systems, volcanoes;
- rarest: epidemics, large-scale environmental accidents);

3. **Encompassed territory** (local, municipal, regional, national, federal, interstate and global – transnational) (see Table 5).

Table 5

Typology of emergencies by using penetration and intensity criteria

Emergency penetration	Indicators and values of intensity of emergency			
	Number of casualties in emergency	Number of people with disrupted living and working conditions	Scope of material damage in relation to MPW*	Boundaries of the emergency zones
1	2	3	4	5
Local	Up to 10	Up to 100	1000 MPW at the most	Emergency zone does not stretch out of the borders of the object's territory
Municipal	10-50	100-300	Over 1000, but not more than 5000 MPW	Zone of the emergency does not stretch outside the municipality boundaries
Inter-municipal	10-50	100-300	Over 1000, but not more than 5000 MPW	Zone of the emergency encompasses 2 and more municipalities of one subject of the Russian Federation
Regional	50-500	300-500	Over 5000, but not more than 500000 MPW	Zone of the emergency does not stretch outside the boundaries of the subject of the Republic of Kazakhstan

Continuation of Table 5				
1	2	3	4	5
Inter-regional	50-500	500-1000	Over 500000, but not more than 5000000 MPW	Zone of the emergency encompasses territories of 2 and more subjects of the Republic of Kazakhstan
Federal	Over 500	Over 1000	Over 5000000 MPW	Zone of the emergency does not stretch outside the Russian Federation boundaries
International	Zone of influence of negative factors exceeds the boundaries of the Republic of Kazakhstan or an emergency occurred abroad and included the territory of the Republic of Kazakhstan			
<i>Note: *MPW – minimum price of work</i>				

The INES-scale (International Nuclear and Radiological Event Scale), issued by the International Atomic Energy Agency (IAEA), is a classification scale for the safety significance of nuclear and radiological events (see Figure 6).



Figure 6 – International Nuclear and Radiological Event Scale

This scale is used worldwide and in an event facilitates the communication with the public and the media. The uniform assessment criteria allow for a consistent description of the type and severity of the event and thus result in a common understanding of incidents and accidents.

INES classifies nuclear and radiological incidents and accidents by considering three areas of consideration:

- Radiological consequences outside of the plant;
- Radiological consequences within the plant;
- Impact on safety provisions.

Apart from Level 0 for events without safety significance, the scale classifies events at seven levels, from Level 1 “Anomaly” to Level 7 “Major Accident”.

2. The basic principles and ways of protection of the population in emergencies.

Fundamental safety principles are presented in Figure 7.

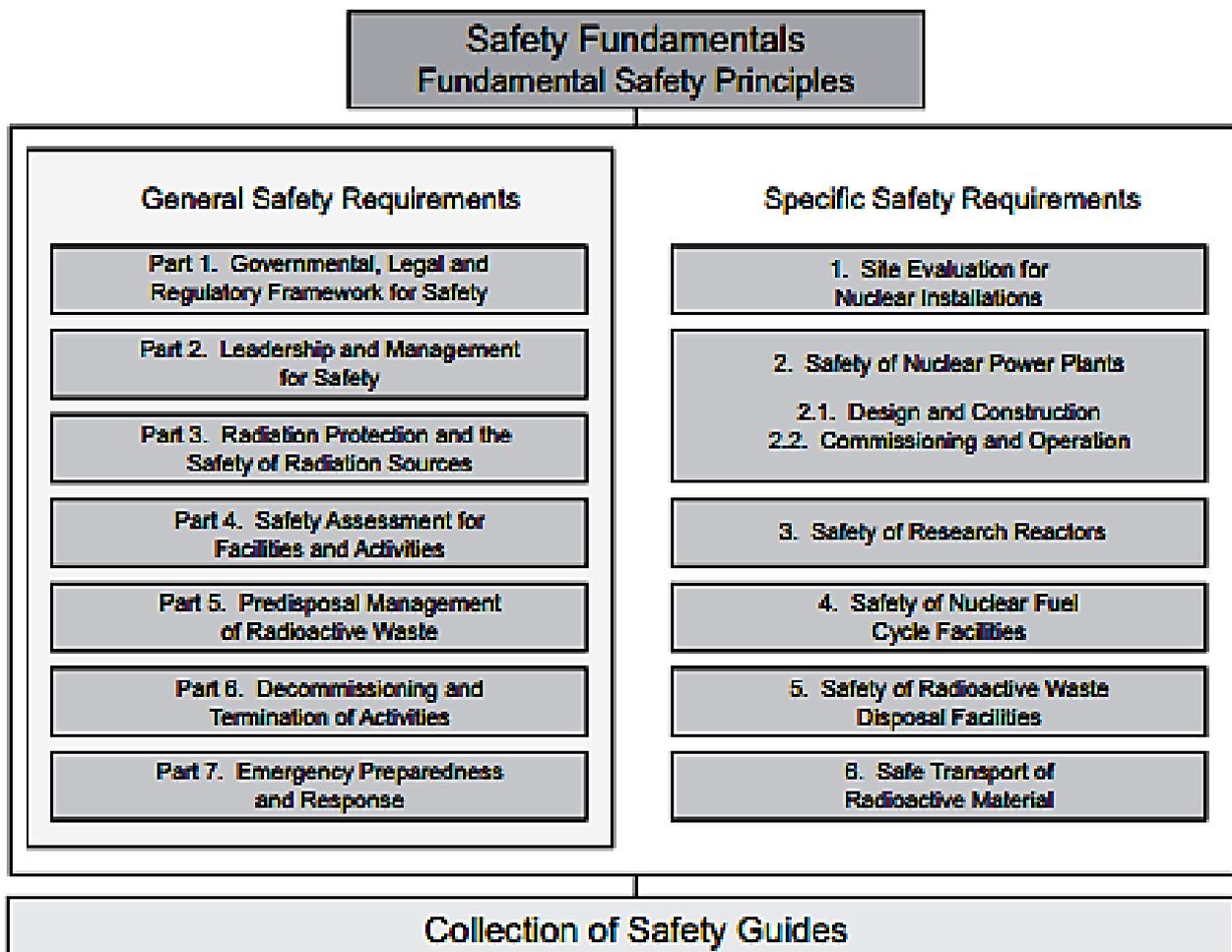


Figure 7 – The long term structure of the IAEA Safety Standards Series

Main tasks of civil protection are:

- 1) prevention and liquidation of emergency situations and their consequences;

2) rescuing and evacuation of people upon occurrence of emergency situations by conduct of accident rescue operations and urgent works in peace and war time;

3) creation of civil protection forces, their preparation and maintenance in instant readiness;

4) training of specialists of central and local executive bodies, organizations and training of population;

5) accumulation and keeping of the required fund of protective structures, stocks of means of individual protection and other property of civil defence in readiness;

6) informing and notifying of population, managing bodies of civil protection in advance in existence of forecasting on threat of occurrence of emergency situation and (or) on an operational basis upon occurrence of emergency situation;

7) protection of food-stuffs, water sources (water supply intake places for economic and drinking purposes), food raw materials, forage, animals and plants from radioactive, chemical, bacteriological (biological) contamination, epizootic and epiphytotics;

8) ensuring of industrial and fire security;

9) creation, development and maintenance of the notification and communication systems in instant readiness;

10) monitoring, development and implementation of measures on reduction of effect or liquidation of hazard factors of modern means of destruction;

11) ensuring of formation, storage and use of the state reserve.

Main principles of civil protection are:

1) organization of the civil protection system on territorial and sectoral principle;

2) minimization of threats and damage to citizens and society from emergency situations;

3) instant readiness of forces and means of civil protection to dynamic response on emergency situations, civil defence and conduct of accident rescue operations and urgent works;

4) publicity and informing of population and organizations on forecasting and occurred emergency situations, taken measures on their prevention and liquidation including liquidation of their consequences;

5) justified risk and safety ensuring upon conduct of accident rescue operations and urgent works.

The basic ways of protection of the population are:

- Shelters in protective constructions;
- Application of means of individual defense and medical protection frames;
- Dispersal and evacuation of the population, workers and employees from cities in a country zone.

When Evacuation is Recommended:

1. Stay calm, you will have plenty of time to evacuate.

2. Without using the phone, make sure your neighbors know about the evacuation.

3. Take only what you need most, including: a print out of this information, clothes, medicine and prescriptions, baby supplies, checkbook and credit cards, portable radio, flashlight, important papers, and household pets.

4. Lock windows and doors. Leave your house as you would if you were going on a short trip.

5. Keep your car's vents and windows closed while driving within 10 miles of the power plant. If you use your car air conditioning, set it on recirculate so it does not pull in outside air.

6. Everyone needs to register at a reception center and be checked for contamination. Registering will aid others in locating you.

7. No firearms or alcohol will be allowed in the reception centers.

8. If you are hurt or sick, go to hospital or ask law enforcement for help.

9. Law Enforcement will be able to help you with other evacuation needs.

10. Evacuated zones will be roadblocked. You must get permission to enter an evacuated zone.

11. When the emergency ends, instructions on returning will be announced over radio stations WBAP, 820 AM.

Literature:

1 Classification of emergencies. – Access: <http://www.jobblockade.de/en/further-information/classification-of-emergencies/>

2 Classification of Emergency Situations. – Access: http://www.academia.edu/11135696/CLASSIFICATION_OF_EMERGENCY_SITUATIONS

3 Protection. – Access: <http://cpnppemergencyinfo.com/protection.html>

4.5 STABILITY OF FUNCTIONING OF THE ECONOMIC FACILITIES IN EMERGENCIES

The purpose of the lecture is to introduce students a stability of functioning of economic facilities in emergencies.

Plan:

1. Stability of functioning of the economic facilities in emergencies

2. Measures and temporary restrictions, applied in the state of emergency

1. Stability of functioning of the economic facilities in emergencies

Economic stability is a term used to describe the financial system of a nation that displays only minor fluctuations in output growth and exhibits a consistently low inflation rate. Economic stability is usually seen as a desirable state for a developed country that is often encouraged by the policies and actions of its central bank

Stability of functioning of the economic facilities in emergencies is the ability of economic facilities to produce products in volume and range corresponding to the plans during emergency situations, as well as adaptation to the recovery facility, destroyed by the emergency situation.

Factors affecting the stability of functioning of economic facilities:

1. The reliable protection of workers from the effects of natural disasters, accidents, and the impact of primary and secondary damaging factors of weapons of mass destruction;
2. The ability of the engineering-technical complex withstand this influences;
3. The reliability of the supply system of object with everything needed for production;
4. The stability and continuity of management of the production and civil defense;
5. The readiness of the object to conduct of search and rescue and other urgent works and restoration of broken production.

2. Measures and temporary restrictions, applied in the state of emergency

The conditions and grounds for introduction of the state of emergency.

The state of emergency shall be introduced in the case when the democratic institutions, independence and territorial integrity, political stability of the Republic of Kazakhstan, the safety of its citizens are under the serious and immediate threat and disturbed the normal functioning of the constitutional organs of the state. The circumstances that are the grounds for the introduction of the state of emergency include:

1) emergencies of a social nature, caused by a massive crossing of the State Border of the Republic of Kazakhstan from the territories of neighboring states; attempts to change the constitutional order of the Republic of Kazakhstan; acts of terrorism; actions, aimed at forcible seizing of power or forcible retention of power in violation of the Constitution of the Republic of Kazakhstan; riots, ethnic and religious conflicts; blockade or capture of individual localities, critical and strategic objects; preparation and activities of illegal armed groups; armed rebellion; diversion; provocative actions by other states to impose an armed conflict; violation of the territorial integrity of the Republic of Kazakhstan;

2) emergencies of natural and technogenic character, caused by natural disasters (earthquakes, mudslides, avalanches, floods, etc.), an environmental health threat, wildfires, epidemics and epizootics, the defeat of crop and forest with pests and diseases, industrial, transport and other accidents, fire (explosions), accidents with emissions (the threat of release) of highly toxic, radioactive and biologically hazardous substances, the sudden collapse of buildings and structures, dam failures, accidents at electric power and communication systems of life support, sewage treatment facilities and those that require early stabilization, law enforcement, creating the conditions for the necessary rescue and recovery work.

The grounds for the introduction of emergency can be a real threat of a natural disaster or large-scale accident (crash) based on the representation of the authorized body in the field of civil protection.

The order of introduction of the state of emergency

1. The state of emergency throughout the territory of the Republic of Kazakhstan or in particular areas is introduced by the President of the Republic of

Kazakhstan by the relevant decree after formal consultation with the Prime Minister and Chairpersons of the Chambers of the Parliament of the Republic of Kazakhstan with immediate informing of the Parliament of the Republic of Kazakhstan.

2. The state of emergency is introduced in case of impossibility to settle this situation by the use of other measures.

3. The Decree of the President of the Republic of Kazakhstan on the state of emergency shall be subject to immediate publication in official publications in accordance with the legislation of the Republic of Kazakhstan and shall be communicated to the population by all means of mass media.

4. The Decree of the President of the Republic of Kazakhstan on the state of emergency shall be enforced within the terms, established by the President of the Republic of Kazakhstan.

The main measures and temporary restrictions, applied in the state of emergency. In the state of emergency the following main measures and temporary restrictions are provided for a period of its validity:

1) strengthening the protection of public order, the protection of critical public and strategic objects, as well as objects that ensure the livelihoods of the population and the functioning of the transport;

2) limitations on the freedom of movement, including vehicles, in areas where the state of emergency is introduced;

3) verification of identity documents of individuals, searches of individuals and their belongings, vehicles;

4) restrictions on entry to the area where the state of emergency is introduced, or to the territory of the Republic of Kazakhstan, as well as leaving them;

5) prohibition or restriction of meetings, rallies and demonstrations, marches and pickets, entertainment, sports and other events, as well as family rituals, associated with birth, marriage, death;

6) prohibition of strikes and other ways of suspension or termination of legal entities;

7) suspension of the activities of legal entities, where the explosives, radioactive, as well as chemically and biologically hazardous substances are used;

8) evacuation of material and cultural values in the safe areas, if there is a real threat to their destruction, stealing or damage due to force majeure;

9) prohibition of elections and referendums for the period of the state of emergency in areas where it is imposed;

10) suspension of networks and means of communications, with the exception of government communications.

Additional measures and temporary restrictions, applied in the state of emergency. When introduction of the state of emergency in the area, where the state of emergency is introduced, the following additional measures and temporary restrictions are provided:

1) the imposition of curfews;

2) control of the media by queries of mandatory copies of publications and materials of radio and television programs;

3) suspension or termination in accordance with legislation of the Republic of Kazakhstan the activities of political parties and public associations, which prevent the elimination of the circumstances giving rise to the state of emergency;

4) restriction or prohibition the use of copying equipment, radio and television broadcasting equipment, audio and video recording equipment, as well as the temporary withdrawal of sound-amplifying means;

5) establishment of a special order of sale, purchase and distribution of food and other basic necessities;

6) limitations on the exercise of certain types of financial-economic activity of individuals and legal entities, including the movement of goods, services and financial resources;

7) restriction or prohibition the sale of firearms, ammunition, explosives, special funds, toxic substances, establishment of a special regime for turnover of medicines, narcotic drugs, psychotropic substances and precursors, as well as ethyl alcohol, alcoholic beverages; 8) temporary withdrawal from individuals of weapons and ammunition, toxic substances, and temporary withdrawal from legal entities, along with weapons, ammunition and toxic substances, as well as combat and training military equipment, explosives and radioactive substances.

Additional measures and temporary restrictions, applied in the state of emergency shall be exercised in accordance with the procedure established by the Government of the Republic of Kazakhstan. When introduction of the state of emergency in the area, where the state of emergency is introduced, the following additional measures and temporary restrictions are provided:

1) temporary resettlement of residents to safe areas, ensuring their temporary accommodation;

2) quarantine, sanitary, anti-epidemic, and anti-epizootic measures;

3) use of the state material reserves in accordance with the legislation of the Republic of Kazakhstan, raising funds of legal entities, changes in their work and a shift towards the production of the necessary in emergency situations products;

4) in cases, related to the need for security and rescue and other emergency operations, involving the working-age population and vehicles of individuals to carry out these works with the mandatory compliance with the labour legislation of the Republic of Kazakhstan.

When introduction of the state of emergency in the area, where the state of emergency is introduced, in exceptional cases, in the absence or insufficiency of the state reserve of logistical, food, medical and other resources, created to provide guaranteed protection of population, environment and business facilities from emergency situations of natural and technogenic character, the requisition of property during emergency situations of natural and technogenic character shall be carried out in the manner prescribed by the Law of the Republic of Kazakhstan “on State Property”.

Literature: 1-11 (according to list of the recommended resources).

PART 5

PLANS OF PRACTICAL (SEMINAR) CLASSES



Practical class No 1

Theme: The purpose and objects of discipline. Place of discipline in the natural sciences. The role of government in ensuring safety. Evolutionary development protective of human activity: safety measures, labor protection, environmental protection, civil defense, protection in the emergency and life safety.

Plan:

1. The purpose and objects of discipline. Place of discipline in the natural sciences.
2. The role of government in ensuring safety.
3. Evolutionary development protective of human activity: safety measures, labor protection, environmental protection, civil defense, protection in the emergency and life safety.

Assignments for students:

1. Determine relationships of life safety with other sciences and connect blocks (see Figure 8) with each other by one-way or two-way links:

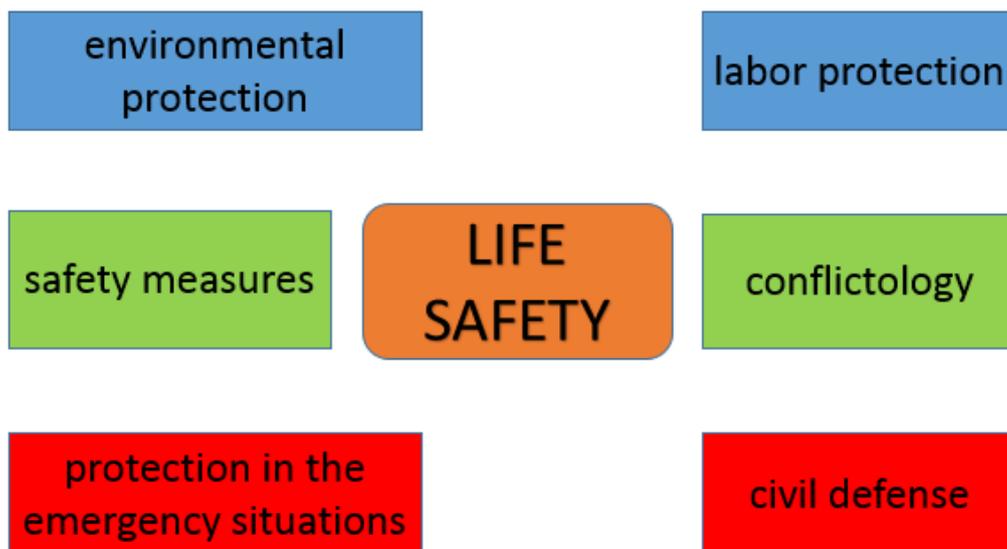


Figure 8 – Life Safety

2. Write an abstract on the topic «The Role of Government in Ensuring Safety» (150-200 words).

3. Evolutionary development protective of human activity: safety measures, labor protection, environmental protection, civil defense, protection in the emergency and life safety (work in small groups for RAFT technology).

Literature: 1-11 (according to list of the recommended resources).

Practical class No 2

Topic: The law of the Republic of Kazakhstan “On state of emergency”.

Plan:

1. The basic definitions, used in Law of the Republic of Kazakhstan “On state of emergency”
2. Legal regime of the emergency of a social nature.
3. The conditions, grounds, and the order of introduction and cancellation of the state of emergency
4. Measures and temporary restrictions, applied in the state of emergency

Assignments for students:

1. Prepare a glossary consisting of the basic definitions, used in Law of the Republic of Kazakhstan “On state of emergency”.
2. What is the purpose of the imposition of emergency?
3. What is the legal regime of the emergency of a social nature? Give examples of legal regime of the emergency of a social nature.
4. Give examples of the conditions, grounds, and the order of introduction and cancellation of the state of emergency.
5. Enumerate measures and temporary restrictions, applied in the state of emergency.

Literature: 1-11 (according to list of the recommended resources).

Practical class No 3

Topic: The Law of the Republic of Kazakhstan “On Civil Protection”.

Plan:

1. The basic definitions, used in Law of the Republic of Kazakhstan “On Civil Protection”
2. State system of civil protection.

Assignments for students:

1. Prepare a glossary consisting of the basic definitions, used in Law of the Republic of Kazakhstan “On Civil Protection”.
2. What are the main tasks and principles of civil protection?
3. What is unified duty dispatch service “112”?
5. Enumerate levels of State system of civil protection.

Literature: 1-11 (according to list of the recommended resources).

Practical class No 4

Topic: Dangerous production and household factors. Classification of dangers. Rationing of the content of harmful substances. Chronic poisonings, occupational and household diseases at effect of toxins.

Plan:

1. Dangerous production and household factors. Classification of dangers.
2. Rationing of the content of harmful substances.
3. Chronic poisonings, occupational and household diseases at effect of toxins.

Assignments for students:

1. Prepare a glossary on the theme “Dangerous Production and Household Factors”.
2. What classifications of dangers do you know? Give examples.
3. How must the rationing of the content of harmful substances be put into practice? Give examples.
4. Tell about types of chronic poisonings and occupational and household diseases at effect of toxins. Give examples.

Literature: 1-11 (according to list of the recommended resources).

Practical class No 5

Topic: Ionizing radiation. External and internal radiation, doses. Their action on a human body. Radiation sickness and other diseases. The basic principles of radiation safety. Classification of radiation facilities by potential danger. Protective measures.

Plan:

1. Ionizing radiation. External and internal radiation, doses. Their action on a human body.
2. Radiation sickness and other diseases.
3. The basic principles of radiation safety.
4. Classification of radiation facilities by potential danger. Protective measures.

Assignments for students:

1. Prepare a glossary on the theme “Ionizing Radiation”.
2. Describe features of external and internal radiation and their impact on a human body. Give examples.
3. Tell about types of radiation sickness. Give examples.
4. Tell about the basic principles of radiation safety and protective measure. Give examples.

5. Give classification of radiation facilities by potential danger.

Literature: 1-11 (according to list of the recommended resources).

Practical class No 6

Topic: Classification of chemically hazardous facilities and chemical emergencies. Methods of protection and personal protective equipment. Evaluation of the consequences of chemical accidents. Devices of chemical reconnaissance.

Plan:

1. Classification of chemically hazardous facilities and chemical emergencies.
2. Methods of protection and personal protective equipment.
3. Evaluation of the consequences of chemical accidents.
4. Devices of chemical reconnaissance.

Assignments for students:

1. Prepare a glossary on the theme “Chemical Hazards”.
2. Give classification of chemically hazardous facilities and chemical emergencies.
3. Tell about types of methods of protection and personal protective equipment. Give examples.
4. How is evaluation of the consequences of chemical accidents realized on practice? Give examples.
5. What kinds of devices of chemical reconnaissance do you know? Give examples.

Literature: 1-11 (according to list of the recommended resources).

Practical class No 7

Topic: Technosphere. Stages, regularities and indicators of development of system.

Plan:

1. What is Technosphere?
2. Stages, regularities and indicators of development of system.

Assignments for students:

1. Prepare a glossary on the theme “Technosphere”.
2. Prepare rebuses on the theme “Technosphere”

3. Tell about stages, regularities and indicators of development of system. Give examples.

Literature: 1-11 (according to list of the recommended resources).

Practical class No 8

Topic: Influence of population explosion, urbanization, growth of power energy, transport, industrial production and other branches of economy on the development of technosphere.

Plan:

1. Influence of a population explosion and urbanization on development of technosphere.
2. Influence of growth of power energy on development of technosphere.
3. Influence of transport, industrial production and other branches of economy on development of technosphere.

Assignments for students:

1. Prepare a glossary on the theme “Influence of Population Explosion, Urbanization, Growth of Power Energy on the Development of Technosphere”.
2. Prepare rebuses on the theme “Transport”
3. Tell about influence of industrial production and other branches of economy on development of technosphere. Give examples.

Literature: 1-11 (according to list of the recommended resources).

Practical class No 9

Topic: Technosphere security systems. The concept about dangerous zones and zones of life activity. The principles of decrease of danger in zones of life activity. Methods of safety’s realization in zones of life activity.

Plan:

1. The concept about dangerous zones and zones of life activity.
2. The principles of decrease of danger in zones of life activity.
3. Methods of safety’s realization in zones of life activity.

Assignments for students:

1. Prepare a glossary on the theme “Dangerous Zones and Zones of Life Activity”.

2. Tell about the principles of decrease of danger in zones of life activity. Give examples.

3. What methods of safety's realization in zones of life activity do you know? Give examples.

Literature: 1-11 (according to list of the recommended resources).

Practical class No 10

Topic: Three main classification of the signs of emergencies: by the sphere of emergence, by departmental affiliation, by the scale of emergency zone. Emergencies of natural and technogenic characters.

Plan:

1. Classification signs of emergencies by the sphere of emergence
2. Classification signs of emergencies by departmental affiliation
3. Classification signs of emergencies by the scale of emergency zone
4. Emergencies of natural and technogenic character.

Assignments for students:

1. Prepare a glossary on the theme "Signs of Emergencies".
2. Prepare rebuses on the theme "Signs of Emergencies"
3. Please, give three main classification of the signs of emergencies.
4. Tell about emergencies of natural and technogenic character. Give examples.

Literature: 1-11 (according to list of the recommended resources).

Practical class No 11

Topic: Principles of protection of the population. Engineering protection in the conditions of peace and wartime.

Plan:

1. Principles of protection of the population.
2. Engineering protection in the conditions of peace and wartime.

Assignments for students:

1. Prepare a glossary on the theme "Principles of Protection of the Population".
2. Prepare a crossword on the theme "Engineering Protection in the Conditions of Peace and Wartime"
3. Please, list principles of protection of the population.

4. Tell about engineering protection in the conditions of peace and wartime. Give examples.

Literature: 1-11 (according to list of the recommended resources).

Practical class No 12

Topic: Protection of the population at natural disasters, during the fires, accidents and explosions in industrial facilities. Geological dangerous phenomena, ways of protection. Earthquakes, classification. The behavior of the population during an earthquake. Organizational and practical safety measures during earthquakes.

Plan:

1. Geological dangerous phenomena, ways of protection.
2. Organizational and practical safety measures during earthquakes.
3. Population’ protection at natural disasters, fire, accidents and explosions in industrial facilities.

Assignments for students:

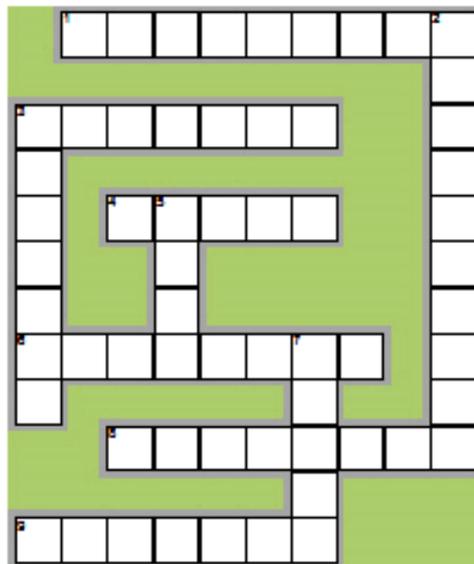
1. Prepare a glossary on the theme “Geological dangerous phenomena, ways of protection”.
2. Solve a crossword on the theme “Natural Disasters”:

Across

1. a very strong wind in west Atlantic
3. tidal wave
4. a large amount of water spread from a river, sea etc. that covers an area that is normally dry
6. a very bad event, causing harm or death
8. move somebody from a dangerous place
9. a long period without rain

Down

2. a sudden violent movement of the ground
3. a strong wind that blows in a circle
5. hot liquid rock
7. (of a volcano) to explode and throw out fire, lava, smoke etc.



Use the words from the crossword to complete the sentences

1. Last night volcano Maui _____ and the hot _____ poured downhill. Since there are two villages located at the foot of the volcano, the local population was _____.
2. The devastation caused by super-storm Sandy, particularly in New York and New Jersey, is tragic, but the _____ has at least put climate change back on the map.
3. After the harshest winter in decades, the Balkans region in the southeast of Europe is now facing its hottest summer and the worst _____ across the area in nearly 40 years.
4. A powerful _____ off the coast of Indonesia sparked a three-metre-high _____ that killed at least 113 people.
5. A landslide caused by rains in southern China left 21 people missing today, adding to a growing death toll from China's worst _____ season in a decade.
6. This summer a dozen _____, which are more common in the US, have hit Europe. The twister which swept through Poland yesterday flattened more than 400 hectares of woodland in the area.
7. The US navy has been deployed to help avert a looming environmental _____ in the Gulf of Mexico.

3. Tell about organizational and practical safety measures during earthquakes. Give examples.

4. How the population at natural disasters, fire, accidents and explosions in industrial facilities must be protected? Give examples.

Literature: 1-11 (according to list of the recommended resources).

Practical class No 13

Topic: Protection against weapons of mass destruction. General characteristic of weapons of mass destruction, its features and consequences of using.

Plan:

1. Protection against weapons of mass destruction.
2. General characteristic of weapons of mass destruction, its features and consequences of using.

Assignments for students:

1. Prepare a glossary on the theme “Weapons of Mass Destruction”.
2. Prepare a crossword on the theme “Weapons of Mass Destruction”
3. How to be protected against weapons of mass destruction? Give examples.
4. Tell about a general characteristic of weapons of mass destruction, its features and consequences of use. Give examples.

Literature: 1-11 (according to list of the recommended resources).

Practical class No 14

Topic: Concept of the stability of functioning. Stability of the functioning of industrial facilities in emergency during peace and wartime.

Plan:

1. Concept of stability of functioning.
2. Stability of functioning of industrial facilities in emergency during peace and wartime.

Assignments for students:

1. Prepare a glossary on the theme “Concept of Stability of Functioning”.
2. Prepare a crossword on the theme “Concept of Stability of Functioning”
3. Tell about stability of functioning of industrial facilities in emergency during peace and wartime. Give examples.

Literature: 1-11 (according to list of the recommended resources).

Practical class No 15

Topic: Bases of the organization and carrying out salvage and rescue operations. Purposes, structure, appointment, organization of carrying out rescue and urgent operations.

Plan:

1. Bases of the organization and carrying out wrecking.
2. Purposes, structure, appointment, organization of carrying out rescue and urgent operations.

Assignments for students:

1. Prepare a glossary on the theme “Salvage and Rescue Operations”.
2. Tell about bases of the organization and carrying out salvage and rescue operations. Give examples.
3. Tell about purposes, structure, appointment, organization of carrying out rescue and urgent operations. Give examples.

Literature: 1-11 (according to list of the recommended resources).

PART 6

METHODICAL RECOMMENDATIONS FOR THE STUDY OF THE DISCIPLINE



6.1 PURPOSE AND OBJECTIVES OF DISCIPLINE

The purpose of discipline – to introduce to the students the bases of safe interaction of the human with the environment and bases of protection against the negative factors in different situations

The main objectives of the discipline is to master the theoretical knowledge and practical skills necessary to create a safe and harmless conditions of vital functions, predicting and adoption of competent decisions.

6.2 HOW TO WRITE AN ESSAY

6.2.1 Writing your essay

1. Research the topic. Go online, head to the library, or search an academic database or read newspapers. You may ask a reference librarian.

- Know which sources are acceptable to your teacher.
- Does your teacher want a certain number of primary sources and secondary sources?
- Can you use Wikipedia? Wikipedia is often a good starting point for learning about a topic, but many teachers will not let you cite it because they want you to find more authoritative sources.
- Take detailed notes, keeping track of which facts come from which sources. Write down your sources in the correct citation format so that you do not have to go back and look them up again later.
- Never ignore facts and claims that seem to disprove your original idea or claim. A good essay writer either includes the contrary evidence and shows why such evidence is not valid or alters his or her point of view in light of the evidence.

2. Analyze well-written essays. In your research, you will probably come across really well written (and not so well written) arguments about your topic. Do some analysis to see what makes them work.

- What claims does the author make?
- Why do they sound good? Is it the logic, the sources, the writing, the structure? Is it something else?
- What evidence does the author present?
- Why does the evidence sound credible? How does the author present facts and what is his/her approach to telling a story with facts?
- Is the logic sound or faulty, and why?
- Why is the logic sound? Does the author back up his/her claims with examples that are easy to follow?

3. Brainstorm your own ideas. Sure, you can use the arguments of others to back up what you want to say. However, you need to come up with your original spin on the topic to make it uniquely yours.

- Make lists of ideas. You can also try mind mapping.

- Take your time. Walk in your neighborhood or local park and think about your topic. Be prepared for ideas to come to you when you least expect them.

4. Pick your thesis statement.

- Look at the ideas that you generated. Choose one to three of your strongest ideas that support your topic. You should be able to support these ideas with evidence from your research.
- Write a thesis statement that summarizes the ideas that you plan to present. Essentially, let the reader know where you are going and why.
- A thesis statement should have a narrow focus include both your topic and what you plan to present. For example, “Although Eli Whitney’s cotton gin ushered in a new era of American prosperity; it also widened the gap in suffering for African-American slaves, who would soon be more in demand, and more exploited, than ever.”
- A thesis statement should not ask a question, be written in first person (“I”), roam off-topic or be combative.

5. Plan your essay. Take the thoughts that you brainstormed and assemble them into an outline. Write a topic sentence for your main ideas. Then, underneath, make bullet points and list your supporting evidence. Generally, you want three arguments or pieces of evidence to support each main idea.

- Topic sentence: “Eli Whitney's cotton gin made life harder on African American slaves.”
- Ex: “The success of cotton made it harder for slaves to purchase their own freedom.”
- Ex: “Many northern slaves were in danger of being kidnapped and brought down south to work in the cotton fields.”
- Ex: “In 1790, before the cotton gin, slaves in America totaled about 700,000. In 1810, after the cotton gin had been adopted, slaves totaled about 1.2 million, a 70% increase.”

6. Write the body of your essay. You do want to think about length here; do not write pages and pages if your teacher wants five paragraphs. However, you should free write to let your thoughts reveal themselves. You can always make them more concise later.

- Avoid sweeping generalizations. Statements such as “_____ is the most important problem facing the world today,” can cause your reader to dismiss your position out of hand if he/she disagrees with you. On the other hand, “_____ is a significant global problem” is more accurate.
- Do not use “I” statements such as “I think.” Likewise, avoid the personal pronouns “you,” “we,” “my,” “your” or “our”. Simply stating your argument with supporting facts makes you sound much more authoritative. Instead of writing, “I found Frum to have a conservative bias,” tell the reader why your statement is true: “Frum displays a conservative bias when he writes...”

7. Come up with a compelling title and introduction. Your title and introduction make people want to read your essay. If your teacher is the audience,

then of course your teacher will read the whole piece. However, if you are submitting to an essay contest or writing an essay for college admissions, your title and introduction have to hook the reader if you want to meet your objectives.

- Skip obvious expressions such as, “This essay is about,” “The topic of this essay is” or “I will now show that”.
- Try the inverted pyramid formula. Start with a very broad description of your topic and gradually narrow it down to your specific thesis statement. Try to use no more than 3 to 5 sentences for short essays, and no more than one page for longer essays.
- Short essay example: “Every year, thousands of unwanted and abused animals end up in municipal shelters. Being caged in shelters not only causes animals to suffer but also drains local government budgets. Towns and cities could prevent both animal abuse and government waste by requiring prospective pet owners to go through mandatory education before allowing them to obtain a pet. Although residents may initially resist the requirement, they will soon see that the benefits of mandatory pet owner education far outweigh the costs.”

8. Conclude your essay. Summarize your points and suggest ways in which your conclusion can be thought of in a larger sense.

- Answer questions like, “What are the implications of your thesis statement being true?”, “What’s the next step?”, “What questions remain unanswered?”
- Your arguments should draw your reader to a natural, logical conclusion. In a sense, you are repackaging your thesis statement in your concluding paragraph by helping the reader to remember the journey through your essay.
- Nail the last sentence. If your title and first paragraph make the reader want to read your essay, then your last sentence makes the reader remember you. If a gymnast does a great balance beam routine but falls on the landing, then people forget the routine. Gymnasts need to “stick the landing,” and so do essay writers.

6.2.2 Revising your essay

1. Wait a day or so and re-read your essay. Get your essay done a couple of days before the due date so that you have time to go back and revise it to make it polished. Avoid turning in a first draft that you have not double-checked for errors.

2. Correct errors related to grammar, punctuation and spelling. Consult a stylebook if you are unsure how to properly use quotation marks, colons, semicolons, apostrophes or commas. Avoid using exclamation points.

3. Check your statements.

- Look for mistakes involving than/then, your/you’re, its/it’s, etc. Make sure you know how to use apostrophes correctly.
- Look for mistakes involving general punctuation. Check for run-on sentences, commas and periods inside quotation marks, as well as sparsely used dashes, colons, and semi-colons.

4. Remove any repetitive or unnecessary words. Vary your language with the help of a thesaurus. Also, consult a dictionary to make sure that you are using unfamiliar words correctly.

- At the same time, try to keep your language short, sweet, and to the point. A thesaurus is a great tool, but do not just use big words to sound fancy. The best essays are clear, concise, and easily understood by a wide audience.
- Focus on writing killer verbs for sentences. Verbs communicate the action in a sentence and drive the action. A great verb can be the difference between a bland sentence and a beautiful one.
- Use adjectives lightly. Adjectives are great descriptive words, but when used indiscriminately, they can burden an essay and make it less readable. Try to let the verbs and nouns do most of the heavy lifting before you focus on adjectives.

5. Avoid colloquial (informal) writing. Do not use contractions or abbreviations (e.g., don't, can't, won't, shouldn't, could've, or haven't). Your essay should have a serious tone, even if it's written in a light or lyrical style.

6. Analyze how your essay flows. Does each sentence lead smoothly to the next? Does each paragraph flow logically to the next? Good connections will help your ideas to flow:

- When events happen in sequence: I first started to realize that I was in the minority when I was in middle school... My realization was confirmed when I proceeded to high school.
- If sentences elaborate on each other, plants need water to survive... A plant's ability to absorb water depends on the nutrition of the soil.
- When an idea contrasts with another idea: Vegetarians argue that land is unnecessarily wasted by feeding animals to be eaten as food... Opponents argue that land being used for grazing would not be able to be used to create any other kind of food.
- If you are relaying a cause and effect relationship: I will be the first person in my family to graduate from college... I am inspired to continue my family's progress through the generations.
- When connecting similar ideas: Organic food is thought to be better for the environment ... local food is believed to achieve the same goals.

7. Cut information that is not specifically related to your topic. You do not want your essay to ramble off-topic. Any information that does not directly or indirectly support your thesis should be cut out.

8. Have someone read your paper aloud to you, or record yourself reading it aloud and play it back. Your ears are sometimes better than your eyes at picking up mistakes in language. The essay should sound like it has a good flow and understandable words.

9. Rewrite any problematic body passages. If needed, rearrange sentences and paragraphs into a different order. Make sure that both your conclusion and introduction match the changes that you make to the body.

6.2.3 Writing a persuasive essay

1. Compose your essay with a clear purpose. A persuasive essay is designed to sway the reader to adopt your point of view about a topic. These are good examples of persuasive essay topics you might write about:

- Whether governments should or should not fund embryonic stem cell research.
- Whether love is a virtue or a vice.
- Why Citizen Kane is the best movie of the 20th century.
- Why American citizens should be forced to vote.

2. Write your essay as though you are conducting a debate. When you speak in a debate, you introduce your topic, list your evidence and draw a conclusion for the people who are listening. A persuasive essay has a similar structure.

3. Collect facts from good sources to justify your opinions. Support your argument with reasoned facts. A well-written essay is great, but a well-argued essay is undeniable.

- In addition to doing research, you can perform empirical experiments including taking surveys, doing interviews or conducting experiments. Survey results or interviews could be great pieces of information to start your essay with.
- Tell a story about the facts. Do not just list the facts; tell a story! For example: “Since the death penalty has been reinstated, more than 140 inmates on death row have been released after evidence proved them innocent. Ask yourself: How would you like to be one of those 140 wrongfully-convicted inmates?”

4. Discuss conflicting opinions. Present the other side of your argument and use logic and facts to show why the other side’s opinion is either inaccurate or not up-to-date.

- For example: “Some people argue that the death penalty acts as a deterrent to crime. Time after time, evidence has disproved this theory. The death penalty, in fact, does not act as a deterrent to crime: The South accounts for 80% of US executions and has the highest regional murder rate.”

5. Tie all your ideas together in a gripping conclusion. Be sure to stress your thesis, or what you are arguing for or against, one last time. Use some of the information you have discussed, or a story you have saved, to color your conclusion a little bit.

6.2.4 Writing an expository essay

1. Choose a subject for your essay. You will be investigating a topic and presenting an argument about the topic based on evidence.

- For example, you could write an expository essay arguing that embryonic stem cell research can lead to cures for spinal cord injuries and illnesses like Parkinson’s or diabetes.
- Expository essays differ from persuasive essays because you are not stating an opinion. You are stating facts that you can back up with research.

2. Select your strategy and structure. Some common strategies and structures for expository writing include:

- **Definitions.** Definition essays explain the meaning of terms or concepts.
- **Classification.** Classification essays organize a topic into groups starting with the most general group and narrowing down to more specific groups.
- **Compare and contrast.** In this type of essay, you will describe either the similarities and differences (or both) between ideas or concepts.
- **Cause and effect.** These essays explain how topics affect each other and how they are interdependent.
- **How-to.** How-to essays explain the steps required for completing a task or a procedure with the goal of instructing the reader.

3. Keep your views unbiased. Expository essays are not about opinions. They are about drawing a conclusion based on verifiable evidence. This means keeping your perspective balanced and focusing on what the facts tell you.

- You might even find that, with new information, you will have to revise your essay. If you started out writing about the scarcity of information regarding global warming, but came across a bunch of scientific evidence supporting global warming, you at least have to consider revising what your essay is about.

4. Use the facts to tell the story. The facts will tell the story itself if you let them. Think like a journalist when writing an expository essay. If you put down all the facts like a reporter, the story should tell itself.

- Do not mess with structure in expository essays. In narrative essays, you can twist and turn the structure to make the essay more interesting. Be sure that your structure in expository essays is linear, making it easier to connect the dots.

6.2.5 Write a narrative essay

1. Tell your story vividly and accurately. A narrative essay recounts an incident that either you or others have experienced. In a narrative essay, you could describe a personal experience in which embryonic stem cell research could have helped you or someone you love conquer a debilitating condition.

2. Include all of the elements of good storytelling.

You will need an introduction, setting, plot, characters, climax and conclusion.

- **Introduction:** The beginning. How are you going to set the story up? Is there something useful or important here that gets mentioned later on?
- **Setting:** Where the action takes place. What does it look like? Which words can you use to make the reader feel like they are there when they read it?
- **Plot:** What happens. The meat of the story, the essential action. Why is the story worth telling?
- **Characters:** Who's in the story. What does the story tell us about the characters? What do the characters tell us about the story?
- **Climax:** The suspenseful bit before anything is resolved. Are we left hanging on the edges of our seat? Do we need to know what happens next?
- **Conclusion:** How everything resolves. What does the story mean in the end? How have things, people, ideas changed now that the end is revealed?

3. Have a clear point of view. Most narrative essays are written from the author's point of view, but you can also consider other perspectives as long as your point of view is consistent.

- Utilize the pronoun "I" if you are the narrator. In a narrative essay, you can use first person. However, make sure that you do not overdo it. In all essays, you sound more authoritative if you state facts or opinions in third person.

4. Make a point. You are telling a story, but the purpose of the story is to make a specific point. Introduce your main idea in your thesis statement, and make sure that all of your story elements tie back to your thesis statement.

- What did you learn? How is your essay an exploration of the things that you learned?
- How have you changed? How is the "you" that started the essay different from the "you" now? Related to, but different from, the "what did you learn?" question.

5. Choose your language carefully. You will use words to evoke emotions in your reader, so choose your words deliberately.

Warning. Avoid plagiarism. Parenthetically reference or footnote all borrowed quotes, facts and ideas that are not your own even if you are rewording them. Most faculty can quickly spot plagiarism, which can be verified either by a search engine or plagiarism-detection software. You can even be charged with plagiarism for reusing material that you have already written as you are expected to create new content every time. Plagiarism is a serious offense in the academic world; students have been expelled from colleges and universities for plagiarism, it is very risky.

6.3 HOW TO PREPARE FOR AN INTERVIEW

An **interview** is a conversation between two or more people where questions are asked by the interviewer to elicit facts or statements from the interviewee.

In this section, we offer you some tips about how to prepare for an interview:

1. Know Yourself. You might think that who can know you best that yourself? Well there are many things that you must have clear about your skills, your career, your goals, your own potential, your plans, etc.; that is why we recommend you to write on a paper some relevant information about you, including:

- What are my skills and abilities?
- What are my strengths and what are my weaknesses?
- What are my most important accomplishments?
- How do my skills and experiences relate to the position and employers' needs?
- Am I willing to relocate?
- What points do I want to be sure to get across during the interview?
- How does this position fit into my career goals?
- Who I'm, what I have and what I can?

You can use these answers to write a paragraph as a presentation of yourself, it's important in most interviews to be able to express your talents, interests and

values to others. This presentation must be brief, including three or five sentences to explain who you are, select carefully the ideas and study them. In this part, you should also study carefully your resume.

2. Prepare Yourself

- Once you got an appointment for an interview it's important to know whom are you going to talk to.
- You must know clearly the information of the job you want to apply; it will be interesting to use a Salary calculator tool to know the salaries for that position.
- Visit the company website to gather information (annual reports, employee handbooks, policy statements, employee newsletters) on the organization.
- Search on the internet the website of the employer and learn some about its information.
- Contact people with similar positions to learn about the career field; try to identify how your skills may apply in that job.
- Investigate the market and the current situation of the products in the company.
- Research some possible questions from the interviewer, we have exclusive sections that include questions and answers; you can prepare also with past interviews successes.
- Search and study interview tips online, you can find this information by navigating in our website.

3. General areas to research:

- Research Company information
- How old is the organization, and what is its history of development?
- Where are the plants, offices, or stores located?
- What are its products or services?
- If the organization sells, what are its markets? Retailers? Wholesalers?
- What are its new products?
- Is it a public or non-profit organization? What purpose does it serve? How is it funded? Whom does it serve? What functions does it perform?
- How does this organization rank in the industry?
- What is the financial status of the company? Last year's sales? Growth record?
- Are there any plans for expansion?
- What is the organizational structure?
- How does the organization fit into the community? To what degree is it committed to solving community problems?
- What problems does the organization need to overcome? (By identifying the problems that the organization faces, you can match your abilities to these ends during the interview).

4. Practice. Now that you are interested in how to prepare for an interview, we have provided the theory that will help only if you put it on practice, so practice with

a peer in order to structure your preparation and get used with giving concise, complete and brief answers. Practice with the possible questions and be sure you are not speaking too slow or fast and if your voice shows confidence and clarity. While practicing, be aware of your body language, record your practices if possible and observe and correct your mistakes. Remember to smile and be yourself; the preparation will help you be confident!

5. Your presentation

- Confirm date, time and place of interview.
- Take with you some copies of your resume; include a list of references (with names, titles, addresses and telephone numbers) and letters of recommendation, if possible.
- Dress appropriately (conservative business attire).
- Be punctual. Plan to arrive early, it would help if you know the place before and know where to park.
- Go to bed early to get up early.

4. HOW TO PREPARE A PROFESSIONAL PRESENTATION

A **presentation** is a reflection of you and your work. You want to make the best possible impression in the short amount of time given you. Presentation is the best possible way to do it. An effective presentation not only requires good content, but also requires a good way to deliver it, so as to maintain the interest of the audience. Steps:

1. While preparing a presentation there are certain basic guiding principles:

- Make it simple.
- Make it clear.
- Do not let the technology dominate the presentation. You want the audience to remember the quality of your research, not your PowerPoint wizardry.

2. We need to take certain points in consideration, while preparing the presentation:

- What are the key points you want to make?
- Who is your audience?
- What are they interested in hearing?
- How familiar are they, with your topic? Do they expect data or concepts?

3. Remember:

A presentation is different from a paper. Do not try to cover everything.

4. Resources of information is key to success.

We must think on:

- What will you cover, what can be eliminated?
- How much detail do you need? (Remember, your time and your audience's attention are limited. For any part of your presentation, ask yourself "So what?")

5. Logistics to be taken care of:

- How big is the hall where you will be speaking?
- How much time will you be given?
- What time of day is your talk?
- Carefully consider if you will depend on anyone else for producing your presentation – allow plenty of lead time.

6. Equipment Needs should also be taken care-of:

- Ask what you will be given and what you must bring with you.
- Consider all equipment you will need
- Internet connection
- Computer
- Microphone
- Software

7. Be prepared for a chalk talk because you never know if/when there will be technical problems.

8. Organize the material introduction:

- Time to sell your idea or research.
- Answer the question, “Why should I listen to you?”
- Establish your personal credibility.

9. Organize the material body:

- Make sure you cover your main points.
- Be concrete. Use examples, statistics, reiteration, comparison.

10. Organize the material conclusion:

- Give a summary.
- Emphasize the most important points.

11. Format of presentation:

- For a presentation in a dark room, choose a dark background with light letters.
- When making slides, use a light background and dark letters.
- Use a big enough font.
- Pick a style and stick with it.
- Keep it short, especially titles.
- Leave empty space. Presenting data.
- Make data/results the focus of your presentation.
- Don't try to include all data
- Use handouts for detailed information, or refer the audience to a website.
- Use color or special effects sparingly and consistently.

12. Practice several times before delivering the actual presentation.

13. And do not forget to be happy about it.

5. HOW TO WRITE A SYNOPSIS

A **synopsis** is a long, in-depth summary of a work that describes the content of that work from beginning to end. Synopses are important when you intend to publish a novel, nonfiction book or journal article. Here is what you need to know about writing a synopsis for each major form of publishable written material.

Method 1. Fiction Synopsis

1. Start strong. The start of your synopsis should include a “hook,” a statement that introduces the concept of your novel in an intriguing enough way to grab or “hook” the reader’s attention.

- The hook often includes information about the setting, as well.
- The goal is to create a strong image in one to three sentences. The agent or editor reading your hook needs to have a clear idea about the conditions responsible for molding your characters.

2. Introduce your main characters near the beginning. As soon as you introduce the conditions surrounding your characters, you need to introduce the protagonist. Within the first paragraph or two, you should also introduce any other major characters.

- When you introduce the main character, include one to two descriptive words capable of defining that character. You should also state how that character fits into his or her surroundings and the role that character will play.
- As you introduce other characters, you should introduce them in relation to the main character. For example, if your main character is named Sarah, you might introduce the antagonist as “Tracy, a popular girl at school who bullies Sarah relentlessly.”
- As a general rule, you should only name three characters: the protagonist, love interest, and antagonist. Any other character you need to mention should only be referred to by his or her role: the father, the teacher, etc.

3. Cover the entire narrative arc, including the end. You need to describe the entire main plot from beginning to end so that the agent or editor knows you are capable of maintaining a strong story throughout the entire novel.

- Do not be tempted to leave the end off in an attempt to “tease” the editor into wanting to read more.
- There are certain plot points you need to hit along the way. You need to describe the inciting incident, or the event that causes your main character to begin his or her journey.
- Once the journey begins, you need to explain the conflict that really propels your main character forward.
- Mention any turning points along the way, especially any moment at which conflict resolution seems impossible.
- Spend at least a full paragraph on the climax.
- End with the resolution.

4. Demonstrate character development and emotion. As you advance the plot, you should also describe any character development your main character goes

through. Explain the mental and emotional state of your protagonist with every new plot twist or event.

- If it helps to advance the plot, you should also explain the thoughts and feelings of the other characters named in your synopsis. For instance, if the love interest is a bad-guy-turned-good, you need to track his emotional progress and romantic feelings so that his switch to the good side makes sense.

5. Polish the synopsis using a strong voice. As often as possible, you should write your synopsis using active voice and third person.

- Third person is generally advised even if your novel itself is written in first person. If you write the synopsis in first person, it might be difficult for the editor to distinguish your voice from the voice of your protagonist.

6. Know when to stop. Usually, a novel synopsis should only be one page long. In an effort to reduce the amount of bulk, there are also a few details you should stop yourself from adding.

- Avoid subplots in your synopsis unless they are crucial to the main plot or unless you have extra space at the bottom of your page.
- Avoid mentioning too much: too many characters, too many events, too many minor plot twists, or too much description. You need to present the essentials of your plot, but every sentence should be concise.
- Resist the urge to editorialize. Avoid introducing scenes with phrasing like, “In one significant scene...”

Method 2. Nonfiction Synopsis

1. Include the basic information. Near the beginning of your synopsis, you should include all the essentials about your nonfiction book, including the title, genre, and length.

- You can either list these elements at the top of your synopsis, separate from the body of the synopsis itself, or you can weave them into a brief introductory paragraph at the start of your formal synopsis.
- Note that the length does not need to be exact. If your book comes to a total of 62,843 words, you can round the number off to 62,000 or 60,000.
- If you are offering a synopsis of a proposed book idea instead of a completed manuscript, estimate how many words you plan to write for your completed book.
- The length of the book can also be disclosed in the final paragraph of the synopsis instead of the first.

2. Briefly describe the concept and its importance. Your concept is an explanation of the idea behind your book or the purpose the book is designed to serve. You should also explain why the book is important enough to be written and published.

- A good way to think about your concept is to recall what your initial thoughts on the subject matter were. Ask yourself what type of book you wanted to write when you set out, and arrange your reflections into a few

sentences. Also, ask yourself why you wanted to write the book in the first place, and form those reflections into a few more sentences.

3. Elaborate on the content. This is, in some ways, a full summary of your book. Expand on the concept of the book, filling in the details to address how you plan to or have already covered the topic of your book.

- You can either address the content of your book as a block of prose, with each paragraph corresponding to a different chapter, or as a list of proposed or written chapters. The latter method is usually preferred.
- Each paragraph or chapter outline in your synopsis should address a different subtopic or portion of your overall topic. Introduce the main idea of the chapter and a few supporting points or questions covered in the chapter.

4. Mention your own credentials. After discussing what your book is about, you need to sell to the publisher your own ability. The best way to do this is to mention any past credentials in the field you are writing about or within the field of writing.

- Regarding your credentials with the topic, you should mention any formal education you have had in the field as well as any professional and personal experience with the topic.
- Regarding writing credentials, you need to state any professional writing training you have received and any past, published books or articles, especially those related to the topic of your current book.

5. Analyze the competition. Mention a few other works that address a similar or related topic and explain, in a few sentences, how yours varies from all of them.

- The main purpose of this portion is to show why your book, specifically, should be added to a collection of books already on the same general topic.
- Doing this also serves a secondary purpose. By mentioning other books in the field, you can demonstrate that you are realistic and knowledgeable about your competition.

6. Suggest who to market the book to and how to do it. A publisher will want to accept a book that can sell. You need to indicate that you know of an audience who will be interested in your book and that you have plans of your own to help market it.

- List both general and specific readerships. A general readership would be something like an age group, gender group, religious group, or ethnicity. A specific readership would be something like a specific profession or organization.
- Regarding ways to market or promote your book, you should list any professional connections you have that can help or any audiences you already have, such as an active blog.

7. Estimate your delivery. Describe how much of your book is already written. If your book is not yet finished, explain how long you expect to take in finishing it.

Method 3. Academic Essay/Article Synopsis

1. Stick to an appropriate length. When writing a synopsis for a research paper or academic journal article, you should aim to make the end result no longer, than one to two paragraphs.

- Understand the function of a synopsis within the academic and professional worlds. A synopsis summarizes the article or essay and lets the reader know if the information is relevant to their needs or otherwise worth reading. As such, it needs to be short enough to read quickly.
- When submitted to a conference, synopses must be submitted before the presentation so that those attending the conference can determine which presentations to listen to. Since many synopses need to be included in the conference materials, each one needs to be fairly short.

2. Maintain a professional tone. The tone of your synopsis should be the same as the tone for your essay or article: clean-cut and intelligent.

- Use third person. First person and second person comes across as being too subjective and biased.
- State factual or scientific information. Do not write about your feelings, and avoid mentioning opinions that are not backed with evidence.

3. Provide an overview of your arguments. Introduce the premise of your essay or article, and then lead into your hypothesis or thesis and the arguments that support it.

- For something like a history or literary article, you need to state your thesis and include a sentence for each of your main supporting points or arguments.
- For a scientific research article, you need to explain what hypothesis you are trying to prove and the method you used to study it, including details about why the method used would present a valid argument or piece of support.

4. State your conclusions. Regardless of the subject or theme, each academic synopsis must state the overall conclusion you reached. Without that conclusion, the reader has no way of knowing whether or not the essay will come together in a sensible, beneficial manner.

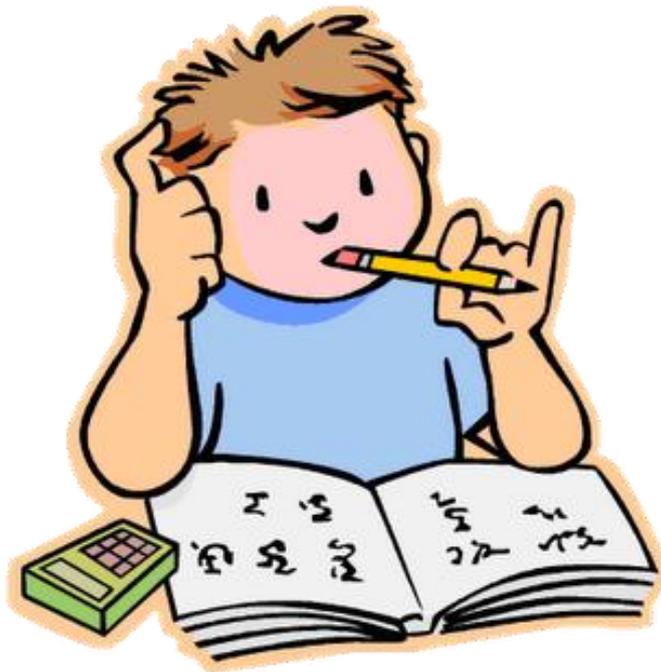
- With literary and history articles, you need to show how all of your arguments lead up to one crucial and seemingly inevitable conclusion.
- With scientific research essays, you need to state the results of your experiment or research and quickly mention how that affects the topic as a whole.

5. Put your synopsis in the right spot. The synopsis should be included after your title page but before the actual essay or article.

- Note that for some writing styles, the term “Synopsis” might be swapped out for the term “Abstract.”

PART 7

MATERIALS FOR INDEPENDENT WORK OF THE STUDENTS



7.1 INFORMATION ON THE ORGANIZATION OF INDEPENDENT WORK OF THE STUDENTS

Dear students here offered the tasks for an independent getting of knowledge and detailed studying of academic material, consolidating acquired knowledge and enhancing creativity.

Fulfilling tasks for the independent work of the students (IWS) will allow you to prepare for the practical classes and exam better. Tasks for IWS (such as writing reports, essays, synopsis in their notebooks, presentations, interview and others) will help you to structure, classify and summarize the learning material.

7.2 TYPES OF INDEPENDENT WORK OF THE STUDENTS

1 Preparation of an essay on the topic of “What Do I Mean About Life Safety?”

Form of control – checking of essay.

If you do not know how to write an essay, refer to Part 6, paragraph 6.2

2 Preparation to interview on the subject of radiation control and monitoring

Form of control – individual interview on the theme “Subject of Radiation Control and Monitoring”.

If you do not know how to prepare for an interview, refer to Part 6, paragraph 6.3

3 Preparation of presentations on separate themes of course

Form of control – assessment of quality of presentation and participation in collective discussion of presentations.

If you do not know how to prepare for a professional presentation, refer to Part 6, paragraph 6.4

4 Preparation of synopsis in notebook on the theme “List of rescue and urgent operations. Bases of management of wrecking and other works”.

Form of control – checking of synopsis.

If you do not know how to write a synopsis, refer to Part 6, paragraph 6.5

5 Preparation for lections

Lecture themes are presented in part 4

6 Preparation for practical classes

Themes of the practical classes are presented in Part 5

7 Preparation for boundary control

Questions for boundary control are presented in Part 8, paragraph 8.1

8 Preparation for exam

Exam questions are presented in Part 8, paragraph 8.2

Deadlines of the tasks of IWS are presented in the table 6.

Table 6

Timetable of the completion of IWS

No	Theme of tasks, types of work	Hours	Resources of information	Form of reporting	Deadlines, week
1	Essay on the topic of “What do I mean about life safety?”	1	1-11 + Internet	Essay	3
2	Radiation control and monitoring. Sanitary and preventive actions.	0.5	1-11 + Internet	Interview	6
3	Technosphere security systems.	0.5	1-11 + Internet	Presentation	9
4	Hydrological emergencies, classification. The behavior of people during floods.	1	1-11 + Internet	Presentation	12
5	List of rescue and urgent operations. Bases of management of wrecking and other works.	0.5	1-11 + Internet	Synopsis in the notebook, colloquium	15
Other kinds of IWS					
	Preparation for lectures (0,5 hour x number of classes)	2,5			
	Preparation for practical classes (1 hour x number of classes)	30			
	Preparation for boundary control (2 hours x 1 boundary control)	4			
	Total hours	40			

7.3 THE LIST OF THE RECOMMENDED RESOURCES

Required resources:

- 1 The Law of the Republic of Kazakhstan “On Civil Protection” dated 11 April 2014 No. 188-V – Access: <http://adilet.zan.kz/eng/docs/Z1400000188>
- 2 The Code of the Republic of Kazakhstan “On public health and health care system” dated on September 18, 2009 No 193-IV – Access: http://adilet.zan.kz/eng/docs/K090000193_/compare
- 3 The law of the Republic of Kazakhstan “On state of emergency” dated 8 February, 2003 No. 387 – Access: http://adilet.zan.kz/eng/docs/Z030000387_

- 4 The Law of the Republic of Kazakhstan “On State Control of Turnover of Particular Types of Weapon” dated 30 December 1998 No. 339 – Access: http://adilet.zan.kz/eng/docs/Z980000339_/compare
- 5 The Law of the Republic of Kazakhstan “On Military Situation” dated 5 March 2003 No. 391 – Access: http://adilet.zan.kz/eng/docs/Z030000391_
- 6 The Law of the Republic of Kazakhstan “On Technical Regulation” dated 9 November, 2004 No.603 – Access: http://adilet.zan.kz/eng/docs/Z040000603_/compare

Supplementary resources:

- 7 Environmental Code of the Republic of Kazakhstan dated 9 January, 2007 No.212 – Access: http://adilet.zan.kz/eng/docs/K070000212_
- 8 Labour Code of the Republic of Kazakhstan dated 15 May, 2007 No. 251 – Access: http://adilet.zan.kz/eng/docs/K070000251_
- 9 The Law of the Republic of Kazakhstan “On countering terrorism” dated 13 July, 1999 No. 416 – Access: http://adilet.zan.kz/eng/docs/Z990000416_
- 10 Kazakh Legislation in English. – Access: <http://www.yurclub.kz/>
- 11 Process Safety and Environmental Protection (Journal) – Access: <http://www.journals.elsevier.com/process-safety-and-environmental-protection/>

PART 8

MATERIALS FOR THE MONITORING AND EVALUATION OF EDUCATIONAL ACHIEVEMENTS OF STUDENTS



8.1 QUESTIONS FOR THE BOUNDARY CONTROL

BOUNDARY CONTROL No 1

1. With the introduction of the state of emergency on the entire territory of the Republic of Kazakhstan or in particular areas, financing the measures to ensure the state of emergency shall go from:

a) The reserve of the Government of the Republic of Kazakhstan and the reserves of the local executive bodies

b) The emergency reserve fund that created in advance

c) The reserves of the local executive bodies

d) The self-financing

e) The reserve of the Government of the Republic of Kazakhstan

2. How is the coverage of costs of public resources at the prevention and liquidation of emergency called?

a) Material support

b) Life-support

c) Technical support

d) Financial support

e) No correct answer

3. How is the document containing the technical, organizational and technological information indicating the danger of industrial object called?

a) Conclusion of the state expertise

b) Declaration

c) License

д) Act

e) Law

4. What kind of economic losses do the costs of acquiring the necessary medicines and equipment in the process of eliminating the consequences of accidents, catastrophes and natural disasters include?

a) Indirect loss

b) Direct loss

c) Medical loss

d) Unilateral loss

e) Reversible loss

5. In what case material and financial resources of the state will be attracted to the liquidation of emergencies? In case of:

a) Local emergency

b) Regional emergency

c) Large-scale emergency or emergency situation with unique characteristics

d) Road accident

e) Local technical situation

6. How is a set of organizational and integrated managing bodies, accident rescue groups and means of civil protection designed for tasks solution on prevention and liquidation of emergencies, integrated functionally in unified system called?

- a) Accident rescue operations
- b) Accident rescue group
- c) Accident rescue service
- d) State system of civil protection
- e) Fund of protective structures of civil protection

7. Most existing anti-radiation drugs are injected into the body in such way that they have time to get into all cells and tissues to possible human exposure. Hours of intake of drugs are determined depending on the method of their injection into the body:

I. Tablet formulations are used for _____ prior to potential exposure:

- 1) 15-20 minutes
- 2) 30-40 minutes
- 3) 1-2 hours

II. Intramuscular injection drugs are used for _____ prior to potential exposure:

- 1) 5 minute
- 2) 10 minute
- 3) 30 minute

8. The content of strontium-90 and cesium-137 becomes zero, and iodine-131 is reduced to ten percent in the contaminated milk in the following actions:

- 1) Boiling
- 2) Separation
- 3) Passing through a layer of ion-exchange resin
- 4) Separating, churning cream, receiving butter and processing it into melted butter
- 5) Flowing through the cellulosic fiber fascicle of STM-A2 (a chelating fibrous sorbent)

9. Protection against the nitrogen dioxide, methyl chloride, carbon monoxide, ethylene oxide provides:

- 1) Gas mask GP-7
- 2) Gas mask DPG-3 complete with gas mask GP-5
- 3) Gas mask DPG-1 complete with gas mask GP-7
- 4) Gas mask PDF-7
- 5) Respirator U-2K

10. After exiting the hearth of nuclear destruction on an uninfected area, you need to proceed as follows:

- 1) Shoes clean of dirt and wipe it with a wet cloth or rag
- 2) Remove the gas mask and deactivate it
- 3) Remove the gloves and, shaking off them, wipe with a wet cloth
- 4) Undergo radiation monitoring

- 5) Remove outer clothing, getting back to the wind gently shake off the dust, and then hang it on a rope, top-down sweep off it by broom, brush and clear the remnants of the dust with a stick
- 6) Remove personal skin protection
- 7) Wash hands with soap and water thoroughly, treat nails, wash face, exposed areas of body, rinse with clean water mouth, nose and throat, wash eyes
- 8) Wash under running water clothes and underwear
- 9) Pass the full sanitary treatment
- 10) Undergo the radiation re-monitoring

BOUNDARY CONTROL No 2

1. A heavy thunderstorm suddenly broke out. You see the approaching intensive lightning. Your actions:

- 1) Hide under a huge tree
- 2) Hide under a rock shelter
- 3) Remain on the open area, not paying attention to the threat
- 4) Find shelter that not stand out on the open area and wait until thunderstorm

is over

2. Moving to the mountains, you get to the avalanche. Without being able to avoid it, you will:

- 1) Try to slide on the your back together with the moving snow along slope
- 2) Try to burrow into the snow and move with the avalanche
- 3) “Float” on the surface of the snow, making strong movements with your

hands

3. In the desert and mountain regions of Central Asia on the roadsides of the caravan ways and mountain passes, you can see the high ridge of stones with sticking out in different directions dry branches that are tied colorful cloths, tapes and lamb legs.

It is a sacred sign “OBO”, which warns you about:

- 1) The source of water
- 2) Proximity to dwellings
- 3) The dangers

4. When driving a private car you are in a strong snowstorm. What do you do in this situation?

1) Turn the car against the wind (if possible), stop the car and cover the engine, hang bright clothes on the antenna, tightly close doors and windows of the car and periodically warming up the engine, waiting for help of rescues or when the snowstorm is over

2) Stop the car and without switching off the engine will wait until the snowstorm is over

3) Stop the car, get out of the car and try to walk to the village

4) Turn the car on the wind (if possible), stop the car and as necessary to warm up the engine, periodically clean it from the snow (thus, the search group will be

easier to find your car), periodically give the sound and light signals

5) Move out from the main road on a country road so as not to suffer when the rescuers will be clearing away roads, stop the car without switching off the engine, hang bright clothes on a pole (or on the antenna), periodically give the sound and light signals and wait until the snowstorm is over

5. The first tremors in the earthquake caught you at home on the ground floor.

What do you do in this situation?

1) Hide under the table, bed or in the wardrobe, shutting your face by hands

2) Jump out of windows or balconies to the ground

3) Move away aside from windows so as not to be injured by fragments of glass

4) Start to prepare “a rescue backpack”, and took it, run out into the street

5) Take the children immediately and run out into the street as soon as possible

6. The water during the flood caught you in the forest. Your actions:

1) Try to climb on any tree or shrub and hang out on it bright clothes

2) Break the branches, tie them in a bundle that can keep a person on the water, take off shoes and tight clothes and try to swim to a dry place

3) Climb on a branch of a tree or hold on the trunk of the nearest tree and wait for help

4) Stay on the place and wait for help

5) Try to swim to a dry place

7. The water during the flood caught you in the field. Your actions:

1) Take off clothes, shoes; and wait for lifting water and then swim with the flow

2) Try to run away from the approaching flow of water at angle of 45 degree to it

3) If there is nearby hay stack (or straw stack) – climb on it

4) Go to a higher place immediately

5) Stay on the place and wait for help

8. What should not be done under the threat of a hurricane?

1) Take fire safety measures

2) Close attic and ventilation hatchways

3) Fix everything that can be carried away by hurricane

4) Seek shelter in a safe and durable shelter

5) Attempt to move to the another settlement

9. What actions of population in an accident on chemically hazardous objects?

1) Take documents, money, things and get out by the specified routes in safe places

2) Stay at home and lock your apartment

3) Stay at home

10. Forest fire got to the village. Your actions:

1) You have to wait for communication from the mass media and act in accordance with the instructions of local authorities and headquarters of civil defense

- 2) You have to take shelter in the stone buildings or to walk out on the large open areas or stadiums
- 3) You have to go quickly along the river or directly in the water
- 4) All of you have to go together along the roads leading away from the fire and to go in the direction to the field, to the river or to the another safe place
- 5) You have to collect the most valuable things, documents, food for the 2-3 days, and supply of drinking water and to come out of the forest fire area, perpendicular to the direction of the wind to a safe place

8.2 QUESTIONS FOR THE EXAM

- 1 Organizational basis of life safety.
- 2 The purpose and objects of discipline.
- 3 Place of discipline in the natural sciences.
- 4 The role of the government in ensuring of safety.
- 5 Evolutionary development protective of human activity: safety measures, labor protection, environmental protection, civil defense, protection in the emergency and life safety.
- 6 Legislative and legal acts in the field of life safety.
- 7 The objectives and principles of construction and functioning of the civil defense in the Republic of Kazakhstan.
- 8 The law of the Republic of Kazakhstan “On state of emergency”.
- 9 The Law of the Republic of Kazakhstan “On Civil Protection”.
- 10 Problems of civil defense.
- 11 The principles of civil defense.
- 12 The organizations and the responsible persons engaged in the realization of actions of civil defense.
- 13 The principles of the organization of civil defense and protection of people in emergencies at industrial facilities.
- 14 Planning of actions for civil defense and emergency situations at facilities.
- 15 Classification of dangerous and harmful factors.
- 16 Radiation and chemical hazards.
- 17 Dangerous production and household factors.
- 18 Classification of dangers.
- 19 Rationing of the content of harmful substances.
- 20 Chronic poisonings, occupational and household diseases at effect of toxins.
- 21 Ionizing radiation.
- 22 External and internal radiation, doses.
- 23 Action of radiation on a human body.
- 24 Radiation sickness and other diseases.
- 25 The basic principles of radiation safety.
- 26 Classification of radiation facilities by potential danger.
- 27 Protective measures against radioactive contamination.
- 28 Radiation control and monitoring.

- 29 Sanitary and preventive actions of radioactive contamination.
- 30 Classification of chemically hazardous facilities and chemical emergencies.
- 31 Methods of protection and personal protective equipment at chemical accidents.
- 32 Evaluation of the consequences of chemical accidents.
- 33 Devices of chemical reconnaissance.
- 34 Protection of the person and the environment from harmful and dangerous factors of a natural and technogenic origin.
- 35 Current state of a technosphere and technosphere's safety.
- 36 Technosphere. Stages, regularities and indicators of development of system.
- 37 Influence of population explosion, urbanization, growth of power energy, transport, industrial production and other branches of economy on the development of technosphere.
- 38 Technosphere security systems.
- 39 The concept about dangerous zones and zones of life activity.
- 40 The principles of the decrease of danger in zones of life activity.
- 41 Methods of safety's realization in zones of life activity.
- 42 Classification of emergencies of various characters.
- 43 The basic principles and ways of protection of the population in emergencies.
- 44 Three main classification signs of emergencies: by the sphere of emergence, by departmental affiliation, by the scale of emergency zone.
- 45 Emergencies of natural and technogenic characters.
- 46 Principles of protection of the population.
- 47 Actions for protection of the population.
- 48 Engineering protection in the conditions of peace and wartime.
- 49 Evacuation of the population.
- 50 Radiation and chemical protection.
- 51 Medical actions at emergencies.
- 52 The first pre-medical aid at emergencies.
- 53 Emergencies of social character.
- 54 Psychological aspects of emergencies.
- 55 Protection of the population at natural disasters.
- 56 Geological dangerous phenomena, ways of protection.
- 57 Earthquakes, classification.
- 58 The behavior of the population during an earthquake.
- 59 Organizational and practical safety measures during earthquakes.
- 60 Fires. Classification of the fires, their dangerous factors.
- 61 General characteristic of the external and internal fires.
- 62 Classification of substances by fire danger.
- 63 The behavior of people in fires.
- 64 Protection of the population at during the fires.
- 65 Categorization of premises on a fire and explosion safety.
- 66 Classification of explosives and mixes.
- 67 Methods and means of protection from a shock wave.
- 68 Safety of the exploitation of high-pressure systems.

- 69 Hydrological emergencies, classification.
- 70 The behavior of people during floods.
- 71 Protection of the population at accidents and explosions in industrial facilities.
- 72 Infectious sickness rate of people, animals and plants.
- 73 Protection against weapons of mass destruction.
- 74 General characteristic of weapons of mass destruction, its features and consequences of using.
- 75 Effects of nuclear explosions: zone of destruction and radioactive contamination.
- 76 Methods and means of protection at radioactive contamination.
- 77 Emergencies when using the chemical weapons.
- 78 Emergencies when using the bacteriological weapons.
- 79 Methods and means of protection when using the chemical weapons.
- 80 Methods and means of protection when using the bacteriological weapons.
- 81 New types of weapons of mass destruction, the methods and means of protection.
- 82 Protective constructions, refuge, shelters.
- 83 Stability of functioning of the economic facilities at the emergencies.
- 84 Concept of the stability of functioning.
- 85 Stability of the functioning of industrial facilities in emergency during peace and wartime.
- 86 The factors influencing on the stability of the functioning of facilities.
- 87 Ways to improve the stability of functioning of the economic facilities in emergencies.
- 88 Ways to improve the reliability of protection of the personnel at the facilities.
- 89 Ways to improve the stability of engineering complex systems and facility management.
- 90 Requirements of the norms of civil defense of industrial and civil facilities.
- 91 Bases of the organization and carrying out salvage and rescue operations.
- 92 Purposes, structure, appointment, organization of carrying out rescue and urgent operations.
- 93 Forces and funds involved for their carrying out.
- 94 List of rescue and urgent operations.
- 95 Bases of the management of salvage and rescue operations and other works.

PART 8

SOFTWARE AND MULTIMEDIA SUPPORT FOR TRAINING CLASSES



**Software and multimedia support for training classes on the discipline
«Basics of Life Safety»
Specialty 5B060800-Ecology**

№	Themes of multimedia support	Length of time, minute	Type of multimedia support	Access
1	2	3	4	5
1.	<p>The Golden Safety Rules For Life This interactive animation tells us about basic safety.</p>	7:08	mp4- video	https://www.youtube.com/watch?v=WWZji1NKv_0
2.	<p>Protect Your Hands - Four Basics - Safety Training Video - Avoid Hand Injuries This interactive animation tells us about four basics for protecting your hands</p>	2:07	mp4- video	https://www.youtube.com/watch?v=-BIx_OsfbCk
3.	<p>How to Operate Fire Extinguisher - Fire Safety Training Fires occur for various reasons and generally cause wholesome damage to life and property. Whilst fire safety plans are well chalked out, it is also important to remember that it spreads swiftly and ravages everything that comes in its path. This sample of fire safety explains how to use a fire extinguisher when faced with this threat.</p>	2:34	mp4- video	https://www.youtube.com/watch?v=w4jHpHoYZhk
4.	<p>Fire Extinguisher Training - PASS - Fire Safety Training Video The use of a fire extinguisher in the hands of a trained adult can be a life and property saving tool. However, a majority of adults have not had fire extinguisher training and may not know how and when to use them. This short video explains how to properly inspect fire extinguishers. It then covers the P.A.S.S. system for proper, effective fire extinguisher usage</p>	2:50	mp4- video	https://www.youtube.com/watch?v=ktrv34zW7-A

1	2	3	4	5
5.	<p>Fire Extinguisher Training Video by Compliance and Safety</p> <p>According to the Occupational Safety and Health Administration (OSHA), more than 200 fires occur in U.S. workplaces on an average day, with annual costs of workplace fires amounting to over \$2 billion. Injury statistics are just as staggering, with more than 5,000 injured every year in fires and explosions on the job. In 2011 alone, 143 workers died as a result of workplace fires.</p>	4:04	mp4- video	https://www.youtube.com/watch?v=tWGKO3CqgWg
6.	<p>Fire Extinguisher Types and Uses A Fire Extinguisher Guide</p> <p>In this fire extinguisher guide we will discuss common fire extinguisher types and uses. Understanding classes, ratings and uses is the first step in selecting the best fire extinguisher for your home, car or place of business.</p>	3:37	mp4- video	https://www.youtube.com/watch?v=uASkD7Dalu8
7.	<p>Fire Safety Training - How to Use a POWDER Fire Extinguisher</p> <p>Short clip from “Fire Training Academy” on how to correctly and safely use a powder based Fire Extinguisher.</p>	0:59	mp4- video	https://www.youtube.com/watch?v=uAalWAUOZI
8.	<p>Fire Safety Training - How to Use a FOAM Fire Extinguisher</p> <p>Short clip from “Fire Training Academy” on how to correctly and safely use a foam based Fire Extinguisher.</p>	1:03	mp4- video	https://www.youtube.com/watch?v=HQckBXM6o-I
9.	<p>Fire Safety Training - How to Use a CO₂ Fire Extinguisher</p> <p>Short clip on how to correctly and safely use a CO₂ based Fire Extinguisher.</p>	1:09	mp4- video	https://www.youtube.com/watch?v=aPhbJ95VGe0
10.	<p>Training Physicians and Medical Students in Emergency Situation Skills</p>	3:33	mp4- video	https://www.youtube.com/watch?v=2aMRiISrWG0

1	2	3	4	5
11.	Seriously Bad Fire Damage This family lost alot of their belongings and their home is badly damaged. It's important to walk thru the proper steps to ensure that the smoke odor is gone forever.	3:51	mp4- video	https://www.youtube.com/watch?v=HsKEZ3RnY4Q
12.	Hurricane Katrina Historic Storm Surge Video - Gulfport, Mississippi Exclusive (Emmy Award) video shot by Mike Theiss from ground zero of Hurricane Katrina's historic 28 foot storm surge that ripped through Gulfport, Mississippi on August 29th, 2005. This video has a time stamp to give a complete and accurate timeline from the Holiday Inn	13:38	mp4- video	https://www.youtube.com/watch?v=-Kou0HBpX4A
13.	Hurricane Katrina Day by Day Follow a day-by-day account of Hurricane Katrina's wrath, from its birth in the Atlantic Ocean to its catastrophic effects: flooded streets, flattened homes, and horrific loss of life.	5:13	mp4- video	https://www.youtube.com/watch?v=HbJaMWw4-2Q
14.	BBC Documentaries 2015 - Worst Hurricane Katrina Disaster in America / Disaster Documentary (full video BBC Documentary) This movie tell us about worst hurricane Katrina disaster in America	1:33:40	mp4- video	https://www.youtube.com/watch?v=Cp1RWhYQdCE
15.	Hurricane Wilma Video - Miami Beach, Florida In 2005 Hurricane Wilma became the strongest Category 5 Hurricane in the Atlantic basin in recorded history with a barometric pressure of 882mb. She slammed the Yucatan Peninsula of Mexico then went on to hit Florida. Mike Theiss of UltimateChase.com captured on video	5:08	mp4- video	https://www.youtube.com/watch?v=QDFK40UMotc
16.	Hurricane Katrina (full video)	42:32	mp4- video	https://www.youtube.com/watch?v=4Fhc0oWxF1Q

1	2	3	4	5
17.	<p>Journey Inside the Eye of a Massive Hurricane</p> <p>A tropical cyclone is a rapidly-rotating storm system characterized by a low-pressure center, strong winds, and a spiral arrangement of thunderstorms that produce heavy rain. Depending on its location and strength, a tropical cyclone is referred to by names such as hurricane, typhoon, tropical storm, cyclonic storm, tropical depression, and simply cyclone.</p>	43:55	mp4- video	https://www.youtube.com/watch?v=h7lazmTqpCc
18.	<p>Force Thirteen LIVE - Hurricane Alex (January 14, 2016)</p> <p>Intending to run 24 hours a day, 7 days a week starting from November 29, 2015. Talking tropics and weather, with other features throughout the day and night. Hurricane Alex becomes a threat in the Atlantic Ocean.</p>	1:41:04	mp4- video	https://www.youtube.com/watch?v=yz3x3s3lBRM
19.	<p>Hurricane ODILE in Cabo San Lucas, Mexico (2014)</p> <p>Cyclone's Hurricane ODILE Chase: Footage from Cabo San Lucas as the violent cyclone smashed the city. Powerful winds destroyed our hotel lobby while we ran for cover</p>	10:09	mp4- video	https://www.youtube.com/watch?v=vyljKCKqZes
20.	<p>Super Hurricanes – Preview</p> <p>This video asks: what are the conditions that can turn an average tropical storm into a destructive monster? While scientists work to identify the diagnostics of super hurricanes, more and more of the world's people are living in proximity to the sea, making them vulnerable to ocean storms. At the same time, the oceans are getting warmer and sea levels are rising, potentially raising the destructive potential of powerful hurricanes and typhoons.</p>	1:15	mp4- video	https://www.youtube.com/watch?v=7RE-oem9WC4

1	2	3	4	5
21.	<p>Super Hurricanes and Typhoons Hurricanes, typhoons, tropical cyclones: they are creatures of tropical seas, sweeping up heat laden waters, converting it to wind, rain, and waves. Why do a rare few evolve into colossal monsters, that leave in their wake a trail of destruction, death, and despair? Do we now face a rising tide of Super Hurricanes and Typhoons?</p>	30:20	mp4- video	https://www.youtube.com/watch?v=7qym7b-qvkE
22.	<p>Hurricane vs. Tornado: What's the difference? What's the difference between a hurricane and a tornado? I'm Storm Shield Meteorologist Jason Meyers. They're both a testament to Mother Nature's fury.</p>	3:21	mp4- video	https://www.youtube.com/watch?v=W0LskBe_QfA
23.	<p>Why Hurricane Categories Make a Difference During a hurricane you usually hear meteorologists refer to its intensity by categories. If you don't know the difference between a category 1 and a category 5 hurricane, The Weather Channel meteorologist Mark Elliot breaks it down for you.</p>	1:50	mp4- video	https://www.youtube.com/watch?v=lqfExHpvLRY
24.	<p>2015 Pacific Hurricane Season Animation Animation from start to finish of the highly active 2015 Pacific hurricane season, including a trio of simultaneous Category 4 storms in Kilo, Jimena, and Ignacio, and also Hurricane Patricia, which became the strongest Western Hemisphere Cyclone to date.</p>	7:17	mp4- video	https://www.youtube.com/watch?v=FNDKDKIMKs
25.	<p>How a hurricane is born - The Science Of Superstorms – BBC A fascinating look at how a little girl walking in the sand of the African desert could cause a hurricane 4000 miles away in the USA.</p>	2:29	mp4- video	https://www.youtube.com/watch?v=4f45jA5UxB0

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26.	<p>Tornado Damage Levels: F0 - F5 In the US, tornadoes were classified according to the Fujita scale from a F0 to an F5. There was also room for an F6, yet we've never had one that destructive.</p> <p>In 2007 the US converted over to a slightly different scale, the Enhanced Fujita scale. It's pretty similar. The scale was revised to reflect better examinations of tornado damage surveys, so as to align wind speeds more closely with associated storm damage. It allowed for better standardizing of what was previously subjective and ambiguous. It also adds more types of structures and vegetation, expands degrees of damage, and better accounts for variables such as differences in construction quality. The old scale lists an F5 tornado as wind speeds of 261-318 mph (420-512 km/h), while the new scale lists an EF5 as a tornado with winds above 200 mph (322 km/h), found to be sufficient to cause the damage previously ascribed to the F5 range of wind speeds.</p> <p>In any case, I made this video about the original Fujita Scale. Just remember that tornados damage is what is used to ESTIMATE wind speed. It's the same with the EF scale.</p>	3:09	mp4- video	https://www.youtube.com/watch?v=gieSbj2svwY
27.	<p>Natural Disasters Forest Fires This video tell us about wild fires.</p>	13:05	mp4- video	https://www.youtube.com/watch?v=vRdsYni60UI
28.	<p>How Forest Fires Affect Our Ecosystem This video asks: How Forest Fires Affect Our Ecosystem</p>	7:49	mp4- video	https://www.youtube.com/watch?v=xOcVkSp_1xg

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29.	<p>Inside The Fire Camera captures video and temperature as a high-intensity crown fire rolls through. From the International Crown Fire Modeling Experiments in the Northwest Territories. (2000)</p>	1:59	mp4- video	https://www.youtube.com/watch?v=zvPa_yEEd4E
30.	<p>Top 10 Most Deadly Natural Disasters Welcome to Top10Archive. From hurricanes, cyclones, and devastating floods and earthquakes, in this video we will look at the top 10 most deadly natural disasters to date. 10. The Quake of 526 9. The 1920 Haiyuan Earthquake 8. The 2004 Indian Ocean Earthquake 7. The Calcutta Cyclone 6. Coringa, India Cyclone 5. The 1970 Bhola Cyclone 4. The Great Tangshan Earthquake 3. The 1556 Shaanxi Earthquake 2. The Yellow River Flood 1. The 1931 Central China Floods</p>	9:11	mp4- video	https://www.youtube.com/watch?v=OSr2aJ2tRAg
31.	<p>Geography Lesson: What is a Volcano? The cycle of lava as a destructive and constructive force, building the structure of volcanoes and powering their devastating impact.</p>	3:14	mp4- video	https://www.youtube.com/watch?v=WgktM2luLok
32.	<p>Top 10 Deadliest Volcanic Eruptions in History This is the top 10 deadliest volcanic eruptions in history. These volcano eruptions destroyed civilizations, plunged global temperatures, and caused global crop failures.</p>	4:14	mp4- video	https://www.youtube.com/watch?v=gRdP9_v3USU
33.	<p>Top 10 Biggest Active Volcanoes On Earth 10 Most Active Volcanoes - Most Active Volcanoes in the world biggest active volcanoes on earth.</p>	5:45	mp4- video	https://www.youtube.com/watch?v=IbuZI5vf8m0

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34.	<p>Peruvian Amazon Natural disasters: Floods and mudslides</p> <p>Large parts of the Peruvian Amazon are under water after torrential rains caused rivers to burst their banks. More than 3,000 families have been affected and a state of emergency has been declared.</p>	2:02	mp4- video	https://www.youtube.com/watch?v=BE9xNwQWXR8
35.	<p>Flood Disaster in Australia: Documentary on Flash Floods in Australia</p> <p>This video tell us about flood disaster in Australia.</p>	41:10	mp4- video	https://www.youtube.com/watch?v=cMHRpK2yjis
36.	<p>Myanmar flooding 2015, natural disaster - Sagaing region, Chin state</p> <p>Our country is in the midst of the worst natural disaster since the 2008 Nargis Cyclone. Death toll has reached 45 and is likely to grow significantly in the coming hours and days with as many as 200,000 people being affected by the flash floods and landslides in the worst hit areas; Chin state, Rakhine state, Sagaing and Magwe regions. The government rightly declared the worst hit areas on 31 July 2015 as “national disaster-affected regions”. The likely costs could easily go up to billions of US dollar, given hundreds of homes, bridges and roads being buried and destroyed by floods and landslides.</p>	6:58	mp4- video	https://www.youtube.com/watch?v=MBqdhLXc-oI
37.	<p>Earthquake Hits Pakistan SwatValley CCTV Footage 26 OCT 2015</p> <p>LIVE CCTV Footage from swat valley Pakistan, People running out for safe place to save their lives. Whole building and cars got shakes In Pakistan earthquake on 26 October 2015. More than 260 people were killed when a magnitude-7.5</p>	2:47	mp4- video	https://www.youtube.com/watch?v=A-0EKPd135c

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	<p>earthquake centered in Afghanistan rocked neighboring Pakistan and rattled buildings as far away as India. The U.S. Geological Survey said the epicenter was in the far northern Afghan province of Badakhshan, which borders Pakistan, Tajikistan and China.</p> <p>The death toll reached at least 263 late Monday. In Pakistan, 228 people were killed, with more than 1,000 injured, while Afghanistan reported 33 dead and more than 200 injured, according to the Associated Press. The Afghan death toll included 12 school girls who died in a stampede fleeing their swaying school in Takhar Province. The Indian-controlled Kashmir region reported two deaths.</p>			
38.	<p>7.7 Earthquake Hits India, Pakistan (26th Oct 2015)</p>	2:35	mp4- video	https://www.youtube.com/watch?v=vM6QHIHWK78
39.	<p>12/30/2015 California Volcanic Earthquakes + Midwest EQ Damage = Major Unrest across US</p> <p>A few hours after making this video, a sizable M4.9 (M4.8 revised) earthquake struck the Pacific Northwest/Washington State near Seattle - Vancouver Canada. The pressure indeed backfilled to the Northwest and released with a larger event as expected!</p>	13:24	mp4- video	https://www.youtube.com/watch?v=rEg3qZOW1Cg
40.	<p>Japan Earthquake (7.0) 14 November 2015 - Buildings move</p> <p>A 7.0-magnitude earthquake struck off the coast of Japan early Saturday morning. The quake, which hit near the country's southwestern islands just before 6 a.m. local time, triggered a small tsunami of about 1</p>	0:35	mp4- video	https://www.youtube.com/watch?v=TeXLhmZ1XrE

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	<p>ft. (30 cm), according to the Japan Meteorological Agency. There were no immediate reports of injuries.</p> <p>There was no threat of a tsunami traveling across the Pacific Ocean to the western coast of North America, the National Tsunami Warning Center said.</p>			
41.	<p>Common Emergency Situations With Kids</p> <p>This video titled “Common Emergency Situations With Kids” has been created with the big idea of portraying the common emergency situations that arise in a household with kids.</p>	1:17	mp4- video	https://www.youtube.com/watch?v=W2fwxHUU6X4
42.	<p>Alpha, Beta and Gamma Radiations</p> <p>This video tell us about a different types of radiation.</p>	2:19	mp4- video	https://www.youtube.com/watch?v=VTHQYjkCqV0
43.	<p>EU Civil Protection: Coordination in Action</p> <p>Working together in Europe and around the world: training, coordinating and responding when disaster strikes around the world.</p> <p>Find out more about how the EU’s Civil Protection Mechanism was created and is used today to ensure Europe is ready for disaster by working together.</p>	5:24	mp4- video	https://www.youtube.com/watch?v=nJgYeoqOYM
44.	<p>Weapons of Mass Destruction</p> <p>United Nations - Weapons of mass destruction – nuclear, biological and chemical – have plagued the human race since their invention – and they still pose a threat today. Terror attacks – and accidents – have spread panic in several countries over recent decades. But there are signs that increased vigilance and cooperation can help create a safer world.</p>	16:14	mp4- video	https://www.youtube.com/watch?v=OX6zxjx1A_4

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45.	<p>Survival Under Atomic Attack - 1951 American Civil Defense Educational Film - WDTVLIVE42</p> <p>The United States Office of Civil Defense released this film in 1951 to explain the dangers of the atomic age threat, the effects of radiation and how to protect oneself if caught in the open or in the home.</p>	8:45	mp4- video	<p>https://www.youtube.com/watch?v=lsHUIxt1iMw</p>

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