



Ministry of Education

Test Blueprint for National Exit Examination to be held in 2015 E.C Band 3: Medicine and Health Science

**Program: - Bachelor of Science Degree in Environmental
Health**

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1. Introduction

The Ethiopian Federal Ministry of Education has announced the implementation of exit exam for all undergraduate program (public and private) starting from 2022/2023 academic year. In order to improve the quality of graduates produced by higher learning institutions, it is aimed to give exit exam evaluate if the students have acquired the required knowledge, skills and attitudes. To implement this, it requires determining competency areas for a specific program, which is already completed. Based on the competency areas prepared, it needs to plan the construction of tests.

Planning of a test is a first and vital step in the construction of an achievement test. An achievement test demands very systematic and careful planning, as a fact that good planning is a symbol of success. Tests are the tools that provide scores that measure level of student learning and study program-learning outcomes. In order to achieve the valid and reliable measurement of student learning and program learning outcomes, the development of valid and reliable test is the mandatory. Test should be able to measure student performance in all dimensions of knowledge, skill, and attitude. The carefully planned test construction contributes to improve the overall quality of the test in terms of test content validity, difficulty level, discrimination power and test reliability. Test preparation is not an easy task; it requires a careful planning and guideline to make the task simple. Test construction needs the preparation of test blue print.

Test blueprint is defined as a complete plan that explains how to develop a test. A test blueprint describes the key elements of a test, including the content to be covered, the amount of emphasis allocated to each content area, and other important features. The term refers to a map or specification of assessment to ensure that the assessment programs

cover all aspects of the curriculum and educational domains over a specified period. It helps curriculum developers/test constructors to match various competencies with the course content and the appropriate modality of assessment. Creating a test blueprint will help you plan which questions to include in your exam and ensure that it adequately assesses the learning objectives of the course.

A test blueprint defines the knowledge and skills you want to assess and will enable you to build purpose-driven, successful assessments. The test blueprint, sometimes also called the table of specifications, provides a listing of the major content areas and cognitive levels intended to be included on each test form. It also includes the number of items each test form should include within each of these content and cognitive areas.

Generally, test blueprint will help to ensure tests:

Appropriately assess the achievement of instructional objectives of the course;

Appropriately reflect key course goals, objectives and the material learned or covered during the instruction period,

Include the appropriate item formats along with the knowledge and skills being assessed; and

Determining the method of assessment to address those objectives; and establishing the amount of emphasis to allocate to each knowledge or skill domain.

Keeping this in mind, the team has prepared this test blueprint document in order to help the test developers or content specialists in their process of valid and reliable test construction. The major points considered in the process of preparing this test blue print guideline were the core competencies that have been already identified for the themes of courses, the course contents, course credit hours, and the learning

outcomes with their corresponding levels of achievement by learning domains.

In line with these, the number of test items that should adequately assess the performance of students in all the content topics will be determined through discussion with the content specialists who construct the blueprint and test for their corresponding study program. Therefore, the main purpose of this document (blueprint) is to give direction on how to develop test items for content specialists so that they can develop a test items for their respective program.

2. Objective/ Significance of Test Blueprint Preparation

Test blueprint preparation is generally opted to assist the preparation of a test that is representative, broadly sampled, and consisting of complete knowledge, attitude, and skill domain expected of BSc degree in Environmental Health on completion of their study program.

The specific objectives of test blueprint are to:

- ❖ Facilitate the construction of a representative and balanced test items for the selected courses in accordance with the competencies identified and validated.
- ❖ Guide test developers or writers to write or set appropriate test items.

3. Expected Profile of the Graduates

- Serve as an Environmental Health Officer at the health service and other relevant institutions.
- Coordinate promotive, preventive and disease controlling programs at various levels of the Ministry of Health and other relevant institutions.
- Work as an expert in outbreak investigation and control of diseases at all levels.
- Expert in policy development and planning in environmental health issues at the national and regional level.
- Monitor and evaluate environmental health activities, services at the national, regional, zonal, and Woreda levels.
- Monitor and evaluate different service delivery and manufacturing companies for fulfilment of environmental quality standards of the country
- Undertake promotive and preventive measures to safeguard the health of the workers with respect to occupational health and safety rules and regulations in different working setup such as industries, enterprises, firms, institutions etc.
- Offer Training, assist and conduct research activities in the environment, environmental health and health related areas
- Inspect public service providing institutions, establishments, industries and residential areas, etc, in order to ensure public health.
- Undertake environmental risks and impacts assessment.
- Involve in planning, zoning, and sanitation activities of towns and cities with municipality.
- Participate in development of standards and guidelines for health and environment.
- Serve as quarantine and hygiene officer in ports and international boundaries.

- Work together with Environmental Protection Agency Offices and other sectors on issues linked to environmental health and safety.
- Experts in vector borne disease epidemiology and control activities.
- Participate actively in the management of health service delivery system.
- Serve in product and environmental quality control activities
- Participate in disaster/emergency management situations
- Play a major role in ecological conservation, rehabilitation and protection of environmental pollutions

4. General Objective

- o Determine water quality parameters and its public health importance and design drinking water safety plan.
- o To explain different orders of Arthropod and vectors of medical importance, describe their public health problems, and Synthesize integrated vector and rodent prevention and control mechanisms.
- o Explain food safety and quality management techniques develop checklist for sanitary inspection, explain the health impacts of GMO, and design food born disease management mechanisms.
- o Explain integrated solid waste management systems and effectively implementation of hierarchies of solid waste management
- o Explain the source and types of hazardous waste, its health impact and apply appropriate management options.
- o To characterize wastewaters, identify its health impact, and design the appropriate treatment options.
- o To identify the sources and types of air pollutant, determine its environmental impact; perform air sampling and analysis to design possible prevention and control options.
- o To comprehend the concept of EIA and perform full EIA report before and during the implementation of the project to avoid/reduce its negative impacts on the environment.

- o To explain toxic substances, differentiate acute and chronic effect of toxicants, and describe their fates on the environment (soil, air, water)
- o To apply appropriate disaster management mechanisms based on the national policy and legal frameworks, identify the role of environmental experts during pre, and post disaster situation.
- o To describe environmental standards for water, wastewater, air and soil, apply appropriate environmental sample collection and analysis methods to perform physical, chemical, and biological analysis.
- o To describe ecological organization, identify ecologic impacts of human being, apply appropriate ecosystem conservation, and monitor water quality using bio-indicators
- o To describe the principles of healthful housing, identify the health impacts of poor housing condition, implement institutional health standards (health facility, recreational areas, school, prison etc).
- o To determine occupational hazards and apply appropriate prevention and control strategies to create conducive working environment.
- o To describe the concepts of environmental health professional ethics and apply their professional oath
- o Differentiate law, environmental health law and policy, and public health laws and identify proclamations, rules, and regulations relevant to the environmental health.

5. Specific Objectives

After completing the courses indicated under the five themes, graduating students of the program will be expected to:

- o Explain the relationship between water and diseases
- o Understand the different techniques of measurement of quality of water
- o Perform laboratory analysis for the common physical, chemical and biological water quality parameters
- o Identify drinking water surveillance parameters
- o Demonstrate the application of water quality guidelines and legislation in water quality management
- o Implement a practical water quality management principle in community water supply system
- o Identify and explain different orders of Arthropod vectors of medical importance
- o Explain the different disease transmission mechanism by arthropods
- o Conduct Arthropod surveillance and specimen identification using appropriate techniques and instruments
- o Describe the biology, ecology and vector capacity of medically important vectors
- o Describe the general control methods of Arthropod insect vector
- o Explain the status and challenges of food safety management in Ethiopia
- o Explain the characteristics of milk, egg, fish and meat related to their safety and quality
- o Develop sanitary inspection format
- o Compare the difference between ISO 2200 and HACCP
- o Differentiate the pros and cons of genetically modified foods
- o Determine the steps involved in the management of food borne diseases epidemic

- o Explain integrated solid waste management systems and hierarchies.
- o Calculate the solid waste generation rate and forecast total solid waste
- o Quantify and characterize solid wastes and propose appropriate management system
- o Design a collection system using stationary container and hauled container systems, hauling route design and models, time components of a collection day and transfer stations.
- o Explain factors affecting the composting process
- o Explain the concepts of resources recovery and waste to energy options in the management of solid wastes
- o Define and identify hazardous waste from waste streams
- o Identify the sources and types of hazardous waste
- o Analyze the public and environmental impacts of hazardous waste
- o Design the appropriate hazardous waste handling, treatment and disposal methods
- o Describe different parameters to characterize wastewater
- o Identify the different options of wastewater treatment
- o Illustrate the public health and environmental importance of wastewater management
- o Demonstrate laboratory analysis of characteristics of wastewater in respect to the different parameters
- o Describe the major categories and sources of air pollution
- o Explain how air pollution affect human health, plants , animals and properties
- o Understand how to collect air sample, analyze, and interpret the results.
- o Compare the different approaches to air pollution control
- o Explain the concepts of environmental and social impact assessment
- o Apply environmental and social impact assessment before and during different projects implementation

- o Evaluate proposed projects in terms of their negative consequences on environment and pollution
- o Generate mitigation or management measures and actions for negative impacts
- o Describe how dose-response curves are generated and the different types of dose-response relationships
- o Describe the derivation of toxicological endpoints, including the LD₅₀, LC₅₀, ED₅₀, NOAEL, and NOAEC
- o Differentiate acute and chronic toxicity and describe the organism factors that influence the magnitude of toxicity
- o Determine bio-concentration and bioaccumulation on organisms and its habitats
- o Describe essential health interventions in different types of disasters
- o Explain the role of environmental health in an emergency.
- o Understand the policy, legal, and frameworks for Ethiopian public health preparedness.
- o Plan for essential health interventions in different types of disasters
- o Plan for epidemiological surveillance in disasters situations.
- o Demonstrate how environmental health infrastructure and practices are central to disaster management activities
- o Describe the different environmental standards for water, wastewater, air and soil
- o Demonstrate on how to undertake sampling from different environmental compartments for environmental laboratory analysis
- o Perform physical, chemical analysis of water and wastewater using standard methods
- o Identify major macroinvertebrates that have pollution indicator value for water quality control in water bodies, such as rivers
- o Describe hierarchy of ecological organization
- o Explain about ecological succession
- o Describe the impacts of human population on environment
- o Demonstration the how to conserve natural ecosystem

- o Discuss Basic principles of healthful housing
- o Identifying the problems related to hygiene and sanitation
- o Discuss about Institutional health and Recreational health
- o Planning for the improvement of institutional hygiene and sanitation
- o Select the proper site for residential, commercial, industrial and recreational purposes
- o Develop Strategies for assessing and improving institutional hygiene
- o Apply proper preventive and corrective measures that contribute towards safeguarding health at family and institution levels
- o Identify and characterize occupational hazards
- o Measure and analyze the level of occupational hazards
- o Anticipate, Recognize, Evaluate and control workplace hazards
- o Describe occupational hazards prevention and control methods
- o Carry out risk assessment
- o Identify moral obligations and related problems in practical application of the profession.
- o Distinguish between the roles that morals, ethics and law have on public health.
- o Propose professional ethical oath and codes for the Environmental Health Professional
- o Define law, environmental health law and policy, public health laws and other terms relevant to Environmental Health.
- o Discuss the Ethiopian Environmental and public health laws and sectoral laws related to environmental health.
- o Identify existing proclamations, rules, and regulations relevant to the environmental health practitioner.

Table 1: Expected Competencies to be achieved based on the three domains of learning (KSA)

• Areas of Competency	Expected Competencies to be achieved
• Knowledge	Graduates will be expected to:

	<ul style="list-style-type: none"> • Grasp basic environmental health concepts to serve at the health service and other relevant institutions; • Comprehend the basic theories to play a role in ecological conservation, rehabilitation and protection of environmental pollutions • Acquire with basic concepts in policy development and planning in environmental health issues at the national and regional level • Acquire basic theories to monitor and evaluate different service delivery and manufacturing companies for fulfilment of environmental quality standards of the country • Understand basic theory of promotive and preventive measures to the health of workers with respect to occupational health and safety rules and regulations in different working setup such as industries, enterprises, firms, institutions, etc. • Acquire basic concepts to participate in the development of standards and guidelines for health and environment
Skill	<ul style="list-style-type: none"> ➤ Apply methods of outbreak investigation and control of diseases at all levels ➤ Design strategies to coordinate promotive, preventive and disease controlling programs at various levels of the Ministry of Health and other relevant institutions. ➤ Apply methods of environmental risks and impacts assessments ➤ Design the methods to monitor and evaluate environmental health activities, services at national, regional or local, regional and District levels ➤ Use both quantitative and qualitative environmental and public health research skills ➤ Demonstrate basic environmental health concepts to play a role in ports and international boundaries ➤ Apply skills to offer trainings on topics related with environment and public health ➤ Demonstrate vector-borne diseases epidemiology and control activities ➤ Use appropriate methods to inspect public service providing institutions, establishments, industries, and residential areas, etc. in order to ensure public health ➤ Apply disaster/emergency management situations ➤ Design appropriate methods to serve in product and environmental quality control activities
Attitude	<ul style="list-style-type: none"> ✓ Appreciate working with other professionals or organizations for better outcome satisfy ✓ Initiate relationships to work with Environmental Protection Agency offices and other sectors on issues linked to environmental health and safety ✓ Appreciate to actively participate in the management of health service delivery system ✓ Participate in planning, zoning and sanitation activities of towns and cities with municipality

6. Themes and list of courses

Table 2: Themes and list of courses identified for exit examination for BSc degree in Environmental Health

Sr. No.	List of Themes	List of Courses	Course Code	Cr. Hr.	ECTS
1	Water supply, health promotion and disease control	Water supply	EnvH 3131	2	3
		Medical entomology and vector control	EnvH 3083	2	3
		Food safety management	EnvH 3086	4	7
Total				8	13
2	Waste management	Solid waste management	EnvH 3151	3	5
		Hazardous waste management	EnvH 3152	1	2
		Wastewater management and engineering	EnvH 3133	3	5
		Air pollution management	EnvH 3142	3	5
Total				10	17
3	Environmental risk and impact assessment	Environmental and social impact assessment	EnvH 4172	2	3
		Toxicology	EnvH 4094	2	3
		Health emergency and disaster risk management	EnvH 4095	2	3
Total				6	9
4	Ecology and environmental pollution management	Environmental sampling and quality analysis	EnvH 3144	3	5
		Ecology	EnvH 2141	2	3
Total				5	8
5	Residential and occupational health	Residential and institutional health	EnvH 3161	2	3
		Occupational health and safety	EnvH 4162	3	5
Total				5	8
6	Environmental health law, policy and ethics	Environmental health professional ethics	EnvH 4183	1	2
		Environmental health law and policy	EnvH 4171	1	2
Total				2	4

7. Total credit hour of the selected courses

Table 3: Total credit hour of the selected courses for exit examination for BSc degree in Environmental Health

S.No	List of Courses	Course Code	Cr. Hr.	ECTS
1.	Water supply	EnvH 3131	2	3
2.	Medical entomology and vector control	EnvH 3083	2	3
3.	Food safety management	EnvH 3086	4	7
Total			8	13
4.	Solid waste management	EnvH 3151	3	5
5.	Hazardous waste management	EnvH 3152	1	2
6.	Wastewater management and engineering	EnvH 3133	3	5
7.	Air pollution management	EnvH 3142	3	5
Total			10	17
8.	Environmental and social impact assessment	EnvH 4172	2	3
9.	Toxicology	EnvH 4094	2	3
10.	Health emergency and disaster risk management	EnvH 4095	2	3
Total			6	9
11.	Environmental sampling and quality analysis	EnvH 3144	3	5
12.	Ecology	EnvH 2141	2	3
Total			5	8
13.	Residential and institutional health	EnvH 3161	2	3
14.	Occupational health and safety	EnvH 4162	3	5
Total			5	8
15.	Environmental health professional ethics	EnvH 4183	1	2
16.	Environmental health law and policy	EnvH 4171	1	2
Total			2	4
Grand Total credit hour of selected courses			36	59

8. Share of the Themes/Courses/Items in Percentage (%)

- o Share of themes (T) = $\frac{a}{b} \times 100$, Where “a” is the credit hour of a theme and “b” is the total credit hour of the program. Credit hour of a theme is the sum of credit hours of courses in the theme.
- o Share of courses per theme (C) = $\frac{\text{Credit hour of the course}}{\text{Credit hour of the theme}} \times 100$
- o Share of items per course = $\frac{\text{Share of the course} \times \text{Total number of items}}{\text{Total number of items}}$
- o knowledge, skill and attitude

Table 4: Share of the themes (courses/items in %) for exit examination for BSc degree in Environmental Health

Themes	Course Name	Learning Outcome	Cred it hour	Weight of course or proporti on	Numbe r of test items from each course	Learning outcomes								Share of course in %
						Cognitive						Affective	Psychomotor	
						Rememberi	Understand	Application	Analysis	Evaluation	Creation/ Combination			
Water supply, health promotion and disease control (22.2%)	Water supply (25%)	Explain the relationship between water and diseases	2	2/8=0.25	0.25*22.2 = 6		1		1				4	6
		Understand the different techniques of measurement of quality of water												
		Perform laboratory analysis for the common biological water quality parameters												
		Perform laboratory analysis for the common physical water quality parameters												
		Perform laboratory analysis for the common chemical water quality parameters												
		Identify drinking water surveillance parameters												
		Demonstrate the application of water quality guidelines and legislation in water quality management												
		Implement a practical water quality management principle in community water supply system												
	Medical entomology and vector control (25%)	Explain different orders of Arthropod vectors of medical importance	2	2/8 = 0.25	0.25*22.2=6		2	1	1	1			1	6
		Explain the different disease transmission mechanism by arthropods												
		Conduct Arthropod surveillance and specimen identification using appropriate techniques and instruments												
		Describe the biology, ecology and vector capacity of medically important vectors												
		Describe the general control methods of Arthropod insect vector												
Food safety and	Explain the status and challenges of food	4	4/8=	0.50*22		3	4	1			1	2	11	

	quality management (50%)	safety management in Ethiopia	8	0.50	.2 = 11									
		Explain the characteristics of milk, egg, fish and meat related to their safety and quality												
		Develop sanitary inspection format												
		Compare the difference between ISO 2200 and HACCP												
		Differentiate the pros and cons of genetically modified foods												
		Determine the steps involved in the management of food borne diseases epidemic												
	Total		8											
Waste management (27.8%)	Solid waste management (30%)	Calculate the solid waste generation rate and forecast total solid waste	3	$\frac{3}{10} = 0.30$	$0.3 \times 27.8 = 8$		2		2		2		2	8
		Quantify and characterize solid wastes and propose appropriate management system												
		Design a collection system using stationary container and hauled container systems, hauling route design and models, time components of a collection day and transfer stations												
		Explain factors affecting the composting process												
		Explain the concepts of resources recovery and waste to energy options in the management of solid wastes												
	Hazardous waste management (10%)	Define hazardous waste from waste streams	1	$\frac{1}{10} = 0.10$	$0.1 \times 27.8 = 3$		1					1	1	3
		Identify the sources and types of hazardous waste												
		Analyze the public and environmental impacts of hazardous waste												
		Measure the appropriate hazardous waste handling, treatment and disposal methods												
	Wastewater management and engineering (30%)	Describe different parameters to characterize wastewater	3	$\frac{3}{10} = 0.30$	$0.3 \times 27.8 = 8$	1	1	2				2	2	8
		Identify the different options of wastewater treatment												
		Illustrate the public health and environmental importance of wastewater management												

		Demonstrate laboratory analysis to characteristics wastewater in respect to the different parameters												
	Air pollution management (30%)	Describe the major categories and sources of air pollution	3	$\frac{3}{10} = 0.30$	$0.3 \times 27.8 = 8$	1	2	2	1			1	1	8
		Explain how air pollution affect human health, plants , animals and properties pollution												
		Understand how to collect air sample, analyze, and interpret the results												
		Compare the different approaches to air pollution control pollution												
	Total		10											
Environmental risk and impact assessment (16.7%)	Environmental and social impact assessment (33.3%)	Explain the concepts of environmental and social impact assessment	2	$\frac{2}{6} = 0.33\%$	$0.33 \times 16.7 = 6$	1	1	2				1	1	6
		Apply environmental and social impact assessment before and during different projects implementation												
		Evaluate proposed projects in terms of their negative consequences on environment and pollution												
		Generate mitigation measures for negative impacts of the major projects												
	Toxicology (33.3%)	Describe how dose-response curves are generated and the different types of dose-response relationships	2	$\frac{2}{6} = 0.33\%$	$0.33 \times 16.7 = 6$	1	2		1			2		6
		Describe the derivation of toxicological endpoints, including the LD50, LC50, ED50, NOAEL, and NOAEC												
		Differentiate acute and chronic toxicity and describe the organism factors that influence the magnitude of toxicity												
		Determine bio-concentration and bioaccumulation on organisms and its habitats												
	Health emergency and disaster risk management (33.4%)	Describe essential health interventions in different types of disasters	2	$\frac{2}{6} = 0.33\%$	$0.33 \times 16.7 = 6$		2		3	1				6
		Explain the role of environmental health in an emergency												
		Understand the policy, legal and												

		frameworks for Ethiopian public health preparedness													
		Plan for essential health interventions in different types of disasters													
		Plan for epidemiological surveillance in disasters situations													
		Demonstrate how environmental health infrastructure and practices are central to disaster management activities													
	Total		6												
Ecology and environmental pollution management (13.9%)	Environmental sampling and quality analysis (60%)	Describe the different environmental standards for water, wastewater, air and soil	3	$3/5 = 0.60$	$0.6 \times 13.9 = 8.34$			3	2					3	8
		Demonstrate on how to undertake sampling from different environmental compartments for environmental laboratory analysis													
		Perform physical, chemical, and biological analysis of water and wastewater using standard methods													
	Ecology (40%)	Identify major macroinvertebrates that have pollution indicator value for water quality control in water bodies, such as rivers	2	$2/5 = 0.40$	$0.4 \times 13.9 = 5.56$		2	3	1						6
		Describe hierarchy of ecological organization													
		Explain about ecological succession													
		Describe the impacts of human population on environment													
		Demonstrate how to conserve natural ecosystem													
	Total		5												
Residential and occupational health	Residential and institutional health (40%)	Discuss Basic principles of healthful housing	2	$2/5 = 0.40$	$0.4 \times 13.9 = 5.56$		1	2	1			1	1	6	
		Identifying the problems related to hygiene and sanitation													

(13.9%)		Discuss about Institutional health and Recreational health												
		Planning for the improvement of institutional hygiene and sanitation												
		Select the proper site for residential, commercial, industrial and recreational purposes												
		Develop Strategies for assessing and improving institutional hygiene												
		Apply proper preventive and corrective measures that contribute towards safeguarding health at family and institution levels												
	Occupational health and safety (60%)	Identify and characterize occupational hazards	3	$3/5 \times 100 = 60\%$	$0.6 \times 13.9 = 8$		3		3		1	1		8
		Measure and analyze the type of occupational hazards												
		Explain workplace Occupational hazard Anticipation, Recognition, Evaluation and control methods (OH)												
		Describe occupational hazards prevention and control methods												
		Carry out risk assessment												
	Total		5				X							
Environmental health law, policy and ethics (5.6%)	Environmental health professional ethics (50%)	Identify moral obligations and related problems in practical application of the profession	1	$1/2 = 0.50$	$0.5 \times 5.6 = 3$		1				2			3
		Distinguish between the roles that morals, ethics, and law have on public health												
		Propose professional ethical oath and codes for the Environmental Health Professional												
	Environmental health law and policy (50%)	Define law, environmental health law and policy, public health laws and other terms relevant to Environmental Health	1	$1/2 = 0.50$	$0.5 \times 5.6 = 3$		1						2	3
		Discuss the Ethiopian Environmental and public health laws and sectoral laws related to environmental health												
		Identify existing proclamations, rules and regulations relevant to the environmental health practitioner												

	Total		2											
Grand Total			36	100%										102

Table 5: Test blueprint Table (table of specification) for exit examination for BSc degree in Environmental Health.

Themes	Course Name	Credit hour	Share of the themes in %	General Objective/ Expected Competencies to be measured	Learning Outcome	Learning outcomes								Share of course in %
						Cognitive						Affective	Psychomotor	
						Remembering	Understanding	Application	Analysis	Evaluation	Creation/ Synthesis			
Water supply, health promotion	Water supply (25%)	2	22.2%	Determine water quality parameters and its public health importance and design drinking water safety	Explain the relationship between water and diseases Understand the different techniques of measurement of quality of water Perform laboratory analysis for the common biological water quality parameters Perform laboratory analysis for the common		1		1				4	6

otion and disea se contr ol				plan.	physical water quality parameters												
					Perform laboratory analysis for the common chemical water quality parameters												
					Identify drinking water surveillance parameters												
					Demonstrate the application of water quality guidelines and legislation in water quality management												
					Implement a practical water quality management principle in community water supply system												
	Medica l entomo logy and vector control (25%)	2	22. 2%	To explain different orders of Arthropod and vectors of medical importance, describe their public health problems, and Synthesize integrated vector and rodent prevention and control mechanisms.	Explain different orders of Arthropod vectors of medical importance		2	1	1	1				1		6	
					Explain the different disease transmission mechanism by arthropods												
					Conduct Arthropod surveillance and specimen identification using appropriate techniques and instruments												
					Describe the biology, ecology and vector capacity of medically important vectors												
					Describe the general control methods of Arthropod insect vector												
	Food safety and quality manag ement (50%)	4	22. 2%	Explain food safety and quality management techniques develop checklist for sanitary inspection, explain the heath impacts of GMO, and design food born disease management mechanisms.	Explain the status and challenges of food safety management in Ethiopia		3	4	1				1	2		11	
					Explain the characteristics of milk, egg, fish and meat related to their safety and quality												
					Develop sanitary inspection format												
					Compare the difference between ISO 2200 and HACCP												
					Differentiate the pros and cons of genetically modified foods												
					Determine the steps involved in the management of food borne diseases epidemic												
	Total	8															

Waste management (27.8 %)	Solid waste management (30%)	3	27.8	Explain integrated solid waste management systems and effectively implementation of hierarchies of solid water management	Calculate the solid waste generation rate and forecast total solid waste	2	2		2				2	8
					Quantify and characterize solid wastes and propose appropriate management system									
					Design a collection system using stationary container and hauled container systems, hauling route design and models, time components of a collection day and transfer stations									
					Explain factors affecting the composting process									
					Explain the concepts of resources recovery and waste to energy options in the management of solid wastes									
	Hazardous waste management (10%)	1	27.8	Explain the source and types of hazardous waste, its health impact and apply appropriate management options.	Define hazardous waste from waste streams		1						1	3
					Identify the sources and types of hazardous waste									
					Analyze the public and environmental impacts of hazardous waste									
					Measure the appropriate hazardous waste handling, treatment and disposal methods									
	Waste water management and engineering (30%)	3	27.8	To characterize wastewaters, identify its health impact, and design the appropriate treatment options.	Describe different parameters to characterize wastewater	1	1	2					2	8
					Identify the different options of wastewater treatment									
					Illustrate the public health and environmental importance of wastewater management									
					Demonstrate laboratory analysis to characteristics wastewater in respect to the different parameters									
	Air pollution management (30%)	3	27.8	To identify the sources and types of air pollutant, determine its environmental impact; perform air sampling and analysis to design possible	Describe the major categories and sources of air pollution	1	2	2	1				1	8
					Explain how air pollution affect human health, plants , animals and properties pollution									
					Understand how to collect air sample, analyze, and interpret the results									
					Compare the different approaches to air pollution control pollution									

				prevention and control options.												
	Total	10														
Environmental risk and impact assessment (16.7%)	Environmental and social impact assessment (33.3%)	2	11 6.7	To comprehend the concept of EIA and perform full EIA report before and during the implementation of the project to avoid/reduce its negative impacts on the environment	Explain the concepts of environmental and social impact assessment	1	1	2					1	1	6	
					Apply environmental and social impact assessment before and during different projects implementation											
					Evaluate proposed projects in terms of their negative consequences on environment and pollution											
					Generate mitigation measures for negative impacts of the major projects											
	Toxicology (33.3%)	2	16. 7	To explain toxic substances, differentiate acute and chronic effect of toxicants, and describe their fates on the environment (soil, air, water)	Describe how dose-response curves are generated and the different types of dose-response relationships	1	2		1				2		6	
					Describe the derivation of toxicological endpoints, including the LD50, LC50, ED50, NOAEL, and NOAEC											
					Differentiate acute and chronic toxicity and describe the organism factors that influence the magnitude of toxicity											
					Determine bio-concentration and bioaccumulation on organisms and its habitats											
	Health emergency and disaster risk management (33.4%)	2	16. 7	To apply appropriate disaster management mechanisms based on the national policy and legal frameworks, identify the role of environmental experts during pre, and post disaster situation.	Describe essential health interventions in different types of disasters		2		3	1					6	
					Explain the role of environmental health in an emergency											
					Understand the policy, legal and frameworks for Ethiopian public health preparedness											
					Plan for essential health interventions in different types of disasters											
					Plan for epidemiological surveillance in disasters situations											
					Demonstrate how environmental health infrastructure and practices are central to disaster management activities											

[illegible]

h (13.9%)				condition, implement institutional health standards (health facility, recreational areas, school, prison etc).	Select the proper site for residential, commercial, industrial and recreational purposes									
					Develop Strategies for assessing and improving institutional hygiene									
					Apply proper preventive and corrective measures that contribute towards safeguarding health at family and institution levels									
	Occupational health and safety (60%)	3	13.9	To determine occupational hazards and apply appropriate prevention and control strategies to create conducive working environment	Identify and characterize occupational hazards	3		3		1	1		8	
					Measure and analyze the type of occupational hazards									
					Explain workplace Occupational hazard Anticipation, Recognition, Evaluation and control methods									
					Describe occupational hazards prevention and control methods									
					Carry out risk assessment									
	Total	5												
Environmental health law, policy and ethics (5.6%)	Environmental health professional ethics (50%)	1	5.6	To describe the concepts of environmental health professional ethics and apply their professional oath	Identify moral obligations and related problems in practical application of the profession	1				2			3	
					Distinguish between the roles that morals, ethics, and law have on public health									
					Propose professional ethical oath and codes for the Environmental Health Professional									
	Environmental health law and policy (50%)	1	5.6	Differentiate law, environmental health law and policy, and public health laws and identify proclamations, rules, and regulations	Define law, environmental health law and policy, public health laws and other terms relevant to Environmental Health	1						2	3	
					Discuss the Ethiopian Environmental and public health laws and sectoral laws related to environmental health									
					Identify existing proclamations, rules and regulations relevant to the environmental health practitioner									

				relevant to the environmental health.												
	Total	2														
Grand Total		36														102

Note: The number of items assigned in the levels of domains is based on the nature of learning outcomes/objective

9. Learning outcomes in terms of the three domains (Cognitive, Affective and Psychomotor)

Table 6: Learning outcomes in terms of the three domains (Cognitive, Affective and Psychomotor) for exit examination for BSc degree in Environmental Health.

R.No.	Themes	Course Name	Cr Hours	Share of Courses (%)	Share of Competencies (in %)			Remark
					Knowledge	Skill	Attitude	
1	Water supply, health promotion and disease control	Water supply	2	25	2	4	0	
		Medical entomology and vector control	2	25	5	1	0	
		Food safety and quality management	4	50	8	2	1	
2	Waste management	Solid waste management	3	30	6	2	0	
		Hazardous waste management	1	10	1	1	1	
		Wastewater management and engineering	3	30	4	2	2	
		Air pollution management	3	30	6	1	1	
3	Environmental risk and impact assessment (16.7%)	Environmental and social impact assessment	2	33.3	4	1	1	
		Toxicology	2	33.3	4	2	0	
		Health emergency and disaster risk management	2	33.3	6	0	0	
4	Ecology and environmental pollution management (13.9%)	Environmental sampling and quality analysis	3	60	5	3	0	
		Ecology	2	40	6	0	0	
5	Residential and	Residential and institutional	2	40	4	1	1	

	occupational health (13.9%)	health						
		Occupational health and safety	3	60	7	0	1	
6	Environmental health law, policy and ethics (5.6%)	Environmental health professional ethics	1	50	3	0	0	
		Environmental health law and policy	1	50	1	2	0	
		Total (Aggregate)	36	100	72	22	8	

10. Conclusion

Exit examination can have a vital role in producing knowledgeable, skillful, and attitudinally matured graduates. The main idea behind an exit exam is the need to check whether students have attained the intended learning outcomes of the programs they have attended. In fact, exit exams can offer several potential benefits if designed as a reliable measure of student learning. It contributes to prepare competent graduates as it can serve as a quality check for effectiveness. It also helps in improving academic programs quality and effectiveness. Furthermore, it can create the platform for cooperation among academic programs at different universities to work jointly to improve the programs quality.

In light of this, this document is produced to assist the setting of the exit examinations for BSc degree in Environmental health program, which is being delivered by Ministry of Education starting from the coming June. To meet the graduation profile, competency, and learning outcome, exit exam competency selection and identifying core course was done. It will help you plan which questions to include in your exam and ensure that it adequately assesses the learning objectives of the course. A test blueprint is *great way to help construct effective exams for the courses*. As a result, preparing test blueprint is necessary to prepare distributed items based on the above criteria.

11. References

During the preparation of this test blue print, we have used the following two documents.

1. Nationally harmonized BSc degree in Environmental health curriculum, prepared and approved by the Ministry of Education, in 2021
2. Identified Competency Focus Areas and Selected Courses for National Exit Examination prepared for BSc degree in Environmental health