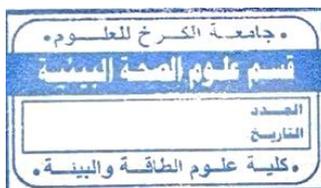


## Alkarkh university of sciences جامعة الكرخ للعلوم



*First Cycle – Bachelor's degree (B.Sc.) – Environmental Health Sciences*

بكالوريوس علوم - علوم الصحة البيئية



## Table of Contents

1. Overview
2. Undergraduate Modules 2023-2024
3. Contact

### 1. Overview

This catalogue is about the courses (modules) given by the program of environmental health science to gain the Bachelor of Science degree. The program delivers (50) Modules with (6000) total student workload hours and 240 total ECTS. The module delivery is based on the Bologna Process.

نظره عامه

يتناول هذا الدليل المواد الدراسية التي يقدمها برنامج علوم الصحة البيئية للحصول على درجة بكالوريوس العلوم. يقدم البرنامج (50) مادة دراسية، على سبيل المثال، مع (6000) إجمالي ساعات حمل الطالب و 240 إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

### 2. Undergraduate Courses 2024-2025

#### Module 1

Code	Course/Module Title	ECTS	Semester
KUS1101	Mathematics	5	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	77
Description			
the study of basic and advanced mathematical concepts. Mathematics courses deal with theoretical knowledge about number systems, data handling, algebra, geometry, trigonometry, etc.			

#### Module 2

Code	Course/Module Title	ECTS	Semester
KUS1102	Fundamental of Computer Science	3	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	11
Description			



the study of computers and computing, including their theoretical and algorithmic foundations, hardware and software, and their uses for processing information.

### Module 3

Code	Course/Module Title	ECTS	Semester
KUS1103	Democracy and Human Rights	2	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	-	33	17
Description			
تهدف المادة إلى بيان أهمية الحقوق الاصلية للصيقة بالانسان، التي تتفق مع فطرته، والتي يقبلها العقل المجرد، والتي لا تختلف باختلاف الزمان والمكان، وهذه هي حقوق الانسان.			

### Module 4

Code	Course/Module Title	ECTS	Semester
CRE1104	analytic chemistry	6	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	86
Description			
Study the principles of analytical chemistry and provides how these principles are applied in chemistry and related disciplines - especially in life sciences, environmental sciences and geochemistry.			

### Module 5

Code	Course/Module Title	ECTS	Semester
CRE1105	physics	7	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2/1	79	96
Description			
study of the natural world, covering the behavior of matter and energy. It explores the fundamental laws and principles that govern the universe, such as motion, energy, force, and gravity.			



**Module 6**

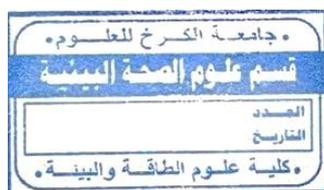
Code	Course/Module Title	ECTS	Semester
EHS1106	ecology	7	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2/1	79	96
Description			
Ecology courses offered through Coursera help learners gain knowledge on Ecology ecosystems and dynamics; how scientists study ecosystems; plant biology and biological research; what defines us as humans; the scientific, economic, and socio-political dimensions of ecosystems; and more.			

**Module 7**

Code	Course/Module Title	ECTS	Semester
EHS1207	human cytology	7	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2/1	79	96
Description			
This course explores the structure and function of human cells, emphasizing the cellular basis of life and the mechanisms that maintain cellular homeostasis. Students will learn about the cellular organization, cell cycle, signal transduction, and the relationship between cell dysfunction and diseases. The course includes lectures and laboratory work.			

**Module 8**

Code	Course/Module Title	ECTS	Semester
CRE1208	organic chemistry	6	2



Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	86
Description			
Description of the basics and principles of organic chemistry, the quality of chemical compounds, and the basis for their formation and composition.			

#### Module 9

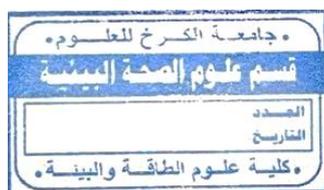
Code	Course/Module Title	ECTS	Semester
CRE1209	Geology	6	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	86
Description			
<i>When you study geology, you look at the processes that change Earth, like volcanic eruptions, landslides, earthquakes, and floods. You also examine the products that Earth's materials produce, such as metals, ores, and petroleum</i>			

#### Module 10

Code	Course/Module Title	ECTS	Semester
KUS12010	Arabic Language	2	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2		33	17
Description			
توظيف المفردات الفصيحة في الصياغة الاكاديمية للبحوث العلمية مترجمة بنظيرها الفصحى التمكّن من كتابة البحوث والمقالات ذات المحتوى العلمي الصرف باللغة العربية الفصحى			

#### Module 11

Code	Course/Module Title	ECTS	Semester
KUS12011	English language	2	2



Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2		33	17
<b>Description</b>			
Understand and use basic English vocabulary and expressions related to daily life, including greetings, introductions, and common objects.			

#### Module 12

Code	Course/Module Title	ECTS	Semester
EHS12012	environmental health principle	7	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2/1	79	96
<b>Description</b>			
<i>This course provides an overview of the key concepts, issues, and methods in environmental health. It focuses on understanding the interactions between the environment and human health, including the assessment and management of environmental risks. Students will explore various environmental hazards and their impacts on public health, as well as the role of environmental policies and practices in promoting health and sustainability.</i>			

#### Module 13

Code	Course/Module Title	ECTS	Semester
EHS23013	biostatistics	4	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2/1	79	21
<b>Description</b>			
Environmental Data Understanding: To equip students with an understanding of how to collect, analyze, and interpret environmental data using statistical methods.			

#### Module 14

Code	Course/Module Title	ECTS	Semester
ENV23014	microbiology	6	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)



2	2	64	86
<b>Description</b>			
<p><i>microbiology, study of microorganisms, or microbes, a diverse group of generally minute simple life-forms that include bacteria, archaea, algae, fungi, protozoa, and viruses. The field is concerned with the structure, function, and classification of such organisms and with ways of both exploiting and controlling their activities.</i></p>			

#### Module 15

Code	Course/Module Title	ECTS	Semester
EHS23015	environmental toxicology	6	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	86
<b>Description</b>			
<p>Provide students with a comprehensive understanding of the interdisciplinary nature of environmental toxicology, including its connections to ecology, chemistry, and public health</p>			

#### Module 16

Code	Course/Module Title	ECTS	Semester
KUS23016	Crimes of the baath regime in Iraq	2	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2		33	17
<b>Description</b>			

#### Module 17

Code	Course/Module Title	ECTS	Semester



EHS23017	biochemistry	6	3
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
2	2	64	86
<b>Description</b>			
<p><i>Biochemistry is a sub-discipline of Chemistry &amp; Biology. Biochemistry deals with the chemical processes within living organisms. Biochemistry courses are available as undergraduate, postgraduate &amp; doctoral programs in top universities.</i></p>			

### Module 18

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
EHS23018	community health	6	3
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
2	2/1	78	72
<b>Description</b>			
<p>This course provides an overview of the principles and practices of community health. It covers the social, economic, and environmental factors that affect the health of communities and explores strategies for promoting health and preventing disease at the community level. Students will learn about the role of community health professionals, community health needs assessment, program planning, and evaluation. The course includes lectures, case studies, and fieldwork to provide students with practical experience in community health.</p>			

### Module 19

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
CRE24019	climate change	4	4
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
2	1	48	52
<b>Description</b>			
<p>Climate is the general weather over a long period. This can include rainfall, temperature, snow or any other weather condition. We usually define a region's climate over a period of 30 years.</p>			



**Module 20**

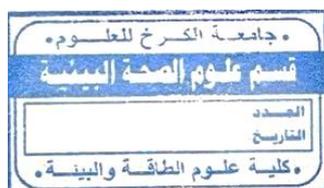
Code	Course/Module Title	ECTS	Semester
EHS24020	Arabic language 2	2	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2		33	17
Description			

**Module 21**

Code	Course/Module Title	ECTS	Semester
KUS24021	English language2	2	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2		33	17
Description			

**Module 22**

Code	Course/Module Title	ECTS	Semester
KUS24022	Computer science	3	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	11
Description			



**Module 23**

Code	Course/Module Title	ECTS	Semester
EHS24123	human physiology	5	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
Physiology is the study of how the human body works both when you're healthy and when you're not. When you're sick or injured, normal physiology is disrupted.			

**Module 24**

Code	Course/Module Title	ECTS	Semester
EHS24024	Environmental chemistry	5	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
<i>focuses on the presence and impact of chemicals in soil, surface water, and groundwater. Environmental chemists study how chemicals - usually contaminants - move through the environment. This is referred to as chemical "fate and transport". They also study the effects of these contaminants on ecosystems, animals, and human health</i>			

**Module 25**

Code	Course/Module Title	ECTS	Semester
EHS24025	Environmental pollution	4	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	52
Description			
In this lesson you will study about the major causes of pollution, their effects on our environment and the various measures that can be taken to control such pollutions			



**Module 26**

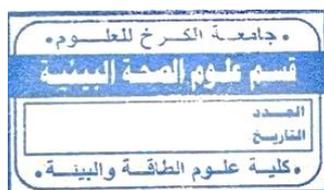
Code	Course/Module Title	ECTS	Semester
EHS24026	immunity	5	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2/1	79	46
Description			
this course focuses on how various immune system components are integrated during the response to infectious agents, and how the system is naturally or artificially perturbed in clinical conditions, such as immunodeficiency, autoimmunity, and cancer therapies			

**Module 27**

Code	Course/Module Title	ECTS	Semester
EHS35025	radiation and human health	4	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	52
Description			
This course explores the interactions between various types of radiation and human health. It covers the fundamentals of radiation physics, the biological effects of radiation exposure, radiation protection principles, and the use of radiation in medical applications. Students will learn about the risks and benefits associated with radiation exposure and the regulatory frameworks governing radiation safety.			

**Module 28**

Code	Course/Module Title	ECTS	Semester
EHS35028	Occupational Health and Safety	4	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	52



Description
the science of the anticipation, recognition, evaluation and control of hazards arising in or from the workplace that could impair the health and well-being of workers, taking into account the possible impact on the surrounding communities

#### Module 29

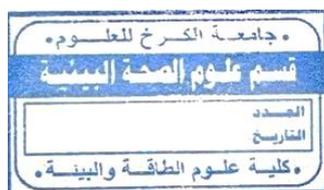
Code	Course/Module Title	ECTS	Semester
EHS35029	molecular biology	7	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	111
Description			
<p><i>Molecular biology is the study of proteins and nucleic acids and their role in the development, function, and replication of cells. Those cells may live within humans, animals, plants, or any other living organism. Molecular biologists work across a variety of disciplines, including vaccine development, biotechnology, and genetic modification. Their research and innovations can lead to medical breakthroughs in areas like disease prevention.</i></p>			

#### Module 30

Code	Course/Module Title	ECTS	Semester
EHS35030	environmental health legislations	4	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	77
Description			
<p>This course provides an overview of the laws and regulations that govern environmental health. It explores the historical development of environmental health legislation, the roles of governmental and non-governmental organizations, and the impact of legal frameworks on public health and the environment. Students will analyze key environmental health laws, examine case studies, and explore the challenges and opportunities in implementing and enforcing these laws.</p>			

#### Module 31

Code	Course/Module Title	ECTS	Semester
EHS35031	pathology	5	5



Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	77
<b>Description</b>			
The four aspects of a disease process that form the core of pathology are (1) its cause (etiology), (2) the mechanisms of its development (pathogenesis), (3) the structural alterations induced in the cells and organs of the body (morphologic changes), and (4) the functional consequences of the morphologic changes			

### Module 32

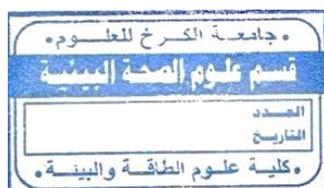
Code	Course/Module Title	ECTS	Semester
EHS35032	environmental analysis	6	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	86
<b>Description</b>			
<i>This course introduces the principles and methodologies used in the analysis of environmental samples. Students will learn about different types of environmental pollutants, sampling techniques, analytical methods, and data interpretation. The course includes both theoretical and practical components, with hands-on laboratory sessions and fieldwork to provide students with real-world experience in environmental analysis.</i>			

### Module 33

Code	Course/Module Title	ECTS	Semester
EHS36033	biodiversity	5	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	77
<b>Description</b>			
<i>Biodiversity and Conservation explores natural landscapes, species and ecosystems and offers theories and practical methods to preserve environments and organisms. Biodiversity refers not only to endangered species but also to every organism, including microbes and fungi.</i>			

### Module 34

Code	Course/Module Title	ECTS	Semester
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EHS36034	Air Quality and Purification	6	6
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
2	2	64	86
<b>Description</b>			
<p>This course explores the science of air quality, including the sources and types of air pollutants, their health and environmental impacts, and the technologies and strategies used to purify air. Students will learn about the regulatory standards for air quality, methods for monitoring and measuring air pollution, and the design and implementation of air purification systems. The course includes lectures, laboratory exercises, and field visits to provide students with practical experience in air quality management and purification.</p>			

#### Module 35

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
EHS36035	Food Safety	6	6
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
2	2	64	86
<b>Description</b>			
<p><i>Food safety is a management system that is applied by a food business to ensure that potential hazards are controlled to acceptable levels. Food safety concerns all types of hazards and includes the system of corrective actions, monitoring, and how to achieve safe</i></p>			

#### Module 36

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
EHS36036	Environmental Health Genetics	6	6
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
2	2	64	86
<b>Description</b>			
<p>Environmental factors, as related to genetics, refers to exposures to substances (such as pesticides or industrial waste) where we live or work, behaviors (such as smoking or poor diet) that can increase an individual's risk of disease or stressful situations.</p>			



**Module 37**

Code	Course/Module Title	ECTS	Semester
EHS36037	epidemiology	4	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	52
Description			
<p><i>The field of epidemiology, including its history and contribution to public health, is highly essential in a variety of undergraduate and graduate degree programs. Subjects of epidemiology are required in public health, environmental health, nursing, health research, and other health-related disciplines.</i></p>			

**Module 38**

Code	Course/Module Title	ECTS	Semester
EHS36038	elective1	3	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2		33	42
Description			
<p>كيمياء خضراء , سيطرة على نواقل الامراض, علم التقانات النانوية</p>			

**Module 39**

Code	Course/Module Title	ECTS	Semester
EHS47039	scientific research methods	2	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2		33	17
Description			



*This course focuses on research methodologies. the focus will be placed on qualitative and quantitative research methodologies, sampling approaches, and primary and secondary data collection. The course begins with a discussion on qualitative research approaches, looking at focus groups, personal interviews, ethnography, case studies and action research.*

#### Module 40

Code	Course/Module Title	ECTS	Semester
EHS47040	environmental impact assessment	6	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	87
Description			
<i>Environmental Impact Assessment (EIA) is a process of evaluating the likely environmental impacts of a proposed project or development, taking into account inter-related socio-economic, cultural and human-health impacts, both beneficial and adverse.</i>			

#### Module 41

Code	Course/Module Title	ECTS	Semester
EHS47041	Virology	6	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	86
Description			
<i>virology is the study of viruses and virus-like agents, including, but not limited to, their taxonomy, disease-producing properties, cultivation, and genetics.</i>			

#### Module 42

Code	Course/Module Title	ECTS	Semester
EHS47042	solid and hazardous waste management	6	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	87



Description
<i>The education needed to be a waste management specialist is normally a bachelor's degree. Waste management specialists usually study environmental science, business or biology. 61% of waste management specialists hold a bachelor's degree.</i>

#### Module 43

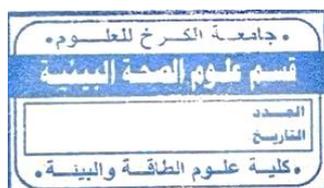
Code	Course/Module Title	ECTS	Semester
EHS47043	elective 2	5	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1/1	63	62
Description			
			اسعافات أولية طفيليات افات ومبيدات

#### Module 44

Code	Course/Module Title	ECTS	Semester
EHS47044	Bioremediation	5	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	62
Description			
<i>it is simply a sustainable method for cleaning up contaminated soil or water by enhancing natural biological processes to occur. Microorganisms/plants are able to break-down many types of contamination (e.g. fuels, oil, explosives, pesticides...) by a clean, efficient &amp; relatively inexpensive biological process.</i>			

#### Module 45

Code	Course/Module Title	ECTS	Semester
EHS48045	graduation project	6	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)



	4/1/1	92	58
<b>Description</b>			

#### Module 46

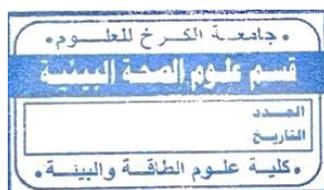
Code	Course/Module Title	ECTS	Semester
EHS48046	water and waste water treatment	6	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	86
<b>Description</b>			
<p>The major aim of wastewater treatment is to remove as much of the suspended solids as possible before the remaining water, called effluent, is discharged back to the environment. As solid material decays, it uses up oxygen, which is needed by the plants and animals</p>			

#### Module 47

Code	Course/Module Title	ECTS	Semester
EHS48047	transmission diseases	5	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	77
<b>Description</b>			
<p>contact transmission includes direct contact or indirect contact. Person-to-person transmission is a form of direct contact transmission.</p>			

#### Module 48

Code	Course/Module Title	ECTS	Semester



EHS48048	Quality control	5	8
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
2	1	48	77
<b>Description</b>			
Quality control is the process by which services/products are measured and tested to ensure they are as uniform as possible and meet a standard. It helps businesses minimize inconsistencies and improve product quality			

#### Module 49

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
EHS48049	Serology and vaccines	4	8
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
2	1	48	52
<b>Description</b>			
Vaccines are complex biologic products designed to induce a protective immune response effectively and safely.			

#### Module 50

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
EHS48050	elective 3	4	8
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
2	1	48	52
<b>Description</b>			
مراقبة وتفتيش بيئي , تدوير نفايات			

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