



**West African Health Organisation (WAHO)**  
**Organisation Ouest Africaine de la Santé (OOAS)**  
**Organização Oeste Africana da Saúde (OOAS)**



## **HARMONIZED UNDERGRADUATE CURRICULUM FOR THE TRAINING OF ENVIRONMENTAL HEALTH PROFESSIONALS IN ECOWAS REGION**

**CURRICULUM HARMONISE POUR LA FORMATION DES CADRES  
DE LA SANTE ENVIRONNEMENTALE DE L'ESPACE CEDEAO**

**CURRICULUM HARMONIZADO DE FORMAÇÃO DOS QUADROS  
EM SAÚDE AMBIENTAL DO ESPAÇO CEDEAO**

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## **ABBREVIATIONS**

WAHO	West Africa Health Organization
EHIA	Environmental Health Impact Assessment
BSc	Bachelor of Science
BEHS	Bachelor of Environmental Health Science
WASH	Water Sanitation and Hygiene
GCE	General Certificate in Education
RAM	Random Access Memory
ROM	Read Only Memory
CLTS	Community Led Total Sanitation
IEC	Information, Education and Communication
MDG	Millennium Development Goals
WSSD	World Summit on Sustainable Development
NEPAD	New Partnership for Africa Development
GIS	Geographical Information System
EIA	Environmental Impact Assessment
SPSS	Statistical Product and Service Solution
HIV	Human Immuno- deficiency Virus
PHC	Primary Health Care
SWOT	Strengths, Weaknesses, Opportunities and Threats
EHIS	Environmental Health Information System
AFP	Alpha-Feto Protein
CVS	Chorionic Villus Sampling
PUBS	Percutaneous Umbilical Blood Sampling
NST	Non-Stress Test
MRI	Magnetic Resonance Imaging
IDRS	Integrated Disease Surveillance and Response

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## **FOREWORD FROM WAHO DIRECTOR GENERAL**

The West African Health Organisation (WAHO) is the Specialized Health Institution of the Economic Community of West African States (ECOWAS) with the sole responsibility to provide leadership in all health care matters in the region.

The mission of the West African Health Organisation is the attainment of the highest possible standard and protection of health of the peoples in the sub-region through the harmonization of the policies of Member States, pooling of resources, cooperation with one another and with others for a collective and strategic combat against the health problems of the sub-region.



To facilitate education of health professionals that is responsive to essential health problems, as well as availability and mobility of Human Resources for Health in the ECOWAS sub region, the following resolutions and protocols were put in place by the Heads of States and Governments of ECOWAS to promote the rationale and basis for curriculum harmonization and to ensure its implementation:

1. ECOWAS Protocol A/P3/1/03/Dakar Convention 2003 A/C.1/1/03 on recognition of equivalence of diplomas, certificates and other qualifications in ECOWAS Educational Institutions.
2. Adoption of a Resolution on Harmonization of Curricula in ECOWAS by the 7th Assembly of Health Ministers (AHM) in July 2006 (Abuja)
3. Adoption of a Resolution on Motivation and Retention of Human Resources for Health HRH by Assembly of ECOWAS Health Ministers in 2009 at Yamoussoukro, Cote D'Ivoire.
4. The 2009-2013 second strategic and operational plan of WAHO required that a competence based curriculum should be developed/harmonized for the training of the different categories of Health Professionals in ECOWAS region.

Consequent upon the foregoing the harmonization facilitated by WAHO in the region includes the training and practice of all health professions including Environmental Health Profession which is categorized under the Allied Health Professions. The efforts of every health professional, the academia and others who have contributed in one way or the other to ensuring the successful execution of this laudable objective are well commended.

It is therefore our belief that this document will serve as a veritable tool for universities and training institutions and serve as a platform to enhance the mobility of our health professionals across countries in the ECOWAS region, thus promoting the delivery of effective preventive and curative health care services to the ECOWAS people by well skilled personnel. It will also enable us fast track the achievement of the health related Millennium Development Goals by the target year of 2015 and beyond.

**Dr Xavier CRESPIN**  
**Directeur Général**



## **PREAMBLE**

Environmental Health has variously been defined as the control of all factors in man's physical environment which exercise, or may exercise, a deleterious effect on his physical development, *health or survival* or as comprising of those aspects of human health, including quality of life, which is determined by physical, biological, chemical, social and psychological factors in the environment. It refers to the theory and practice of assessing, correcting, controlling, and preventing these factors that can potentially affect adversely the health of present and future generations.

Environmental health services are organized community efforts to monitor and modify man-environment-relationships in the interest of better health.

The components of Environmental Health are: Waste management; food hygiene and control; pest and vector control; environmental health control of housing and sanitation; epidemiological investigation and disease control; air quality management; occupational health and safety; water resources management and sanitation; noise control; protection of recreational environment; radiation control and health; health control of frontiers, air and sea ports and border crossing; pollution control and abatement; educational activities (health promotion and education); promotion and enforcement of environmental health quality standards; collaborative efforts to study the effects of environmental hazards (research); environmental health impact assessment (EHIA) and the management of emergency situations, disasters, flooding, disease outbreaks, etc.

The rapid development that is being witnessed in West Africa in the last two decades is, without doubt, having a great impact on the environment with its attendant health hazards. This has worsened the age-long sanitary problems that have been with us.

Currently, the rapid technological advances accompanied by industrialisation, urbanisation and mechanised farming are creating new hazards and these continue to magnify existing problems which in turn threaten the social, physical and mental well-being of the population in West Africa. As such, the need to re-invigorate environmental health manpower development becomes more apparent so as to be able to cope with emerging challenges. The existing diploma programme in the Public Health Training institutions across ECOWAS region is facing stronger challenges which can only be met with higher levels of training and skills.

## **PHILOSOPHY**

The Environmental Health programme offers a broad, multidisciplinary approach to issues and challenges in the field. Students learn sources of contamination of environmental media i.e. air, water, soil and food; routes of transmission; strategies to prevent or control adverse effects on human health or environmental quality; and effective communication of information to both the public and to health professionals. Additional skills will be developed through participation in supervised research and mentoring into public health issues related to physical, chemical, and biological pollution/contamination of the environment and the toxicological effects with appropriate solution to mitigate negative impacts.

## **JUSTIFICATION FOR THE PROGRAMME**

A reciprocal relationship exists between man and his total environment. The aim or goal of Environmental Health is to achieve a healthy environment that sustains optimal human health. To achieve this, there is a need for the training or re-training of manpower to take up the challenges of environmental decay or degradation due to anthropogenic activities and other natural causes. This is because there is growing concern that environmental pollution or contamination and degradation at the local, regional and global levels has increased the demand for a reliable information database on the impact of such pollution on the environment. Every year, in spite of all advancement in medical, health and biomedical sciences, millions of people still get ill with reduced life expectancy from exposure to environmental health hazards. Proper environmental monitoring and control as rendered by trained Environmental Officer is therefore important. This Curriculum is aimed at producing such qualified EHOs across the ECOWAS region.

### **Overall Objectives**

The overall objective of the Bachelor of Environmental Health Science (BEHS) Degree Programme is to contribute towards the improvement of the health of the ECOWAS population and its quality of life. It is therefore expected that at the end of the course, an environmental health graduate should have acquired knowledge, skills and attitudes to function effectively. At the end of the training graduates should be able to exhibit competencies in the following domains:

#### **a. Cognitive**

1. Describe the scientific principles involved in the identification and analysis of, providing solution to Environmental health problems.
2. Identify the communication and group dynamic processes necessary to effect changes.
3. Describe the investigative or monitoring processes necessary to identify the environmental health problems in a community.
4. Describe in detail the steps in planning and implementing an appropriate environmental health programme aimed at solving those problems.
5. Describe the basic knowledge of physical, sociological and biological theories, concepts and principles and application of these in the practice of environmental health.
6. Describe in detail the list of the commonest communicable diseases in the country, their mode of transmission and indicate methods of controlling the biological and physical environment so as to prevent them.
7. Explain the Environmental Health Laws of their country and their rational application so as to encourage citizens on voluntary compliance.

#### **b. Psychomotor**

8. design a satisfactory graphic representation of water treatment plant
9. design a satisfactory graphic representation of the sewage disposal and treatment plant
10. design and supervise construction of basic sanitary facilities
11. prepare and supervise application of appropriate insecticides formulations using suitable spraying equipment

#### **c. Affective**

1. Demonstrate an attitude that places premium on team work, accepting and performing leadership and followership role with equal effectiveness.

2. Demonstrate an attitude of self confidence in the contribution of his profession to the health of the nation and hence continually seek self-education and improved effectiveness.
3. Demonstrate an attitude of scientific enquiry in relation to every aspect of his professional activity, never taking anything for granted nor prematurely jumping to conclusions.
4. maintain harmonious inter- and intra-cadres relationship with co-professionals and members of the public

### **EMPLOYMENT OPPORTUNITIES**

A career in Environmental health is both rewarding and challenging. Thus graduates of the discipline will be very suitably equipped to take on gainful employment in the following areas.

- Ministries of Environment ( Federal and States)
- Ministries of Health (Federal and States)
- Ministries of Culture and Tourism ( Federal and States)
- Ministries Agriculture, and Rural Development (Federal and States)
- Ministries of Water Resources (Federal and States)
- Port Health Authority
- Local Government/ Rural Development Authority
- Tertiary/Secondary health Institutions
- Educational institutions
- Oil and Gas Industries.
- Petro Chemical Industries
- Private Sector (Environmental Health Service Providers companies)
- Food Processing Industries
- Mining Industries.
- NGOs in Water, Sanitation And Hygiene (WASH)
- Hospitality Industries such as Hotels,
- Military and Paramilitary services
- Public Health related Agencies and Environmental Sanitation Boards.
- Pollution Monitoring and control outfits. Research Institutions.
- Public Health department of Ministries of Health, Public utilities etc.
- Agencies concerned with food inspection, standards, disease control and immunization programmes etc..
- Public and Private Establishments and independently operated laboratories/and referral units for the analysis of environmental samples such as water board, restaurants, hotels, banks, recreational facilities confectionaries/bakery etc.
- Establish private outfits in different areas of Environmental Health management, eg disease prevention unit

## **ADMISSION REQUIREMENTS**

Two modes of entry (Preliminary and Direct) will be available to candidates intending to study the Bachelor of Environmental Health Science Degree in any University across the ECOWAS region:

1. Candidates intending to enter the BEHS programme at the preliminary level ( **1<sup>st</sup> year**) must satisfy individual university's admission requirements and holds the ordinary level examination results (conducted by the West African Examinations Council or other national recognized examining bodies) for Anglophone countries or its Francophone countries, advance level (BAC) or its equivalent with 5 credit passes in English, Mathematics, Biology/Health Science, Chemistry and Physics (in not more than two sittings).

2. A direct entry candidates may be admitted into levels 200 or 300 of the programme provided the candidate has the following qualifications:

- i. For 200 level admission candidate must hold either:
  - a) Advanced level GCE or its equivalence in relevant science subjects.
  - b) Holders of first degree from recognised institutions in non-biological courses such as Building Technology and Town Planning, Meteorology or Geology and any other relevant courses and licensed by appropriate regulatory body.
- ii. For 300 level admission candidate should hold any of the following:
  - (a) University first degree from recognized institutions, in related disciplines such as Health Science, Medical Laboratory Science, Biological Science, Microbiology, Entomology, Health Education and Promotion, Veterinary Science, Food Science and Technology, Human Nutrition, or other relevant courses.
  - (b) HND in Environmental Health with the basic ordinary level requirements. However the holder of HND should have satisfied other minimum university requirements and be licensed by relevant regulatory bodies with a minimum of one post qualification experience.
- iii. Holders of professional Diploma in Environmental Health with 5 credit passes in WASCE, GCE, SSCE, or other recognised National Examinations as stated in 1 above and registered by relevant professional body may be admitted into 200 level of the programme after acquiring three years post qualification experience.

## **Nomenclature for the Degree programme**

The degree programme shall be designated Bachelor of Environmental Health Science (BEHS).

## **Domicile Faculty/ Department to run the Programme**

The programme may be based in a health science or science related faculty or institute of a recognised University. Any university intending to run the programme is expected to establish a separate department to run the programme.

## **Duration of the Programme**

The programme is designed to run for **10 Semesters or five academic sessions**. However the number of semester spent will depend on the point of entry. Other requirements shall be as specified by the host University.



## **Qualification for Trainers**

Qualification and status of trainers shall include:

- a. Masters degree with appropriate professional qualifications
- b. Doctorate degree with appropriate professional qualifications
- c. Other recognized technical and professional qualifications

## **DEGREE STRUCTURE**

The **first year** of the programme introduces students to the basic scientific concepts upon which environmental health is based. This level is essentially a faculty of science-based programme as obtained in similar health sciences and science based degree programmes. Courses of instruction would include among others; Chemistry, Biology, Mathematics, Physics, Communication and Laboratory Skills.

In the **second year**, students are introduced to the Biological sciences, microbiology and bacteriology, food and nutrition science, and environmental planning and construction. Specific environmental health/health sciences are introduced at this level. The courses at this level should incorporate classroom teaching, laboratory practicals and field trips.

In the **third year**, some core Environmental health subjects are introduced as well as basic epidemiology and biochemistry. Transferable skills in research methods, entrepreneurship, data analysis and interpretation; and problem solving are developed.

The **fourth year** shall comprise core environmental health subjects and professional exposure, the latter being field experience based. Students during their industrial attachment shall be required to undergo supervised field experience in different Environmental Health settings in order to provide appropriate exposure to the practice of components of environmental health. This field experience shall include but not limited to rural and urban sanitation, industrial sanitation, occupational health programme, disease/vector control, environmental health administration and practice etc.

The **final year** of the programme builds on the experience gained above and introduces contemporary issues in the practice and application of Environmental Health. Students shall undertake a research project to be examined by an external examiner preferably Environmental Health professional.

At the end of the programme, the appropriate regulatory body in each country shall induct and admit the candidates into the profession.

## **PRACTICE AREA (Environmental Health Service Village)**

Each institution shall annually identify and maintain an Environmental Health Service practice area/village in its proximity. The practice area which shall serve as environmental health skills development centre is expected to have facilities for waste management, water sanitation, food/meat hygiene, etc.

## **PRACTICAL FIELD PLACEMENT**

Each student shall be placed on one year field internship after qualification under a qualified Environmental Health Professional with at least 10 years cognate experience.

### **COURSE CODES:**

For uniformity, courses are broadly classified into Core Environmental Health courses and others. The core Environmental Health Courses must be offered as described by this minimum standard in the Department of Environmental Health, while the others may be offered in other Departments and faculties where such or similar courses exist. The core Environmental Health courses must retain the EHS (Environmental Health Science) code, while the others may retain the code or carry another code of a similar course offered in another department or faculty.

### **REGISTRATION OF STUDENTS WITH THE REGULATORY BODIES**

The department running the BEHS programme is expected to register the students **within the first year** of admission with the countries' regulatory body. ***This is for the purpose of indexing.*** The registration is recognized as the effective date of commencement of the course and it also determines when the student is due for the first and final Council Professional Examinations, bearing in mind that the student must have fulfilled the University requirements to proceed to 400 levels.

### **REGISTRATION WITH THE REGULATORY BODIES ENTAILS:-**

- (i) Completion of a Student Registration Enrolment Form which must be endorsed by the Head of Department who should be registered with the regulatory body.
- (ii) Payment of prescribed fees
- (iii) Presentation and screening of credential for eligibility
- (iv) Eligible students are then enrolled as Environmental Health student with student registration number
- (v) Students enrolment letters are sent through the Head of Department
- (vi) Students who fail the eligibility screening would be advised to withdraw from the programme forthwith until the requirements are met for the programme.

### **Grading**

SN	Percentage Score	Letter Grade	Grade Point
1	75% - 100%	A	3.5 - 4.0
2	70% - 74%	B	3.0 - 3.49
3	60% - 69%	C	2.5 - 2.99
4	50% - 59%	D	2.0 - 2.49
5	Less than 50%	E	< 2.0

### **Classification of Degree**

GPA	Class of Diploma
3.5 – 4.0	Distinction
3.0 – 3.49	Upper Credit
2.5– 2.99	Lower Credit
2.0 – 2.49	Pass
0.00-1.99	Fail

## COURSE OUTLINES

### YEAR ONE

Science based/university 1<sup>st</sup> year courses as applicable to individual universities in different countries may be added to the **basic minimum course requirements** indicated below.

Please note that the number of hours is for the whole semester and the hours of the theory and practical is per week. Also, **where any of these courses already exists in the university curriculum, they could be run as specified by the host university.**

### YEAR ONE - FIRST SEMESTER

Course Code	Course Title	Hours	Theory	Practical	Status	Units
GST 111	Logic and Creative Thinking	15	2	0	C	2
GST 112	Use of Library	30	2	0	C	2
GST 113	English/Communication Skills I	30	2	0	C	2
BIO 101	General Biology I	45	3	0	C	3
PHY 101	General Physics I	45	3	0	C	3
CHM 101	General Chemistry I	45	3	0	C	3
GST 114	Introduction to ICT	30	2	0	C	2
MTH 101	General Mathematics	30	2	0	C	2
GST 115	Introductory Cytology & Genetics	30	2	0	C	2
FRE 101	Functional French I	30	2	0	C	2
<b>Total</b>		<b>330</b>	<b>23</b>			<b>23</b>

### YEAR ONE – SECOND SEMESTER

Course Code	Course Title	Hours	Theory	Practical	Status	Units
BOT 112	Introductory Botany	15	2	0	C	2
BIO 102	General Biology II	45	1	2	C	3
PHY 102	General Physics II	45	1	2	C	3
CHM 102	General Chemistry II	45	0	3	C	3
EHS120	Environmental Health & African Culture	30	2	0	C	2
GST 121	Citizenship Education	30	2	0	C	2
GST 122	Introduction to ICT II	30	2	0	C	2
TDS 102	Technical Drawing Skills I	45	1	2	C	3
GST 123	English/Communication Skills II	30	2	0	C	2
FRE 102	Functional French II	30	2	0	C	2
<b>Total</b>		<b>345</b>	<b>15</b>	<b>7</b>		<b>24</b>

**YEAR TWO – FIRST SEMESTER**

Course Code	Course Title	Hours	Theory	Practical	Status	Units
CSC 201	Computer Applications	30	1	1	C	2
ANAT 201	Human Anatomy	30	2	1	C	3
MCB 201	General Microbiology	30	1	1	C	2
BCH 201	General Biochemistry	30	1	1	R	2
PGY 201	Human Physiology	30	2	1	C	3
EHS 201	Ecology & Env. Studies	30	1	1	C	2
EHS 203	Introduction to Environmental Health	30	1	1	C	2
EHS 205	Hygiene Education & Health Promotion	30	2	0	C	2
TDS 201	Technical Drawing Skills II	45	1	2	C	3
EHS 207	Climate Change & Contemporary Issues	30	2	0	C	2
<b>Total</b>		<b>300</b>	<b>12</b>	<b>9</b>		<b>21</b>

**YEAR TWO – SECOND SEMESTER**

Course Code	Course Title	Hours	Theory	Practical	Status	Units
EHS 202	Fundamentals of Epidemiology	30	3	0	C	3
EHS204	Introduction to Environmental Health Services and Practice	30	1	1	C	2
CHM 206	Introduction to Organic Chemistry	30	1	1	R	2
EHS 208	Immunology and Immunization	30	1	1	C	2
EHS 210	Health Psychology & Sociology	30	2	0	C	2
EHS 212	Environmental Pollution and Control	30	2	1	C	3
EHS 214	Basic and Biostatistics	30	2	0	C	2
EHS 216	Urban Planning & Sustainable Development	30	1	1	C	2
EHS 218	Human Nutrition & Dietetics	30	1	1	C	2
<b>Total</b>		<b>270</b>	<b>14</b>	<b>6</b>		<b>20</b>

**YEAR THREE – FIRST SEMESTER**

Course Code	Course Title	Hours	Theory	Practical	Status	Units
EHS 301	General Pathology	45	2	1	R	3
EHS 303	General Parasitology	30	2	1	R	3
EHS 305	Biomedical & Health Care Wastes	45	2	1	C	3
EHS 307	General Entomology	45	2	1	C	3
EHS 309	Primary Health Care	15	1	1	C	2
PHM 311	Basic Pharmacology	30	2	0	C	2
EHS 313	Environmental Management	30	2	0	C	2
EHS 315	Public Health Management of Pesticides/Chemicals	30	2	1	C	3
EHS 317	Environmental Health Information Systems	30	1	1	C	2
EHS 319	Health Safety and Environment	15	2	0	C	2
<b>Total</b>		<b>315</b>	<b>18</b>	<b>7</b>		<b>25</b>

**YEAR THREE – SECOND SEMESTER**

Course Code	Course Title	Hours	Theory	Practical	Status	Units
EHS 302	Health Economics	30	2	0	C	2
EHS 304	Food Hygiene and Safety	30	1	1	C	2
EHS 306	Sanitation Technology	30	1	1	C	2
EHS 308	Sanitary Inspection of Premises	30	1	1	C	2
EHS 310	Environmental Biotechnology	30	1	1	C	2
EHS 312	Control of Communicable & Non-Communicable Diseases	30	1	1	C	2
EHS 314	Principles of Housing/Building Construction	30	1	2	C	3
EHS 316	Environmental Health Services in Emergency Situations	30	2	0	C	2
EHS 318	Introduction to Demography	30	2	0	R	2
EHS 320	Water Resources Management	30	2	0	C	2
EHS 322	Reproductive Health	30	2	0	R	2
EHS 324	Biometeorology	30	1	1	C	2
<b>Total</b>		<b>360</b>	<b>17</b>	<b>8</b>		<b>25</b>

**Elective Courses (1 unit each)**

**YEAR FOUR– FIRST SEMESTER**

Course Code	Course Title	Hours	Theory	Practical	Status	Units
EHS 401	Environmental Toxicology	30	1	1	C	2
EHS 403	Environmental Health Lab I	30	1	1	C	2
EHS 405	Environmental Health Administration	30	2	0	C	2
EHS 407	Entrepreneurialship in EH	30	2	0	C	2
EHS 409	Research Methodology & Proposal Writing	30	2	0	C	2
EHS 411	Sanitary Engineering	30	1	1	C	2
EHS 413	Environmental Health Practice I	30	2	0	C	2
EHS 419	Meat Inspection and Abattoir/ Slaughter slab Management	30	1	1	C	2
EHS 421	Public Utilities & Env. Health	30	2	0	R	2
<b>Total</b>		<b>270</b>	<b>14</b>	<b>4</b>		<b>18</b>

**Elective Courses (1 unit each)**

EHS 415 Environmental Health Planning

EHS 417 Child Survival and Development

**YEAR FOUR– SECOND SEMESTER**

Course Code	Course Title	Hours	Theory	Practical	Units
EHS 402	Industrial Attachment			C	6
<b>Total</b>					<b>6</b>

The Second Semester of the **4<sup>th</sup> Year** should be used for Industrial Attachment for the students in order to expose them to Environmental Health facilities in rural and urban settings. They are required to visit Environmental Health firms, industries and laboratories to enable them acquire the skills in Environmental Health Sciences. Each student must keep and present log book for assessment at the end of his/her industrial attachment. Log book shall carry not less than 25% of overall industrial attachment score.

Regulatory bodies in each ECOWAS state should collaborate with training institutions in IT placement and supervision.

**Note:****C: Compulsory Courses****R: Required Courses**

### YEAR FIVE – FIRST SEMESTER

Course Code	Course Title	Hours	Theory	Practical	Status	Units
EHS 501	Research Project I		0	2	C	2
EHS 503	Seminar	30	1	1	C	2
EHS 505	Environmental Health Ethics	15	2	0	C	2
EHS 507	Environmental Epidemiology	30	1	1	C	2
EHS 509	Environmental Health Lab II	30	1	1	C	2
EHS 511	Environmental Health Regulations, Policies and Laws	45	2	1	C	3
EHS 513	EIA/Health Impact Assessment	45	2	1	C	2
EHS 515	Environmental Health Physics	30	1	1	C	2
EHS 517	Environmental Health Practice II	30	2	0	C	2
EHS 519	Emergency Medical care	30	1	1	C	2
<b>Total</b>		<b>285</b>	<b>13</b>	<b>9</b>		<b>21</b>

**Elective Course (1 unit)**

### YEAR FIVE – SECOND SEMESTER

Course Code	Course Title	Hours	Theory	Practical	Status	
EHS 502	Research Project II	60	0	4	C	4
EHS 504	Occupational Health & Safety	45	2	1	C	3
EHS 506	Solid Waste Management	30	1	1	C	2
EHS 508	Community Health Services	30	1	1	C	2

Students **shall** choose any **one from each of the following groups** in addition to the above:

Group 1

EHS 510	International Health/Port Health Services	30	1	1		2
EHS 512	Disease Surveillance and Notification	30	1	1		2

Group 2

EHS 514	Sewage Management	30	1	1		2
EHS 516	Waste Water Management	30	1	1		2

Group 3

EHS 518	Air Quality Management	30	1	1		2
EHS 520	Water Quality Management	30	1	1		2
<b>Total</b>		<b>255</b>	<b>7</b>	<b>10</b>		<b>17</b>

**Elective Courses (2 unit each)**

### **OVERALL SUMMARY**

<b>YEAR</b>	<b>Hours</b>	<b>Theory</b>	<b>Practical</b>	<b>Credit Units</b>
YEAR 1	775	40	7	47
YEAR 2	570	26	15	41
YEAR 3	675	35	15	50
YEAR 4	270	14	10	24
YEAR 5	335	20	18	38
<b>Total</b>	<b>2825</b>	<b>135</b>	<b>65</b>	<b>200</b>

### **COURSE DESCRIPTION**

#### **GST 111: Logic and Creative Thinking (2 Credit Units)**

Introduction to philosophy and logic, Definition of logic, Types of logic, Identification between logic and argument, Difference between rhetoric, explanation, description etc, Tools in logic and their merits, Formal proof, truth table; laws of thought, methods of deduction using rules of inference, inductive reasoning and bi-conditional, introduction to qualification theory.

#### **GST 112: Use of Library (2 Credit Units)**

The basic concepts of librarianship, types of library and forms of library services, cataloging and classification systems and the use of the library in research. Qualities of a good library, the essential elements of a good library, library ethics and e-library etc.

#### **GST 113: English and Communication Skills (2 Credit Units)**

Skills of listening, comprehending, report writing, retrieval of information from communication media for interpretation and evaluation, effective reading skills, comprehending at varying speed levels, reading for vocabulary development in various academic contents, writing of essay and speeches, answers and other assignments, instructions on lexis and structure, collection and organization of materials and logical presentation for written assignment.

#### **BIO 101: General Biology I (3 Credit Units)**

Morphology and life cycles of plants and animals. General study of plant and animal groups from algae/fungi to chordates. Structural and functional study of plants and animals (cells, tissues, organs and systems). Elements of biological chemistry, inorganic and micro molecules relevant to life-enzymes and cellular metabolism. Taxonomic, physiologic and developmental studies of plants and animals. Reproduction, genetic-hereditary substances, mechanism of nuclear division and stem cell formation; Evolution, natural selection and evolution as a continuous process. Study of the environment from the ecological viewpoint.

#### **PHY 101: General Physics I (3 Credit Units)**

Elementary Kinematics and vector algebra. Newton's laws of motion. Static forces acting on a human body. Elasticity and strength of materials. Momentum conservation; application to contusion and fracture during impacts, and to similar medical situations; conservation of energy; the first law of thermodynamics; applications to metabolism and work done by various organs of the body. Angular momentum and torque. Harmonic motion and diffusion.



Applications to osmotic pressure and passage of substances through capillary walls. Molecular motion in gases: distribution functions and the Boltzmann principles. Intermolecular collisions and transport processes. Equilibrium in external fields; the centrifuge and measurement of molecular weight.

Rectilinear motions: Newton's laws of motion, Gravitation. Satellites and radial escape velocity. Work and energy, friction and viscosity. Orbital motion, moments of inertia and conservation angular momentum and energy of rotation. Simple harmonic motion of simple systems. Simple properties of solids – elasticity, etc. Surface tension and capillary effects.

### **CHM 101: General Chemistry I (3 Credit Units)**

Principles of atomic structure, isotopes, empirical and molecular formula; nuclear structure, atomic fission and nuclear energy. The electronic structure and arrangement of electrons in atoms; Electronic configuration of 1<sup>st</sup> and 2<sup>nd</sup> rows of elements. Properties of gases: equation of state, kinetic and molecular theory of gases, and heat capacities of a gas. Equilibrium and thermodynamics; Thermo chemistry, Enthalpy of reactions, bond energies, thermodynamic cycles, Hess' law, Born Haber cycle, the meaning of  $K_a$ ,  $K_p$  and  $K_c$ , Le Chatelier's principle,  $pH$ , ionic equilibrium, buffers, indicators, solubility product, common ion effect, redox reactions. Electrode potentials, electrolytes and electrolysis. Kinetics: The Position of equilibrium and the rate at which it is attained Factor influencing the rate of reactions. Introduction of activation and catalysis

### **GST 114: Introduction to Information Communication Technology I (2 Credit Units)**

Concept and scope of information technology, Computers for information storage, information seeking, information processing and information transmission. Elements of computer system, computer hardware and software; numeric data, alpha numeric data; contents of a program and processing. Computer organization, block diagram of a computer, CPU, memory. Input devices; keyboard, mouse etc; output devices; VDU and Printer, Scanner and Plotter. Electrical requirements, inter-connections between units, connectors and cables.

Secondary storage; magnetic disks – tracks and sectors, optical disk (CD and DVD Memory), primary and secondary memory: RAM, ROM, PROM etc. Capacity; device controllers, serial port, parallel port, system bus. Exercises on file opening and closing; memory management; device management and input – output (I/O) management with respect of windows. Installation concept and precautions to be observed while installing the system and software. Introduction about Operating Systems such as MS-DOS and Windows. Special features, various commands of MS word and MS-Excel. About the internet – server types, connectivity (TCP/IP, shell); applications of internet like: e-mail and browsing. Various Browsers like WWW (World wide web); hyperlinks; HTTP (Hyper Text Transfer Protocol); FTP (File Transfer Protocol). Basics of Networking – LAN, WAN and Topologies.

### **MTH 101 : General Mathematics (2 Credit Units)**

Algebra of real numbers and quadratic equations. Indices, surds, logarithm, binomial theorem for positive integral index. Solution of inequalities, polynomials and their factorization, rational function and partial fraction. Trigonometry: definitions and properties of trigonometric functions, addition formula and other basic identities. Differential calculus: Formulae for sum, product and quotient, the chain rule, differentiation of definite and indefinite algebraic functions; Trigonometric, exponential and logarithmic functions, maxima and minima, tangents and normals. Fundamental theory of integral calculus, Simple applications to areas and volumes, methods of integration. Elementary Statistics.

**GST 115 Introductory Cytology and Genetics (2 Credit Units)**

The study of Cell Science i.e. Basic and Applied, along with their modern developments including cell cycle and check-point, cell organelles, with special emphasis on chromosomes, their structure, chemical details and behaviour as well as their role in evolution and plant improvement. The Mendelian and Post-Mendelian developments as well as extra nuclear inheritance and sex-determination, development of gene concept and structure, genetic code, gene expression and gene manipulation should be extensively covered. Different steps of recombinant DNA technology and genetic engineering including cloning, genomic libraries, gene transfer and transgenesis with DNA finger-printing for the analysis of genetic diversity, tissue culture and cell fusion techniques.

**FRE 101 & 102: Functional French I & II (2 Credit Units each for FRE 101 and FRE 102)**

Objectives: The students from English speaking countries must be taught basic functional French that would enable them speak, read, write and interact with people across borders or with people from other language background. This will promote the spirit of integration and fulfil the primary aim of harmonization and mobility of health professionals within the region. The content should be according to the approved content of relevant departments of the domicile Institution.

**BOT 112: Introductory Botany (2 Credits)**

Concept of the living world, biological classifications, plant diversity and classification, tools and techniques of biological studies, cellular micromolecules and macromolecule. The cell structure and function, cellular reproduction, morphology of angiospermic plant, the angiospermic plant, the root, the stem, the leaf, the inflorescence, the flower, the fruit, the seed structure and germination. Dispersal of fruits and seeds, meristems and tissues, tissue systems, the primary body stem, root and leaf, secondary growth in thickness, leaf fall and healing of wounds. Sexual and asexual reproduction in plants, bacteria, viruses mycoplasma in plant kingdom. Thallophyta, algae, fungi, lichens, bryophyta, pleridophyta, gymnosperms, plant nomenclature and classification of angiosperms, plant and human welfare, Mendel's law of inheritance, linkage and crossing over. Interaction of genes and mutations, structure and replication of genetic material, genetic code, transcription and translation, explain gene expression and regulation. Diffusion, osmosis and imbibitions, absorption of water, ascent of sap, transpiration, mineral nutrition and absorption, enzymes, photosynthesis, special modes of nutrition in plants. Translocation of solutes, respiration, nitrogen cycle, growth and growth hormones, and plant movements, ecology and ecological factors, morphology and anatomy of ecological plant groups, biotic community, ecosystem, soil conservation, environmental pollution, wild life and forest conservation, biofertilizers, plant pathology and pathological diseases.

**BIO 102: General Biology II (2 Credit Units)**

Laboratory tutorials and practical on variation and natural selection, population genetics: gene frequencies in a model population, gametes and mating, natural selection, founder effects and migration.

Laboratory tutorials and practical sessions on phylogenetics, prokaryotes, protists, chemotaxis and phototaxis in physarum, seedless plants, seed plants, fungi, sponges, cnidarians, flatworms, molluscs and annelids, roundworms, arthropods, echinoderms and chordates. Explorations of organism sizes, animal tissues, respiratory systems, foetal pig dissection, mammalian organs, frog dissection and organisms in a lake ecosystem etc.

**PHY 102: General Physics II (Practical: 2 Credit Units)**

Electrostatics: Coulomb's Law, electric fields, Gauss law, the electrostatic potential, Laplace's equation, point charges, continuous charge distributions and dipoles, capacitors, dielectrics and field energy. Nernst-Planck equation and membrane potentials. Debye-Huckel theory of electrolytes: Solubility and electrophoresis of proteins, quasi-static flow of charge, distribution of potential in volume conductors. Application of electrocardiography. Magnetic fields, Amperes laws; the law of Biot and Savart: Magnetic properties of matter. Faraday's law of induction. Electrical circuits, oscillators, feedback, with application to medical instrumentation e.g. pacemakers.

**CHM 102: General Chemistry II (Practical: 2 Credit Units)**

Laboratory instructions and experimental products shall be conducted for the candidates from the following subjects areas: **Physical:** Determination of heats of reaction, effect of solutes on boiling points of solvents, partition coefficient. Determination of molecular mass by Dumas and Victor Meyer methods. Measurements of rate equation and activation energy. Other experiments based on the scope of the lectures and as approved by the Department. **Organic:** Safety precaution instructions, classification of organic compounds by their solubilities in common solvents. Qualitative analysis for common elements in organic compounds identification and classification of acids and bases functional groups. Identification of the following: neutral functional groups, alcohols, aldehydes, ketones, esters, anhydrides and others. Acetylation of aniline as an example of the preparation of solid aniline derivative. An electrophilic addition reaction. **Inorganic:** Qualitative and quantitative analysis; molarity, concentration and percentage purity.

**EHS 120: Environmental Health and African Culture (2 Credit Units)**

Concept and meaning of culture; traditional African culture- its geographical and ethnographical spread, practices, its family structure, kingship system, etc. Socio-economic status and culture, political system, traditional art and music, modes of communication; Africa and processes of modernization, urbanization, changes in cultural approach to sanitation and hygiene, taboos, myths and practices, globalization, religion and cultural revival, mass media and cultural development.

**GST 121: Citizenship Education (2 Credit Units)**

Basic concepts, principles and provision of the country constitution. The national system of government in the country, the constitutional rights and obligations of citizens, meaning of citizenship, the fundamental objectives and principles of national policy of the country. Explain the term constitution, the different types of constitution, discuss the merits and demerits of types of constitution, outline some provisions of international constitution, explain the importance of international constitution, and recognize the supremacy of the national constitution over other local or national laws, process of drafting a constitution, explain the concept 'rule of law and separation of powers. Describe the structure and functions of different tiers of government in your country. Explain how revenue and resources are generated and applied by different tiers of government of your country. State the significant of right and obligation of citizens to the development of your country as well as the fundamental rights of citizen.

**GST 122: Introduction to Information Communication Technology II (2 Credit Units)**

Given a PC, name its various components and list their functions. Identification of various parts of a computer and peripherals. Practice in installing a computer system by giving connection and loading the system software and application software. Installation of DOS and

simple exercises on TYPE, REN, DEL, CD, MD, COPY, TREE, BACKUP commands. Exercises on entering text and data (Typing Practice). Installation of Windows 98 or 2000 etc. Features of Windows as an operating system: Start, Shutdown and restore, Creating and operating on the icons, Opening closing and sizing the windows, Using elementary job commands like – creating, saving, modifying, renaming, finding and deleting a file, Creating and operating on a folder, Changing setting like, date, time colour (back ground and fore ground), using short cuts and on- line help. Programming with MS-WORD: File Management: Opening, creating and saving a document, locating files, copying contents in some different file(s), protecting files, Giving password protection for a file, Page Set up: Setting margins, tab setting, ruler, indenting, Editing a document: Entering text, Cut, copy, paste using tool-bars, Formatting a document, aligning of text in a document, justification of document, Inserting bullets and numbering, Formatting paragraph, inserting page breaks and column breaks. Use of headers, footers: Inserting footnote, end note, use of comments, Inserting date, time, special symbols, importing graphic images, drawing tools, creating tables and Borders. Print preview, zoom, page set up, printing options, Using Find, Replace options, Using Tools like: Spell checker, help, use of macros, mail merge, thesaurus word content and statistics, printing envelops and labels. Using shapes and drawing toolbar, Working with more than one window in MS Word, How to change the version of the document from one window OS to another.

### **TDS 102 : Technical Drawing Skills I (3 Credit Units)**

Forms of drawing and their state of application, artistic drawings, technical drawings, orthographic drawings, pictorial drawings, important drawing equipments and maintenance of drawing instrument. Letter styles, technique and various form of lettering, guide lines, spacing of letters, lettering in maps and conventional lines. Introduction to Geometric construction, geometric nomenclature, techniques of geometric constructions, properties of planes figures and scales. Introduction to freehand sketching, design ideas, techniques of freehand sketching, graphical interpretation of production drawing, basic principles of isometric oblique drawing, freehand orthographic sketches. Introduction to projection, isometric drawing, orthographic or multi view projection. Angles of projection, theory of multi view projections, classification of surfaces and lines in orthographic projections, precedence of lines, principal planes of projection, pictorial projections, isometric projection, isometric drawing, auxiliary projection, concept of auxiliary plane, normal planes of projection, projection and elevation of auxiliary plan. Introduction to dimensioning, terminologies and application in dimensioning, leader, dimension lines, extension lines, system dimensioning, aligned system dimensioning, unidirectional system dimensioning, general rules and steps in dimensioning, purpose and principle of dimensioning from datum.

### **GST 123: English and Communication Skills II (2 Credit Units)**

Language, types, origin, characteristics, language learning skills, English language and its origin, grammar and syntax, word classes, noun and pronouns, adjectives, verbs and adverbs, prepositions and conjunctions, correlative coordinators and subordinators.

### **TDS 201 : Technical Drawing Skills II (3 Credit Units)**

Introduction to sectioning, purpose of sectioning, method of sectioning, application of different method of sectioning. Introduction to assembly of drawings, preparation of part lists, assembling of technical device, and orthographic views of simple assemblies. Introduction to projection of points, lines and planes, reference planes, projection of point,

lines in space, classification of lines in orthographic projections, orthographic projection of a line and true size (shape) of an oblique plane. Introduction to mapping, definition and purpose of maps, classification of maps, sketch maps, materials used in a sketch mapping for field or office use and procedures for making a sketch map. Introduction to building drawing, important terms used in building drawing, principles of architecture, basic elements of planning residential building, principles of planning of residential building, specification used to draw the building drawing, methods of making line and detailed drawing and tips to draw building drawing. Introduction to plumbing drawing, common graphical plumbing symbols, principles of plumbing, principles and basic elements of plumbing residential building. Application of technical drawing in sanitation and water projects.

### **CSC 201: Computer Applications (2 Credit Units)**

Conversion between different text editors, software and MS word, MS-EXCEL Starting excel, open worksheet, enter, edit, data, formulas to calculate values, format data, create chart, printing chart, save worksheet, switching, from another spread sheet. Menu commands: create, format charts, organize, manage data, solving problem by analyzing data, exchange with other applications.

Programming with MS Excel: getting information while working. Work books: Managing workbooks (create, open, close, save), working in work books, selecting the cells, choosing commands, data entry techniques, formula creation and links, controlling calculations, working with arrays. Editing a worksheet, copying, moving cells, pasting, inserting, deletion of cells, rows, columns, find and replace text, numbers of cells, formatting worksheet. Creating a chart: Working with chart types, changing data in chart, formatting a chart, use chart to analyze data. Using a list to organize data, sorting and filtering data in list. Retrieve data with MS – query: Create a pivot table, customizing a pivot table. Statistical analysis of data. Customize MS-Excel: How to change view of worksheet, outlining a worksheet, customize workspace, using templates to create default workbooks, protecting work book. Exchange data with other application: linking and embedding, embedding objects, linking to other applications, import, and export document. Internet and its Applications: Log-in to internet, Navigation for information seeking on internet, Browsing and down loading of information from internet, Sending and receiving e-mail, Creating a message, Creating an address book. Attaching a file with e-mail message, receiving a message, deleting a message.

### **ANAT 201: Human Anatomy (3 Credit Units)**

Philosophy, Methodology, Language and general descriptive terms in Anatomy. Skin, fascia, muscles, bones, joints, blood vessels, nerves, lymphatic, etc. The pectoral girdle and associated

joints (Sternoclavicular, acromioclavicular). Muscles acting on the shoulder joint, The axilla and Brachial Plexus, The Anatomy of the Breast, Blood supply. Venous drainage and lymph drainage, Flexor and Extensor-Compartments of arm, The elbow joint, and muscle acting on it. The flexor and extensor compartment of the fore-arm, Wrist Joint, and muscles acting on it, The anatomy of the hand, The blood supply and Anastomosis of the upper limb (around scapula, humerus, elbow and hand), Dermatomes of the upper limb. The front of the thigh I (Femoral triangle, femoral canal and hernia, subsartorial canal). The front of the thigh II: The medial side of the thigh; The gluteal region; The back of the thigh; The popliteal fossa; The front of the leg and the dorsum of the foot; The lateral side of the leg; The back of the leg; The sole of the foot (arches of the foot); The hip joint and the knee joint; The tibio-fibular joints, ankle joint and the joints of the foot. Gross anatomy shall include classroom lectures

and dissection sections. Examinations shall include both written and practical examinations and viva-voce. Intracellular localization of enzymes. Properties of enzymes. Enzyme kinetic and inhibition; co-enzymes and cofactors. Glycolysis Tricarboxylic acid cycle. Oxidative phosphorylation and Hexose monophosphate shunt. Membranes and transport Glycogen synthesis and breakdown. Oxidative deamination, transamination and urea cycle. Degradation of amino acid. Synthesis of fatty acids, oxidation of fatty acids. DNA replication and transcription: protein biosynthesis and regulation. Cholesterol: Chemistry, synthesis and breakdown. Biochemical basis of hormone action. Drug metabolism. Mineral metabolism and role of calcium in bone formation. Introduction to Nutritional Biochemistry. Shape and frame-work of the thorax, Surface Anatomy The lungs, Apertures of the Thorax, Respiratory movements, Superficial Structure (the muscles), Intercoastal arteries and veins, Internal thoracic artery, Mediasternum (superior and inferior) middle, anterior and posterior), Lateral parts and pleurals, Roots of the lungs, Lobes of the lungs, Intrapulmonary structure, The trachea, Sternocostal surface of the heart, Surface anatomy of the heart Chambers of the heart Structure of walls of heart – Myocardium and conducting system, The aorta Oesophagus Thoracic duct, Sternal joints, Sternocostal joints, Interchondral joints Costochondral joints, Costovertebral joints, Joints and Ligaments of the Vertebral column, anterior and posterior Abdominal walls, Peritoneum, Inguinal Canal and Hernia; Arteries, Veins, Lymphatics of GIT; Stomach, small & Large Intestine, Liver, Spleen, Pancreas, Kidneys & Suprarenal Glands, Bones and Joints of Pelvis, Pelvis and Perineum, Anatomy of male and female reproductive systems, Superficial/Deep perineal pouches.

#### **MCB 201: General Microbiology (2 Credit Units)**

History and scope of microbiology; the general characteristics of microorganisms. Prokaryotic and eukaryotic microorganisms. Bacterial morphology and cell structure. Growth and Reproduction of microorganisms. Introduction to medical microbiology (scope of microbiology, history, definition. Areas of microbiology - Parasitology, Bacteriology, Virology, Mycology. Structure and functions/ Replication/Reproduction and characteristics of disease causing organisms. Microbial ecology, metabolism, antimicrobial agents, nutrition and growth. Systematic classification of disease causing microbes (Bacteria, viruses, parasites, fungi). Normal microbial flora. Infection/disease, Differences between infectious and non-infectious diseases. Pathogenicity and pathogenic mechanisms of disease causing microorganisms. Mechanism of infection (Inflammatory response, fever and immunity). Antimicrobial agents. Prevention and Control of Microbial Diseases, microbes in relation to environment agriculture and industries, etc.

#### **BCH 201: General Biochemistry (2 Credits Units)**

Chemistry of amino acids, amino acids as building blocks of proteins. Reaction of amino acids. Properties of peptide bond. Levels of organization of proteins. Reactions of proteins. (b) Chemistry of sugars. Storage polysaccharides, reactions of carbohydrates. (c) Chemistry of fatty acids, tryglycerides classification of lipids. Chemical reactions of fatty acids. (d) Chemistry and functions of Nucleic acids. Biosynthesis of nucleic acids. Protein biosynthesis. (e) Chemistry of vitamins and coenzymes. Vitamin deficiency diseases. (f) Immunoglobulins. Intracellular localization of enzymes. Properties of enzymes. Enzyme kinetic and inhibition; co-enzymes and cofactors. Glycolysis Tricarboxylic acid cycle. Oxidative phosphorylation and Hexose monophosphate shunt. Membranes and transport Glycogen synthesis and breakdown. Oxidative deamination, transamination and urea cycle. Degradation of amino acid. Synthesis of fatty acids, oxidation of fatty acids. DNA replication and transcription: protein biosynthesis and regulation. Cholesterol: Chemistry, synthesis and breakdown. Biochemical basis of hormone action. Drug metabolism. Mineral

metabolism and role of calcium in bone formation. Introduction to Nutritional Biochemistry. Review of general biochemistry; Chemical elements and the periodic table; electronic configuration; electronic orbital; valence of atoms; types of chemical bonds; metals and non-metals; acids and bases; Lewis conception; Carbon, sp<sup>3</sup> hybridization; the tetrahedron and covalent bonding; functional groups; water and its special properties. Introduction of the cell and hierarchy of organization of living things: macromolecules, organelles, cells, Metabolism, Enzymes, Hormones, Biochemical degradations, Detoxification, Biochemical techniques in disease screening and detection; Assessment of toxicant in environmental media etc.

### **PGY 201: Human Physiology (3 Credit Units)**

Introduction and History of Physiology. Structure and function of cell membranes with emphasis on transport across cell membrane. Biophysical principles. Osmosis, diffusion, active transport. Homeostasis and control systems. Body fluid compartments, blood formation, functions, Haemostasis, haemorrhage, Electrophysiology of the heart, cardiac cycle, venous return, circulatory adjustment to exercise, physiology of respiration. Systemic or greater circulation, pulmonary or lesser circulation. The Heart, Chambers, Capacity, Heart walls: Epicardium, Myocardium, Endocardium and pericardium. Heart valves: atrioventricular and semilunar, Cardiac cycle and phases: systolic (contract) and diastolic (relaxation) Mechanism of valve functioning physiological properties of cardiac muscle. The basis of heart Automaticity (a) Sinoatrial node (paced maker) (b) Atrioventricular node (c) The Bundle of Hiss, Stanius experiment Heart Block, fibrillation, Refractory period of the cardiac muscle: Extra systole External manifestations of cardiac Activity: Apex beat, Heart Sounds, Bioelectrical activity of the heart and its recording: standard leads (ECG) chest leads, Control of cardiac Activity Nervous control.

Reflex control: Intracardiac reflex responses – Reflex effects of the pericardium, reflex effects of the coronary pulmonary, atria and ventricular vessels, Effects of vascular reflexogenic zones, Reflex effects of visceral receptors. Effects of the cerebral cortex on cardiac Activity. Humoral control of Cardiac Activity, effects of electrolytes: K<sup>+</sup> & Ca<sup>2+</sup> ions, effects of neurotransmitters, effects of hormones: Thyroxine, insulin, Gonadal hormones, Adrenaline and nor adrenaline. Heart Rate balance, Adaptation to abnormal environments, metabolic rate and temperature regulation.

### **EHS 201: Ecology and Environmental Studies (2 Credit Units)**

Introduction to principles of ecology, nature of our environment, atmosphere, chemical, physical and biological factors in the environment, biochemical cycles (carbon cycle, Nitrogen cycle Hydrological cycle), Basic environmental concepts and theories, microbial and parasite ecology, population ecology, food chain and web, energy flow through the biosphere, biotic communities and ecological succession, relationships and interdependence of organisms, human ecology etc.

### **EHS 203: Introduction to Environmental Health (2 Credit Units)**

Definitions, concepts and theories. History of Environmental Health, Environmental health determinants of health status. Technologies for prevention and control of environmental decay. Environmental Health functions including waste management; food hygiene and control; pests and vectors and integrated Vector Management housing and sanitation; Community Led Total Sanitation (CLTS); WASH Community Management strategies; epidemiological investigation and control; air quality management; occupational health and safety; water resources management and sanitation; noise control; protection of recreational environment; radiation control and health; control of frontiers, air and sea ports and border

crossing; pollution control and abatement; educational activities (health promotion and education); promotion and enforcement of environmental health quality standards; collaborative efforts to study the effects of environmental hazards (research); Environmental health impact assessment.(EHIA).

### **EHS 205: Hygiene Education and Health Promotion (2 Credit Units)**

Concepts and theories in health education and health promotion, principles, methods and strategies, community mobilization, Information, Education and Communication in Environmental health. Comparative assessment. Technologies for Information-Education-Communication in Environmental Health (I.E.C.). Sanitation through participatory approach; promoting sanitation through children (Child to Child approach), Life-Skill based hygiene education, Improving and assessing sanitation in communities and schools; PHAST Initiatives, Using advocacy, social Mobilization and programme commutation to promote sanitation in selected communities. Social marketing for sanitation programmes, private-sector involvement or partnership in promoting sanitation; planning; Principles of sanitation in Emergency situations; case studies in community sanitation. Appropriate approaches and methods in health promotion, development and use of audio-visual aids, learning and adult learning, community entry and community needs assessment, communication in health. Planning and implementation of health education and promotion programme, community mobilization and participation, behaviour change communication (BCC), school Health programme, etc. Inter-personal communication skills. Definition of counselling; exposure to specific skills that promote appropriate counselling; use of appropriate counselling techniques – test timing, pre-test counselling. Anonymity versus confidentiality, reporting requirements, test result interpretation, post test counselling – wellness strategies, crisis intervention, behaviour change, partner notification and referral.

### **EHS 207: Climate Change and Contemporary Issues (2 Credit Units)**

Definition of climate change and the climate system, the nature of climate change, green house, climate change: causes, indicators, impacts and ways to reduce global warming. Define solar ultraviolet radiation, causes, effects on human and animal health, the effect on aquatic organisms, the effect on air quality, effects on materials and structures, photo degradation, microbial diversity, microbial decomposition. Ozone and ozone layer, health risks associated with the ozone layer: The absorption of solar energy, hazards to humans, the effects on the eye, effects on immune system, effects on the skin. Ozone depletion, risk assessment of ozone depletion: quantitative assessment, cataract, sunburn, skin cancer, other opportunistic infections, mitigation with replacement of chlorofluorocarbons.

### **EHS 202: Fundamentals of Epidemiology (3 Credit Units)**

Historical development, definition, scope and application of epidemiology; Introduction to the basic principles and methods of epidemiology. Epidemiologic model of disease occurrence; Causal inferences in disease causation – Unifactorial model, multi-factorial model, Web of causation, criteria for asserting etiological relationships in disease occurrence; Agent-Host Environment relationships in disease occurrence; Person-Time-Place Descriptive Epidemiological Model; Time-Relationships in disease occurrence – natural history of disease, time of onset of a disease, time of diagnosis of disease, incubation period, time incidence function of a disease, mode of transmission of disease, epidemic curves, epidemiologic year of a disease, Cyclicity (secular versus seasonal) in disease occurrence; Strategies and methods in the prevention and control of diseases; Quantitative and qualitative assessment of screening procedures and their strength. Measurement of health status; Assessment of etiologic relationships based on exposure and susceptibility factors – relative



risk, attributable risk, attributable risk percent, population attributable risk and odds ratio; Basic epidemiologic study designs – cross-sectional studies, cohort or prospective studies, case-control studies, randomized clinical trials and community trials. Survey of the applications of epidemiology to diseases, injuries, and non-disease health problems, cause effect relationship. Concept of surveillance and Integrated Disease Surveillance and Response (IDSR), International Health Regulation, Screening for diseases, Planning and Evaluating Community Health Services

#### **EHS 204: Environmental Health Services and Practice (2 Credit Units)**

Characteristics of environmental health practice. Environmental health practice in the implementation, regulation and enforcement of environmental health functions at different settings (home, schools, market places, recreational and hospitality facilities, workplace, industries; and development projects etc. Tools of environmental health practice, method of assessment of environmental health practice, skills of environmental health practitioners, roles of environmental health officers and regulators. Ethics in environmental health practice. Inter and intra sectoral collaboration in environmental health practice.

#### **CHM 206: Introduction to Organic Chemistry (2 Credit Units)**

Definition and concept of Organic Chemistry; formation, types of bond and bond energy; chemical reaction; addition, substitution (nucleophilic and electrophilic); thermodynamic and kinetic control of products. Functional groups and functional group analysis. Nomenclature, structure, basic mechanism and functions of Aliphatic and Aromatic compounds. Stereochemistry and stereoisomerism. Steroids; structure and function. Organometallic compounds; hemoglobin, chlorophyll etc; Pesticides and Organo toxins.

#### **EHS 208: Immunology and Immunization (2 Credit Units)**

Fundamental principles of immunology with emphasis on the nature of antibodies and antigens, blood groups, antigen-antibody reactions, hypersensitivity, types of immunity and factors affecting immunity, vaccines and vaccination, serological vaccine efficacy and coverage surveys. Principles of immunization; Immunizable diseases, immunization techniques and schedules, cold-chain management, and vaccine development technologies, immunological techniques, adverse reaction etc

#### **EHS 210: Health Psychology and Sociology (2 Credit Units)**

Introduction to sociology, psychology and anthropology, Biological basis for human behaviour sensation, perception, motivation and emotion, Describe human development, learning and practices, Explain the role of culture, communication and human relationship and public participation, Describe the importance of indigenous knowledge, belief and health practices, Describe social, psychological and biological aspect of environmental planning and built-up environment, Discuss factors relating smoking, alcoholism, drug addiction emotional disorder. Describe factors in inequalities on health. Identify sources of psychological disorders, stresses, and illness behaviours in relation to social medicine and medical psychology. Describe the role of human behaviours in illness and disease causation. Discuss social determinants of health, social epidemiology and health service utilization behaviours.

Application of social science theories towards understanding behavioural aspects of health and medical care. Considerations of human behavioural dimensions in illness and disease, prophylactic behaviour, the role of culture, role of social institutions, stress and health, compliance behaviours, social epidemiology, etc. Also covers topics in social health including

Smoking, alcoholism, drug addiction, obesity and nutritional behaviour/disorders, health services utilization behaviour, emotional health and personality disorders, religion and health.

#### **EHS 212: Environmental Pollution and Control (2 Credit Units)**

Concept of pollution, definition, causes, Water, air and land pollution and contamination, food safety and hygiene pollutants and contaminants in the environment; effects; Monitoring and assessment of pollutants and contaminants exposure patterns to pollutants and contaminants; eco-toxicology control methods. Laboratory assessment of pollutants from environmental media, measurement of noise using eudiometry, Assessment of pollutant in different environmental media e.g. Air, water, Soil and Food. Introduction to pollution Laboratory and methods etc

#### **EHS 214: Basic and Biostatistics (2 Credit Units)**

Statistical data: types, sources and methods of collection. Presentation of data: tables, charts and graphs. Errors and approximations, frequency and cumulative distributions. Measures of location, partition, dispersion, skewness and kurtosis. Rates, ratios, and index numbers. Scope of statistical methods in biology and agriculture. Measures of location, partition and dispersion. Elements of probability. Probability distributions: binomial, Poisson, geometric. Hypergeometric, negative binomial, normal. Estimation (point and interval) and tests of hypotheses concerning population means, proportions and variances. Regression and correlation. Non-parametric tests. Contingency table analysis. Introduction to design of experiments. Analysis of variance. Definition, types of data, classification and types of samples, sampling techniques data distribution descriptive and inferential statistics. Vital and health statistics. Use of computer based statistical packages – e.g. statistical package for Social Sciences (SPSS), Epi-Info, Epidata Stata, Stacia, etc.

#### **EHS 216: Urban Planning and Sustainable Development (2 Credit Units)**

Urban renewal of built up environment and provision of essential services: road, drainage etc. Describe layout planning and land use, development, control and land scaping. Describe national and international partners which support sustainable development – policies legislation, Agenda 21, Rio declaration, MDGS, WSSD, NEPAD etc. Concept of urban and regional planning, history of planning and contemporary planning issues – sustainable development; regeneration and pollution core modules e.g. contemporary human geography, earth & ecological systems; planning and built environment; society, space, policy and economy. Urban poverty and planning; town scopes; societies, culture and urban explosion; rural poverty; GIS, EIA, Environmental and spatial qualities; prediction of effect; scenario development; multi-criteria analysis; potential solutions, environmental health feature, flood protection, rural and coastal infrastructure, industrial activities and pollution; spatial planning of industrial sites, etc.

#### **EHS 218: Human Nutrition and Dietetics (2 Credit Units)**

Definition concepts and historic perspectives of nutrition, food nutrients and classification; nutritional value of food and its effect on health; food production, storage, processing, transportation, purchasing, preservation, preparation safety, and diet therapy; balance diet. Breastfeeding, selection and formulation of weaning diets; family menu and budgeting, socioeconomic status of the family, various methods of nutritional assessment, biochemistry, biochemical assessment, anthropometric measurement, 24hr dietary recall. Physical and laboratory analysis of nutrients (haemoglobin estimation etc). Diet control in illness, obesity and weight control, local foods, nutrition through the life cycle (diet for different ages and

condition), food labelling, food miles and sign posting. Basis for nutritional intervention, food protection, indicators of malnutrition.

### **EHS 301: General Pathology (2 Credit Units)**

Concepts and scope of pathology. Causes and classification of diseases; Cytology; Organ damage and sequel; Inflammation: types and causes, signs, functions, types and mechanisms; Infection: types and causes of infection. Body defence mechanism, causes and types of infection, some important bacterial, fungal, and viral infections including Tuberculosis, Candidiasis and HIV/AIDS. Growth disorders. Hyperplasia, hypertrophy, dysplasia, dystrophy and malnutrition. Tumours: aetiology, types, classification and characteristics. Cysts: formation and classification; Developmental anomalies or disturbances; Effects of ionizing Radiation on human tissues. Trauma, injuries and dislocations and bleeding. Systems pathology: disorders of blood cells, Body fluids (oedema), febrile conditions (fever) cardiovascular diseases, the heart and selected diseases of the respiratory system, gastro-intestinal tract, bones and joints, skin, endocrine glands, kidney, liver, and central nervous system, Diagnostic and forensic pathology.

### **EHS 302: Health Economics (2 Credit Units)**

Definitions, theories and concepts. Health care financing and their implications to health care delivery. National Health Insurance Scheme, Cost recovery strategies, private sector participation. Socio-economic cost of ill health, Indicators for assessment of cost of ill health. Factors affecting access to health services Economic implications of disease – man-hour, DALY's etc. CEA, CBA etc. Application of economic approaches to planning and improving health services in the community. Understanding the basic principles of health economics: financial, economic goods and services, economic needs, opportunities and costs, scarcity, demand and supply. Cost effectiveness and cost benefits. National economic objectives, role of the consumer in the capitalist economy, role of government in the economic system, budgetary procedure, the national income and distributions, fiscal policy, approach to financial planning, consumer health, Health Care financing. National health Insurance schemes.

### **EHS 303: General Parasitology (3 Credit Units)**

Introduction to major human parasites of public health relevance, classification of parasites, Phylogeny of parasites parasite physiology; host parasite relationship; evasive mechanism; life-cycle pattern and host specificity, parasite ecology; infection and infestations Pathology, pathogenesis and Symptomology of parasitic diseases e.g. malaria, amoebiasis, schistosomiasis, onchocerciasis, etc. Screening and Diagnosis of endemic parasitic diseases; Strategies in parasitic diseases control; Emerging and re-emerging parasitic diseases; Chemotherapy and Chemoprophylaxis, Drug resistance etc. Prevention and Control of parasitic infections.

### **EHS 304: Food Hygiene and Safety (2 Credit Units)**

Concept of Food chain and food security, food hygiene, Food production, Handling, Transportation, Storage, Preparation. Food Premises, Sanitary Requirements of Food premises, Food Handlers, Hygiene and Health Requirements of food handlers. Food spoilage and food preservation, Food poisoning and food Infections, their prevention and control; Food safety. Sampling of food, Food Quality Control, Food safety laws and Regulations. Licensing of food-preparing and water packaging premises. Licensing Liquor-selling premises. Organization of Workshop programme for food handlers on food safety and hygiene. Describe the general overview of the procedure and process of meat hygiene and inspection.

**EHS 305 Biomedical and Health Care Wastes (3 Credit Units)**

Definition and classification of biomedical and health care waste. Sources and health impacts of biomedical and health care waste. Planning in biomedical and health care waste management, handling and transportation of biomedical and health care waste. Waste minimization, recycling, and reuse. The role of legislation in biomedical and health care waste, treatment technologies for biomedical and health care waste. Disposal methods in biomedical and health care waste. Health and safety rules for personnel and associated workers. Infection control and emergency response, training and retraining in biomedical and health care waste.

**EHS 306: Sanitation Technology (2 Credit Units)**

Concept and definition of ecological sanitation; crisis in eco-sanitation; rapid population growth, Excreta and waste water disposal technologies; water scarcity; low cost technologies, types of toilets, composting and vermin-technological approaches to sanitation; Methods of nutrient recovery; merits and demerits of modern sanitation technologies, sewage and waste water separation and treatment.

**EHS 307: General Entomology (3 Credit Units)**

Introduction to Entomology; Classification and characteristics of insects with particular reference to vectors of diseases. Insect ecology, Insect Anatomy and physiology, Environment and entomology. Methods of insect control, Biological, chemical and physical, pest control (integrated pest management) Insecticides; classification, formulation and application of insecticides. Health implication; handling and safety methods, insect sterilization techniques. International conventions and national policies on pesticides use. Definitions, external structure of insects, physiology and Anatomy of Insects, special terms used in sexual and asexual reproduction, nervous system and neuro-muscular co-ordination. Life cycle of Insects, economic and Public Health significance, classification of Insects. Pesticide, formulations and Application in Env. Health, Pesticides, classification, characteristics and generic names, precautions and safe use of pesticides. Banned chemicals in Pest/Vector control, Insect-borne diseases and their mode of transmission. methods of controlling Insect Vector, Scientific name, stages of development, economic, significance and methods of control of field pests Arthropod, Venoms, defence secretions and Allergies. Stored products and household Pest, health hazard associated with Insecticides use in household or stored products

**EHS 308: Sanitary Inspection of Premises (2 Credit Units)**

Concept and principles of inspections. Procedure and methodology of premises inspection. Types of premises. Tools for inspection, Report writing. Guidelines, regulations and enforcement. The relationship between Housing and Environmental Health, definition of a house, characteristics of a house and types of Housing conditions. Building Regulations relating to Environmental Health, building Measurements and Interpretation, inspection of living or residential premises, inspection of Regulated Premises, inspection of Schools. Inspection & Sanitation of Trade Fair, camps and Recreational Sites. Technical Report format of a Premises, hazard associated with poor housing

**EHS 309: Primary Health Care (2 Credit Units)**

Development of health system, concept and principles of primary health care services. Components of PHC. Structures and organization. Elements of PHC, Oral re-hydration therapy, screening, disease surveillance, immunization techniques, cold chain technology, Essential drugs: drug revolving fund, Control of common endemic diseases, reproductive

health, maternal and child health etc. Resources for PHC delivery, SWOT Analysis of PHC. Participatory techniques in PHC delivery. Maternal and Child survival strategies etc

### **EHS 310 : Environmental Biotechnology (2 Credit Units)**

Introduction to biotechnology, types of biotech, methods in biotech, microbial ecology, environmental microbiology, bioremediation and Biodegradation; Application of genetic engineering in environmental health. Insect sterilization techniques, Biological control measures vis-à-vis the more traditional use of insecticides and larvicides. Implications for environmental pollution and toxicity.

### **EHS 311: Basic Pharmacology (2 Credit Units)**

Definition and concept of pharmacology; Divisions of pharmacology and their applications; Terminologies and abbreviation; Types and nature of drugs; Pharmacodynamics; Pharmacokinetics; classification of drugs and their importance; controlled drugs, drug use, abuse and addiction; Self medication; introduction to chemical toxicology; General principles of management of poisons.

### **EHS 312: Control of Communicable and Non Communicable Diseases (2 Credit Units)**

Definition, description and classification; Epidemiological patterns. Stages of diseases prevention. Primordial, Primary, Secondary and Tertiary. Control methods: Biological, Chemical, Environmental and Chemotherapy. Strategies for drug delivery: Selective targeted and mass chemotherapy; Emerging and re- emerging diseases. Definition, description, classification of non-communicable diseases and disorders that are of major public health significance in the country.. Epidemiological patterns, risk factors, signs and symptoms; methods of prevention and control including those for behaviour modification, enforcement, and engineering measures. Examples of diseases/disorders considered include: hypertension, coronary heart disease, diabetes mellitus, major genetic disorders including sickle cell anaemia, cancers (breast, lung, liver, ovary, cervix, leukaemia, lymphomas, etc), asthma, ulcer, among others. Some non-disease chronic conditions with serious health implications such as obesity, nutritional deficiencies, drug abuse, and alcoholism.

### **EHS 313: Environmental Management (2 Credit Units)**

Definition and concept. Characteristics of different environmental media (air, water, soil), Environmental approach to air, water and land pollution. Environmental, effects of technological advances, radiation noise, pollution of the biosphere. Occupational hygiene; Mycotoxins and nitro-compounds in the environment. Environmental degradation; methods of environmental assessment e.g. remote sensing and GIS, EIA, HIA. Tools for Air, water and soil analyses. Management of degraded environment, re-forestation, erosion control, integrated vector management, integrated waste management, pollution control, international measures to control global warming and climate change remediation meteorology.

### **EHS 314: Housing /Building Construction (3 Credit Units)**

Introduction to Housing. Housing standards. Urban and rural housing. Housing and Health. Building technology- drawing and reading of plan. Housing codes, edicts, or ordinances, laws and legislation of the various Governments levels. International Legislation on Housing. Criteria for building approval. Role of Environmental Health Professionals in building approval and registration.

### **EHS 315: Public Health Management of Pesticides/Chemicals (3 Credit Units)**

Definition and sources of pesticides/chemicals used in public health, routes of exposure to chemicals, adverse effects of pesticides/chemicals on human health. Assessment of human health

risk exposed to pesticides/chemicals, environmental effects of chemicals/pesticides. Groups and modes of actions of pesticides/chemicals, management of toxic chemicals, personal protection, environmental protection, first aid for pesticides poisoning and medical treatment of pesticides.

### **EHS 316: Environmental Health Services in Emergency Situations (2 Credit Units)**

The Basics of disasters preparedness, definition of hazards, extreme events, disasters, conflicts, emergencies, vulnerability and low resilience. Examine human actions that increase vulnerability to disasters, describe vulnerability assessment, prevention and mitigation, emergency preparedness, planning and capacity building, rehabilitation reconstruction and recovery. Explain procedure of disinfecting water in emergencies, diseases related to water and sanitation, summary of disinfection methods, disinfection selection criteria, water clarification, water disinfection, disinfection of shallow wells, water ponds and reservoirs, action plan for treatment of water during emergencies . Communicable diseases following natural disasters, epidemic and endemic diseases associated with natural disasters, waterborne diseases, communicable diseases associated with crowding, vector-borne diseases, other diseases associated with natural disasters, and disaster-related disruptions. Management of dead bodies during disasters, prevention of communicable diseases following natural disasters, safe water, sanitation, site planning, primary health-care services, surveillance/early warning system, immunization and prevention of vector-borne diseases. Structure, roles and collaboration of agencies. Resources mobilization, allocation and management.

### **EHS 317: Environmental Health Information Systems (2 Credit Units)**

Concepts, procedure and structure. Study of contemporary Environmental and health information systems especially as used in morbidity surveys, disease surveillance systems, disease registers, etc. Also includes introduction to computer simulation techniques and life-table techniques. Medical and health data base management; intranet, internet and extranet applications; e-library; geo-informatics information globalization and teleconferencing.

### **EHS 318: Introduction to Demography (2 Credit Units)**

Introduction to the principles and methods of demography. Sources of population data; population dynamics and health implications, population structure and population movement. Census: types, methods, principles and practice. Applications of census data. Population data and the planning of social services. Demographic transitions and health/disease patterns and services. Indices of population, health and development, life table techniques and interpretation of related indices.

### **EHS 319: Health Safety and Environment (2 Credit Units)**

Concept, responsibilities, policies and procedures for handling hazardous chemicals at workplaces and homes. Development and implementation of safe work practices and control measures. Pollution prevention and good housekeeping practices, Storm-water pollution and its management., safety of indoor environment , contaminants and conditions that may adversely impact health outcomes. Training and retraining of workers in work environment, safe work practices and the use of personal protective equipment (PPE). System safety and understanding the complexity and failure of industrial systems and system safety. Safety issues generally as they affect facility workers. Process safety, management and hazards analysis, auditing and incident investigation. The relationship and overlapping of health and environmental issues. Bio-safety (including pathogenic microorganisms), measurement of bio-safety levels in laboratories, chemical Safety, proper use of hazardous chemicals, material safety, hazardous waste requirements, labeling and packaging, chemical redistribution,

controlled substances and chemical terrorism. Radiation Safety, proper use of radioactive materials and instrumentation and management of radioactive and electronic waste.

### **EHS 320: Water Resources Management (2 Credit Units)**

Water pollution and sources, sources of water supply, protection of sources of water supply, characteristics of a sanitary well, shallow and deep wells, disinfection of wells and water purification. Methods of water treatment in the home, household water filters, water storage facilities, conventional treatment of water, characteristics of a water treatment condiment area, diseases associated with water, water sampling in environmental health, indicator organisms and micro-organisms culturing, hardness in water, treatment for odour in water, assessment of water quality and process of management and prevention of pollution of their sources.

### **EHS 322: Reproductive Health (2 Credit Units)**

Public health aspects of human sexuality and family planning. Health resources and family size relationship, birth control, and family planning methods, prenatal, perinatal and postnatal health care services application of amniocentesis, alpha-fetoprotein (AFP), chorionic villus sampling (CVS), percutaneous umbilical blood sampling (PUBS), magnetic resonance imaging (MRI), non-stress testing (NST), ultrasonography, hematological tests, and other fetoscopic procedures. Relationship between pregnancy and diet, sleep, exercise, cigarette smoking, alcohol, drugs use, exposure to toxic substances, radiation including X-rays and VDTs), diseases (HIV/AIDS, rubella, sexually transmitted diseases, autoimmunity, diabetes, hypertension, tumours, kidney disease, hepatitis, anaemia, genetic abnormalities, blood group incompatibility, etc

### **EHS 324: Biometeorology (2 Credit Units)**

Definitions, concept and importance of biometeorology, description and definition of the following terms: weather, temperature, low and high air pressure, winds and ocean currents, clouds and precipitation, evaporation and evapo-transpiration. Define thunderstorms and state their causes. Define human biometeorology, wind chill, allergens and their health implications. Describe humidity, evapo-transpiration of forests and vegetation, reflection, transmission and absorption of solar lights in plants. Explain the importance of sensible and latent heat fluxes from surface of the atmosphere. Describe oceanography and release of dimethyl sulphide by biological activity. State the impact of biological activity on atmospheric aerosols. Relevance of study of biometeorology on aviation and maritime safety.

### **EHS 401: Environmental Toxicology (2 Credit Units).**

Introduction to chemical pathology and environmental toxicology. Toxicodynamics and toxicokinetics. Pesticides, heavy metals, radioactive materials, food additives, animal toxins, phytotoxins, plastics and psychogenic drugs. Toxic pollutants in air, land and water. Exposure pathways, standards and health implications. System, Organ, Tissue and Cell pathophysiology. Concept of LD and LC. Dose response analysis. Probit analysis.

### **EHS 403: Environmental Health Laboratory I (2 Credit Units)**

Introduction to laboratory science; Importance and functions of Environmental Health laboratory; General lab. Construction; Safety precautions in the lab; Preparation and storage of reagents; Instrumentation: Microscopes, autoclaves, incubators, sterilizers, fridge/ freezers, hot air oven, lasers, gas chromatography, spectrophotometer, colorimeter, audiometer, dosimeter, cryostat, PCR etc. Quality assessment and quality control, concept of laboratory log book and record keeping. Field trip to various environmental facilities such as water treatment plant, waste water

treatment plant, solid waste management facilities, public health laboratories, markets, selected industries, etc.

**EHS 405: Environmental Health Services Administration (2 Credit Units)**

Concepts, theories and application in Environmental health. Institutional arrangement, staffing and funding. Guidelines in environmental health administration. Supervision and monitoring, quality assurance, equity, cost controls, organizing, inter and intra sectoral collaboration. Budgeting, work plan and programme development, implementation, monitoring and evaluation.

**EHS 407: Entrepreneurship in Environmental Health (2 Credit Units)**

Concept of an entrepreneur, sources of capital in environmental health, private practice in environmental health. Providers and client relationship. Types of ownership, sources of capital, ethics, management of resources (equipment and materials), resource levelling and crashing. Feasibility studies, cost analysis and book keeping, scheduling, job loading and job sequencing, service provision, planning and control. Inspection and testing methods, introduction to quality control. Best practices: Group and individual implementation, manufacturing or assembly of selected technological products in simulated production environments, constructions of physical environmental health models of relevant use.

**EHS 409: Research Methodology and Proposal Writing (2 Credit Units)**

Research Methodology, Qualitative and Quantitative data Samples and mixed methods and sampling methods, types of data and sample size determination. Type and design of questionnaire, focus Group Discussion, Key informant interviews, Environmental Sampling, data collection, Data analysis including use of computer based analytical packages e.g. SPSS, EPI-INFO etc. Proposal and report writing: Topic selection, justification, objectives, literature search, methodology, results and discussion. Referencing.

**EHS 411: Sanitary Engineering (2 Credit Units)**

Definitions, concepts and theories of sanitary engineering. Environmental problems of urbanization and natural cycle of water. Elementary hydrology, Hydrological cycle, physical, chemical and biological principles of water and waste water treatment. Municipal services – water supply, sanitation facilities e.g. latrines and sewerage systems, urban and community storm water management, drainage layout. Local and National regulatory standards and principles of hazardous waste management.

**EHS 413: Environmental Health Practice I (2 Credit Units)**

Courses to be examined under Environmental Health practice I includes: Food hygiene and Safety, Sanitary Inspection of premises, Environmental Biotechnology, Control of Communicable and Non Communicable Diseases, Water Resources Management, Biomedical and Health Care Waste, Primary Health Care, Public Health management of pesticides and Chemicals, Entomology, Environmental Health Information system, Health Safety and Environment, Pathology and Parasitology. Environmental Health Laboratory, Sanitary Engineering, Entrepreneurship in Environmental Health, Environmental Health Administration. The structure of the examination shall be multi-choice (objective) questions (40 marks) and practical examination (60 marks).

**EHS 415: Environmental Health Planning (1 Credit Unit)**

Principles and methods of planning health care services programmes and facilities. Planning outcomes; Strategic planning; Systems theory, Chaos theory and dynamic balance; Systems



analysis; Types of technologies – definitive, halfway, competing and cost saving varieties; Effects of technology on health status; Forces affecting development and diffusion of technology; need for technology intervention; technology assessment; Technology change defined and modelled; modelling, simulation and gaming methods.

#### **EHS 417: Child Survival and Development (1 Credit Unit)**

Concept and definition of child survival; Mile stones in Child Development and early Learning; Breastfeeding; Nutrition and Growth; Immunization; Disease control, Malaria, HIV/AIDS, Water Sanitation and Hygiene (WASH) etc; Childhood diseases, their prevention and control.

#### **EHS 419: Meat Inspection, Abattoir/Slaughter Slab Management (2 Credit Units)**

Anatomy and Physiology of Food Animals; Diseases of Food Animals; Zoonosis; Describe the role and function of other agencies involved with meat inspection, slaughter management and food animal husbandry and welfare. Describe the principles of good practice in an abattoir. Describe and apply abattoir planning, construction and management in terms of standard regulations and guidelines. Explain and recognise the requirements and needs for food animal husbandry. Apply the principles of risk assessment to meat inspection and slaughter management. Practical training in meat inspection at an abattoir. Identify factors in abattoir practice and legislation that determine the hygiene and quality of meat. Perform, recognise and describe hygiene and procedures involving food animal slaughter in line with regulations.

#### **EHS 421: Public Utilities and Environmental Health (2 Credit Units)**

Definition of public utilities and recreational facilities, examples of public utilities and recreational facilities.

The role of the government and community members on the maintenance of public utilities and recreational facilities. Advantages of Public Utilities, hygiene and sanitation of public utilities and recreational facilities. Nuisances and problems associated with public utilities and recreational facilities. They must ensure that the parks, fixtures, drinking fountains, playgrounds and paved areas are always in good condition.

#### **EHS 501/502: Research Project**

Each student is to submit and defend a supervised research project in any area of environmental health.

#### **EHS 503: Seminar**

Students are expected to write and present a detailed paper in chosen area of Environmental Health research project topic.

#### **EHS 504: Occupational Health and Safety (3 Credit Units)**

Definition, scope and evolution. Principles and practice of occupational health and industrial hygiene; work environment and productivity; proxemics and ergonomics; basic occupational health team; worksite wellness promotion programs. Common occupational health problems in (industries, agricultural establishments; health care establishments; construction settings). Occupational health policies, regulations and regulatory Agencies. Environmental and occupational hazards, evaluation and measurement of exposure levels. Occupational stress, identification of the role of human and environmental factors in occupational hazards. Methods of prevention and control. Safety procedure in different occupational and safety management.

**EHS 505: Environmental Health Ethics (1 Credit Unit)**

Definition, evolution, concepts and theories; Professional ethics of Environmental health; Ethics of other professions; inter/ intra professional relationships; the role of regulatory authorities in the enforcement of professional ethics.

**EHS 506: Solid Waste Management (2 Credit Units)**

Basic concepts, nature and classification of solid waste. Theory of solid waste collection, handling and disposal. Field and laboratory sampling and monitoring of solid wastes. Analysis of municipal, industrial, hazardous solid wastes. Waste management technologies. Waste management hierarchy-minimization, recycling, waste to wealth concept etc. Solid waste and human health etc.

**EHS 507: Environmental Epidemiology (2 Credit Units)**

Definitions, concepts. Introduction to Epidemiology, Environmental epidemiology and domain of environmental epidemiology; Exposure Assessment; Descriptive Analysis, methods of investigation including the use of Time –Trend and Spatial pattern analysis; Poission Regression; Surveillance, Risk Assessment and management; pollution of air , water and soil, ionizing and non-ionizing radiation; investigation of disease clusters, emphasis is given to critical interpretation of scientific evidence relating to potential environmental hazards to health; Advances in Environmental Epidemiology, use of statistical packages (SPSS, EPI – INFO, Epidata) and vital statistic etc.

**EHS 508: Community Health Services (2 Credit Units)**

Concept and practice of Community Health, Components of Community Health, Health Indices e.g. IMR, MMR etc Immunization, Essential drugs, Disease screening and diagnosis, Drug administration; Management of common ailments and diseases in communities, use of Standing Order, referrals, Maternal and child survival strategies, community sanitation, Vector control, ethics in community health, community nutrition. Prevention and Control of endemic communicable and non communicable diseases etc

**EHS 509: Environmental Health Laboratory II (2 Credit Units)**

Methods in Environmental Chemistry, soil, water, air, food. Techniques in Parasitology and Microbiology. Assessment of Radiation effects and exposure. Pest management strategies. Pesticide formulation and use. Principles and methods for assessing Allergic hyper sensitivity associated with exposure to chemicals in the Environment. Simulation of cleaning oil spill in water and soil. Methods in gas flaring control. Field and laboratory techniques in Environmental Impact Assessment (EIA), Environmental Audit (EAD), EER, Environmental Statement (ES) etc. Methods of remote sensing, Use of Geographical information System (GIS) in Environmental Health.; Methods in HIA

**EHS 510: International Health/Port Health Services (2 Credit Units)**

Cross-boundary port health services, International organizations and agencies and non-governmental organizations (NGOs). Constitutions, conventions, treaties, international regulations and agreements. Roles of international organizations in port health. International collaboration and cooperation in port health

**EHS 511: Environmental Health Regulations, Policies and Laws (3 Credit Units)**

Evolution, Ethical considerations in the design and application of environmental health technology and innovations. Review of the legal aspects of environmental health services with particular emphasis on their implication for the development public health technology. Process of

formulation of policies, regulations ethics and making of laws. Terminologies in Public Health Laws and Court processes. Critique of existing regulation, policies and laws. Enforcement and role of environmental health officers. Professional ethics, role of environmental health council, case studies etc.

#### **EHS 512: Disease Surveillance and Notification (2 Credit Units)**

Definitions, concepts and types of surveillance and notification. Policies on Integrated Disease Surveillance and Reporting (IDSR). Rapid assessment tools and relative strength in disease surveillance. Application of remote sensing and Geographic Information System (GIS) in disease surveillance. Screening methods for communicable and non-communicable diseases etc, techniques in monitoring and evaluation.

#### **EHS 513 EIA/Health Impact Assessment (2 Credit Units)**

Definition, concept, evolution and scope. types and components of Environmental Impact Assessment and Health Impact Assessment; regulatory requirement of EIA and HIA, projects requiring EIA and HIA; procedure, techniques or process of EIA; environmental index and indicator; technical details of impact prediction; case studies; Environmental Audit; ISO 14000, 14001 etc in the management of environmental systems.

#### **EHS 514: Sewage Management (2 credit Units)**

Waste water Systems: Population studies: waste water flow rates; runoff; Groundwater Infiltration; Materials for sewers; Hydraulics of sewers. Design of Sewers/drains Combined sewers and Storm water sewers, appurtenances and special structures; Pumps and pumping stations; Design of wastewater treatment plant: Primary treatment processes: – screening, grit removal, flow measurement (weirs and flumes); Design facilities for primary treatment – radial and rectangular sedimentation tanks; Design facilities for secondary/ biological treatment of wastewater; Activated sludge process, Trickling Filters, Stabilization and Oxidation ponds. Treatment and disposal of sludge; Sources of sludge, Quantities and characteristics; Sludge dewatering methods; Uses of sludge; Sources of water supply, and their exploitation: Advanced waste water treatment methods etc.

#### **EHS 515: Environmental Health Physics (2 Credit Units)**

The environmental health physics is concerned with protecting the public and environment from unnecessary exposure to man-made and technologically enhanced natural radioactivity. Environmental surveillance for radioactivity, types of instrumentation and field-sampling technologies. Assessment of environmental impact of released radionuclides using environmental transport models, atmospheric dispersion models, biological uptake and transfer coefficients, and dose-conversion factors. Process of decontamination and decommissioning, radiation surveys and pathway analyses. Natural radioactivity and their hazards to workers and the public. Concentration of radium scales in petrochemical and phosphate (fertilizer) industries, treatment of groundwater sources contain high levels of radon and radium. Effects of radon in homes, instrumentation, testing protocols, analysis, radio-epidemiology, mitigation, preconstruction evaluations, and regulation/guideline development.

#### **EHS 516 Waste Water Management:**

Types and sources of waste water; characteristics and flow rates impacts of waste water; treatment objectives and disposal regulation, principles of applied microbiology, wastewater treatment (introduction, primary (screens and communitors, grit removal, flow equalisation, sedimentation and flotation) secondary (Tricking filters, ., rotating biological discs: activated sludge, oxidation pond) physic- chemical treatment, advanced treatment,(Ultra filtration,

reverse osmosis, activated carbon filter, UV sterilization, etc) treatment of sludge, disinfection), land disposal, sewer corrosion, design of waste water treatment units

### **EHS 517: Environmental Health Practice II**

Courses to be examined under Environmental Health practice II includes: Environmental Health Ethics, Environmental Epidemiology, Environmental Health Laboratory II, Environmental Health Regulations policies and law; Environmental Impact Assessment/Health impact Assessment; Environmental Health Physics, Immunology and Immunization; Environmental Pollution and Control; Hygiene Education and Promotion; Climate change and Contemporary Issues. Meat Inspection and Abattoir/Slaughter slab management. The structure of the examination shall be multi-choice (objective) questions (40marks), alternative to practical (20 marks) and oral examination (40 marks).

### **EHS 518: Air Quality Management (2 Credit Units)**

The Basics of Air Quality, air and components of air, air quality, ventilation, cross ventilation, sources of indoor air pollution, health problems and ventilation, ventilation standard and building codes, ventilation system problems and solutions, system designs, distribution of air, building supply and exhaust locations, air cleaners and resolving air quality problems. Measurement of air quality, Air quality modelling, etc. Air quality assessment technologies. Air pollution and air pollutant, air Pollution, air Pollutant, major primary pollutants, secondary pollutants, sources of air pollution, natural sources, emission factors, indoor air quality, health effects, effects on cystic fibrosis, effects on children, reduction efforts, control devices, particulate control, scrubbers, NO<sub>x</sub> control, VOC abatement, acid Gas/SO<sub>2</sub> control, mercury control, dioxin and furan control and miscellaneous associated equipment.

### **EHS 519: Emergency Medical Care**

Basic Skills for First Aid and safety measures for sudden illnesses and injuries in the home, playground, workplace and public places. Management of emergency conditions due to falls, cuts and abrasions, drowning, burns, electric shocks, etc. Skills in cardiopulmonary resuscitation; mouth-to-mouth resuscitation; overview of first aid and emergency care, haemorrhage, epistaxis and haemoptysis, malaena, haematuria and wounds, shock, burns and scalds, fracture, dislocation and strains, artificial respiration, first aid box & ambulance, treatment of pesticide and food poisoning, common conditions requiring first aid attention,

### **EHS 520: Water quality Management**

Definitions, concepts, principles and objectives. Standard for Drinking Water Quality. International treaties and Conventions. Procedure for water quality monitoring and surveillance. Protection of water sources including effluent and partially treated water discharge. Water purification, methods of water treatment in the home, household water filters, water storage facilities, conventional Treatment of water, diseases associated with water, water sampling techniques, indicator organisms of water pollution, hardness in water, treatment for odour in water and general assessment of water quality.



**HARMONIZED PROFESSIONAL CURRICULUM  
FOR THE TRAINING OF  
ENVIRONMENTAL HEALTH TECHNICIANS  
IN ANGLOPHONE MEMBER STATES**



## **ABBREVIATIONS**

WAHO	West Africa Health Organization
EHIA	Environmental Health Impact Assessment
BSc	Bachelor of Science
BEHS	Bachelor of Environmental Health Science
WASH	Water Sanitation and Hygiene
GCE	General Certificate in Education
RAM	Random Access Memory
ROM	Read Only Memory
CLTS	Community Led Total Sanitation
IEC	Information, Education and Communication
MDG	Millennium Development Goals
WSSD	World Summit on Sustainable Development
NEPAD	New Partnership for Africa Development
GIS	Geographical Information System
EIA	Environmental Impact Assessment
SPSS	Statistical Product and Service Solution
HIV	Human Immuno- deficiency Virus
PHC	Primary Health Care
SWOT	Strengths, Weaknesses, Opportunities and Threats
EHIS	Environmental Health Information System
AFP	Alpha-Feto Protein
CVS	Chorionic Villus Sampling
PUBS	Percutaneous Umbilical Blood Sampling
NST	Non-Stress Test
MRI	Magnetic Resonance Imaging
IDRS	Integrated Disease Surveillance and Response



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## **1.0 AIMS AND OBJECTIVES:**

### **1.1 AIM**

To train competent Environmental Health Technicians who will complement Environmental Health Officers in the day to day management of the environment.

### **1.2 OBJECTIVES OF THE PROGRAMME**

The training will develop the cognitive, affective and psychomotor domains of the Environmental Health Technicians.

**The cognitive objectives include that the technicians should be able to:**

- i. Identify hazards associated with each environment;
- ii. Identify the factors for quantifying the level of risks associated with each hazard;
- iii. Determine measures to mitigate and control the risks identified, and;
- iv. Explain global environmental challenges and their impact on the local environment

The affective objectives include that the technicians should be able to:

- v. Demonstrate an internal confidence as a sense of self actualization and ability to complement Environmental Health Officers
- vi. Relate appropriately and effectively with the public and other professionals in the management of the environment
- vii. Motivate community members to take positive health actions

The psychomotor objectives are to enable the technicians to be able to:

- viii. Apply appropriate scientific techniques to mitigate the risks identified
- ix. Guide trainees on the field appreciation of environmental conditions
- x. Assess environmental situations to determine their impact on human health

## **2.0 NATURE OF THE PROGRAMME**

The curriculum contains environmental health courses which are appropriate to the Environmental Health Technicians' routine responsibilities and duties. The programme is structured to be student-centred with full incorporation of on the job training and experiences.

## **3.0 MINIMUM ENTRY REQUIREMENTS**

Candidate wishing to pursue the Environmental Health Technician programme must produce evidence of holding one of the following qualifications. (General Certificate of Education (GCE), the Anglophone West African Secondary School Certificate Examination (WASC) or the Francophone equivalent with minimum of four credit passes at not more than two sittings. The credit passes must include English Language, Mathematics, Chemistry and Biology. Possession of five credit passes is an added advantage.

## **4.0 MINIMUM QUALIFICATION FOR TRAINERS/TUTORS**

The Trainers in addition to professional registration with appropriate regulatory body shall possess a minimum of:

- a. Higher National Diploma (HND) in Environmental Health
- b. Bachelor of Science in Environmental Health
- c. Higher National Diploma (HND) in Environmental Health
- d. Post Graduate Diploma in Environmental Health/Education or equivalent.
- e. Masters or Doctorate degrees.

## **5.0 MINIMUM FACILITIES REQUIRED FOR THE PROGRAMME.**

- (a) At least four Unit class room blocks of capacity for 50 students per class
- (b) Computer Laboratory,
- (c) Environmental Health Laboratory
- (d) General laboratory (Physics; Chemistry and Biology)
- (e) Demonstration Rooms/Museums
- (f) Demonstration Ground
- (g) Library containing E- Library section / Internet Connection.
- (h) Adequate means of Transport
- (i) Source of regular Potable Water Supply
- (j) Source of regular Electricity Supply
- (k) Adequate Hostel Accommodation
- (l) Recreational Facilities
- (m) Environmental Sanitation /Demonstration Village.
- (n) Adequate Security

## **6.0 EMPLOYMENT OPPORTUNITIES:**

- a) Ministries of Environment ( Federal / States)
- b) Ministries of Health (Federal / States)
- c) Ministries of Culture and Tourism ( Federal / States)
- d) Ministries Agriculture, and Rural Development (Federal /States)
- e) Ministries of Water Resources (Federal / States)
- f) Port Health Authority
- g) Local Government/ Rural Development Authority
- h) Tertiary/Secondary health Institutions
- i) Educational institutions
- j) Oil and Gas Industries.
- k) Petro Chemical Industries
- l) Private Sector (Environmental Health Service companies)
- m) Food Processing Industries
- n) Mining Industries.
- o) NGOs in Water, Sanitation And Hygiene (WASH)
- p) Hospitality Industries such as Hotels, Parks etc
- q) Military and Paramilitary services
- r) Environmental sanitation/ waste management Agencies
- s) Entrepreneurship opportunities

## **7.0 ENTRY POINT INTO PUBLIC AND PRIVATE SERVICES:**

This is dependent on each Member State's entry point for Technician Cadre into the Service.

## **8.0 LEVEL OF INVOLVEMENT OF OTHER STAKEHOLDERS OR PROFESSIONALS IN TRAINING**

The following under listed stakeholders may be involved in the training by providing support in the area of materials, funds and manpower.

- a) Governments
- b) Communities
- c) Students Associations
- d) Alumni Associations

- e) Professional Association
- f) NGOs/ Charity organisations
- g) Regulatory Body
- h) International Organisations and
- i) Any other stakeholders

## **9.0 PROGRAMME DESCRIPTION**

The programme shall last three years or six semesters of class room and field training. Each semester of the programme will last for a minimum of 16 weeks class work, maximum of six weeks holidays, and 14 weeks for continued field practice. Each course is sub-divided into units. One credit unit represents teacher - student contact hours of one hour per week per lecture and tutorial and two to three hours per week for practical and laboratory work (where applicable).

## **10.0 TEACHING AND LEARNING METHODS**

The programme emphasises student's development of practical skills hence the need for mastery learning strategies in teaching. However, group discussions, seminars, role plays, laboratory investigations, assignments, demonstrations, field trips, and projects will contribute effectively to the development of essential skills needed by the Environmental Health Technicians.

## **11.0 REGISTRATION OF STUDENTS WITH THE REGULATORY BODIES**

The department running the EHT programme is expected to register the students within the first year of admission with the countries' regulatory body. *This is for the purpose of indexing.* The registration is recognized as the effective date of commencement of the course and it also determines when the student is due for the first and final Council Professional Examinations, bearing in mind that the student must have fulfilled the Institution requirements to proceed to 300 levels. Registration with the regulatory bodies entails:-

- (vii) Completion of a Student Registration Enrolment Form which must be endorsed by the Head of Department who should be registered with the regulatory body.
- (viii) Payment of prescribed fees
- (ix) Presentation and screening of credential for eligibility
- (x) Eligible students are then enrolled as Environmental Health student with student registration number
- (xi) Students enrolment letters are sent through the Head of Department
- (xii) Students who fail the eligibility screening would be advised to withdraw from the programme forthwith until the requirements are met for the programme.

## **12.0 REQUIREMENTS FOR GRADUATION**

A candidate must have made a minimum of 75% class room attendance and practical / field work in approved training institution. Candidate must also have passed each of the unit courses at not less than 40% in all the examinations conducted during the training programme. A candidate who fails the final examination after three attempts shall be withdrawn from the programme.

Evaluation shall be based on coursework assessment and terminal examination for each course. The coursework assessment shall make up 30% while the final course examination will be 70% to make up the maximum of 100%.

**13.0 GRADING**

SN	Percentage Score	Letter Grade	Grade Point
1	75% - 100%	A	3.5 - 4.0
2	70% - 74%	B	3.0 - 3.49
3	60% - 69%	C	2.5 - 2.99
4	50% - 59%	D	2.0 - 2.49
5	Less than 50%	E	< 2.0

**14.0 CLASSIFICATION OF CERTIFICATE**

GPA	Class of Diploma
3.5 – 4.0	Distinction
3.0 – 3.49	Upper Credit
2.5– 2.99	Lower Credit
2.0 – 2.49	Pass
0.00-1.99	Fail

## **PROGRAMME STRUCTURE**

### **YEAR 1- FIRST SEMESTER**

<b>Course Code</b>	<b>Course Title</b>	<b>Hours</b>	<b>Theory</b>	<b>Practical</b>	<b>Units</b>
GNS 101	Use of English/ French/ Portuguese	30	2	0	2
CHEM 101	General Chemistry	30	1	1	2
EHT 101	Introduction to Environmental Health	45	2	1	3
MTH 101	General Mathematics	30	2	0	2
PHY 101	General Physics	30	1	1	2
MCB 101	Introduction to Microbiology	30	1	1	2
EHT 103	Human Anatomy and Physiology I	45	2	1	3
EHT 105	Sociology and Anthropology	30	2	0	2
CSC 101	Introduction to ICT	30	2	0	2
GNS 103	Use of Library	30	1	1	2
GNS 104	Citizenship Education	30	2	0	2
<b>Total</b>		<b>360</b>	<b>18</b>	<b>6</b>	<b>24</b>

### **YEAR 1- SECOND SEMESTER**

<b>Course Code</b>	<b>Course Title</b>	<b>Hours</b>	<b>Theory</b>	<b>Practical</b>	<b>Units</b>
EHT 122	Technical Drawing Skills	30	1	1	2
CSC 102	Computer Applications	30	0	2	2
EHT 124	Primary Health care	30	1	1	2
EHT 104	Human Anatomy and Physiology II	45	2	1	3
EHT 106	First Aid & Medical Emergencies	30	1	1	2
EHT 126	Introduction to Building Sanitation	30	1	1	2
EHT 128	Medical Entomology	30	1	1	2
MLT 138	General Laboratory Techniques	45	2	1	3
EHT 130	Public Health Immunology	30	1	1	2
EHT 132	Introduction to Pollution Control	30	2	0	2
EHT 108	Biomedical & Health Care Waste	30	1	1	2
<b>Total</b>		<b>360</b>	<b>13</b>	<b>11</b>	<b>24</b>

**YEAR 2 - FIRST SEMESTER**

Course Code	Course Title	Hours	Theory	Practical	Units
EHT 211	Technical Report writing in Environmental Health	30	1	1	2
EHT 213	Environmental Health Practice I				2
EHT 215	Water supply and treatment Technology	30	1	1	2
EHT 217	Abattoir & slaughter slab management	30	1	1	2
EHT 219	Waste Management	45	2	1	3
EHT 221	Environmental Health Laws and Court procedures	45	1	2	3
EHT 223	Sanitary Inspection of Premises	45	2	1	3
EHT 225	Food Hygiene and Safety	30	1	2	3
<b>Total</b>					<b>20</b>

**YEAR 2 – SECOND SEMESTER**

Course Code	Course Title	Hours	Theory	Practical	Units
EHT 222	Log Book Assessment	90	0	6	6
<b>Total</b>		<b>90</b>	<b>0</b>	<b>6</b>	<b>6</b>

**Note: Year two second semester is for practical/ Field attachment.**

**AREAS TO BE COVERED DURING PRACTICALS/ FIELD WORK INCLUDE:**

1. Sources of Water Supply (Rural/Municipal)
2. Water Treatment plant
3. Environmental Health Offices
4. Epidemiological units
5. Sanitation Courts
6. Laboratories
7. Abattoir
8. Food Processing Establishments
9. Waste Management Agencies
10. Public/Private Mortuaries
11. Sanitation units of Hospitals
12. Biomedical Wastes Management Agencies
13. Quarries and Mines
14. Port Health Services
15. Irrigation schemes
16. Other relevant units

**Each student is expected to keep a log book to be submitted for assessment**

**YEAR 3 FIRST SEMESTER**

<b>Course Code</b>	<b>Course Title</b>	<b>Hours</b>	<b>Theory</b>	<b>Practical</b>	<b>Units</b>
EHT 311	Non Communicable Diseases Control	30	1	1	2
EHT 313	Occupational Health and safety	30	2	0	2
EHT 315	Introduction to Health Education and promotion	30	2	0	2
EHT 317	Research methodology	30	2	0	2
EHT 319	Ethics and codes of practice	15	1	0	1
EHT 321	Pesticides and Formulations	30	1	1	2
EHT 323	Instrumentation and maintenance	30	1	1	2
PHT 310	Introduction to Pharmacology	30	2	0	2
EHT 325	Health Statistics	30	2	0	2
EHT 327	Environmental Health Practice II				2
<b>TOTAL</b>		<b>255</b>	<b>14</b>	<b>3</b>	<b>19</b>

**YEAR 3 SECOND SEMESTER**

<b>Course Code</b>	<b>Course Title</b>	<b>Hours</b>	<b>Theory</b>	<b>Practical</b>	<b>Units</b>
EHT 322	Research project	45	1	2	3
EHT 324	Contemporary Issues in Environmental Health	30	2	0	2
EHT 326	Epidemiology and communicable disease control	30	2	0	2
EHT 328	Entrepreneurial Skills in Environmental Health	30	2	0	2
EHT 330	International/ Port Health Services	30	2	0	2
EHT 332	Demography in Environmental Health	15	2	0	2
EHT 334	Introduction to Health Administration and Management	15	2	0	2
EHT 336	Techniques in Disaster Management	30	1	1	2
<b>Total</b>		<b>225</b>	<b>14</b>	<b>3</b>	<b>17</b>



## **DESCRIPTION OF COURSES**

### **GNS 101: Use of English /Functional French and Portuguese**

Objectives: The students from English speaking countries must be taught basic functional French that would enable them speak, read, write and interact with people across borders or with people from other language background. This will promote the spirit of integration and fulfil the primary aim of harmonization and mobility of health professionals within the region. The content should be according to the approved content of relevant department of the domicile Institution.

### **CHEM 101: General Chemistry**

Describe, select and apply basic measurements and conversions. Describe basic principles of chemistry. Describe chemistry of air, water, soil and food. Describe the movement, storage and cycling of chemicals in the environment. Describe the impact of chemical pollution on the environment and health. Describe chemical occupational and environmental hazards. Describe the properties of building materials. Identify the advantages and limitations of instruments used for the analysis of samples which includes: Mass spectrometry, Gas Chromatography, Atomic Absorption Spectrometry, High Pressure Liquid Chromatography. Explain the principles of detergents and disinfectants. Identify physical and chemical hazards. Identify the key food groups. Describe the key principles of food chemistry. Select and apply standard methods to assess the chemical composition of foods.

### **EHT 101: Introduction to Environmental Health**

Definition, history and components of environmental health. Relationship between health and environment. Determinants of ill health status in the environment. Effects of environmental factors such as water, air, noise, biological, socio-cultural and socio-economic, on the health of the community, method of assessing these factors and steps taken to improve on the quality of the environment. Concepts of occupational health and safety. Principles and components of occupational health, various hazards in the occupational environment. Common occupational diseases and their prevention, appropriate hazard control measures in the work environment. Characteristics of environmental health practice. Environmental health practice in the implementation, regulation and enforcement of environmental health functions at different settings (home, schools, market places, recreational and hospitality facilities, workplace, industries; Development projects etc. Tools of environmental health practice, method of assessment of environmental health practice, skills of environmental health practitioners, roles of environmental health officers and regulators. Ethics in environmental health practice. Inter and intra sectoral collaboration in environmental health practice. Carrying out a walk through inspection of an industry. Management of clinic or hospital environment.

### **MTH: 101 General Mathematics**

Apply working knowledge of the following areas: conversions, metric system, simple functions and graphs, descriptive statistics, arithmetic and calculus, exponential laws and logarithms. Apply calculus and conversion in air quality and water sampling, dispersion modelling, emission calculations, landfill lifespan and drinking and wastewater capacity calculation. Apply relevant formulae to solve problems related to building and construction. Apply conversion, metric systems, sample functions and graphs. Explain the meaning and importance of health measurement

**PHY 101: General Physics**

Elementary Kinematics and vector algebra. Newton's laws of motion. Static forces acting on a human body. Elasticity and strength of materials. Momentum conservation; application to contusion and fracture during impacts, and to similar medical situations; conservation of energy; the first law of thermodynamics; applications to metabolism and work done by various organs of the body. Angular momentum and torque. Harmonic motion and diffusion. Applications to osmotic pressure and passage of substances through capillary walls. Molecular motion in gases: distribution functions and the Boltzmann principles. Intermolecular collisions and transport processes. Equilibrium in external fields; the centrifuge and measurement of molecular weight. Rectilinear motions: Newton's laws of motion, Gravitation. Satellites and radial escape velocity. Work and energy, friction and viscosity. Orbital motion, moments of inertia and conservation angular momentum and energy of rotation. Simple harmonic motion of simple systems. Simple properties of solids – elasticity, etc. Surface tension and capillary effects.

**MCB 101: Introduction to Microbiology**

Describe the structure and function of potential pathogens in relation to air and water/soil quality. Describe the range of microorganisms found in air, food, water and soil, their origins and mechanism for dispersion / transportation. Describe biological hazards in the workplace. Apply relevant and appropriate microscope techniques for water analysis, occupational health and safety and food safety. Describe the role of micro-organisms in air, food, water and soil in relation to pollution and pollution control. Describe the key terms and principles pertaining to the survival, growth and destruction of microorganisms. Describe methods to limit the growth of microorganisms in food.

**EHT 103: Human Anatomy & Physiology I**

Describe the normal human structure and function in a health context. Describe the Human anatomy and physiology. Describe and communicate the structure and function of selected body and plant systems. Describe the circulatory, nervous, respiratory, endocrine, digestive and urinary systems in relation to the impact of exposure and health effects of chemical, biological, physical and psychosocial stressors. Explain the principles of biological monitoring.

**EHT 105: Sociology & Anthropology**

Describe the basic social and psychological principles regarding public participation and consultation processes. Describe and communicate human behaviour in terms of specific aspects of environmental health (environmental psychology e.g. stresses, emotions etc). Describe and evaluate world views on culture regarding health promotion. Describe the importance of indigenous knowledge systems. Apply knowledge and discuss social groups and group dynamics (e.g. ethnocentrism). Describe the importance of culture and socialization in environmental health. Describe human development through their lifespan. Relate social impacts to the environmental impact assessment process. Describe the social aspects of environmental planning. Describe the role of environmental health in relation to social wellbeing. Describe the social, biological, chemical, build environment in relation to human health. Identify and explain inequalities in health.

**CSC 101: Introduction to Information Communication Technology I**

Concept and scope of information technology, Computers for information storage, information seeking, information processing and information transmission. Elements of computer system, computer hardware and software; numeric data, alpha numeric data; contents of a program and processing. Computer organization, block diagram of a computer, CPU, memory. Input devices; keyboard, mouse etc; output devices; VDU and Printer, Scanner and Plotter. Electrical requirements, inter-connections between units, connectors and cables. Secondary storage; magnetic disks – tracks and sectors, optical disk (CD and DVD Memory), primary and secondary memory: RAM, ROM, PROM etc. Capacity; device controllers, serial port, parallel port, system bus. Exercises on file opening and closing; memory management; device management and input – output (I/O) management with respect of windows. Installation concept and precautions to be observed while installing the system and software. Introduction to Operating Systems such as MS-DOS and Windows. Special features, various commands of MS word and MS-Excel. About the internet – server types, connectivity (TCP/IP, shell); applications of internet like: e-mail and browsing. Various Browsers like WWW (World Wide Web); hyperlinks; HTTP (Hyper Text Transfer Protocol); FTP (File Transfer Protocol). Basics of Networking – LAN, WAN and Topologies.

**GNS 103: Use of Library**

Basic concepts of library science, types of library and forms of library services. Cataloguing and book classification schemes. Use of library in research. Qualities of a good library. Essential components of a good library. Library and ethics. E-library etc.

**GNS 104: Citizenship Education**

Basic concepts, principles and provision of the country constitution. The national system of government in the country, the constitutional rights and obligations of citizens, meaning of citizenship, the fundamental objectives and principles of national policy of the country. Explain the term constitution, the different types of constitution, discuss the merits and demerits of types of constitution, outline some provisions of international constitution, explain the importance of international constitution, and recognize the supremacy of the national constitution over other local or national laws, process of drafting a constitution, explain the concept 'rule of law and separation of powers. Describe the structure and functions of different tiers of government in your country. Explain how revenue and resources are generated and applied by different tiers of government of your country. State the significant of right and obligation of citizens to the development of your country as well as the fundamental rights of citizen.

**EHT 122 Technical Drawing Skills**

The course is to enable students understand the basic drafting procedure on a piece of paper or other material, on a smooth surface with right-angle corners and straight sides or typically a drawing board. Understand the meaning of technical drawings as well as two-dimensional and three-dimensional representations. Understand computer based technical drawing. Understand simple sketch and be able to draw and interpret simple engineering or graphic designs of building appurtenances, septic and sewage design systems and understand the connectivity of how the designs works with an effective sewage control system in a building or the larger municipal sewage systems.

**CSC 102: Computer Applications (Practical)**

Identification of various parts of a computer and peripherals. Practice in installing a computer system by giving connection and loading the system software and application software on entering text and data (Typing Practice). Installation of Windows 98 or 2000 etc. Features of Windows as an operating system: Start, Shutdown and restore, Creating and operating on the icons, Opening closing and sizing the windows, Using elementary job commands like – creating, saving, modifying, renaming, finding and deleting a file, Creating and operating on a folder, Changing settings like, date, time, colour (back ground and fore ground), Using short cuts, Using on line help.

MS-WORD: File Management: Opening, creating and saving a document, locating files, copying contents in some different file(s), protecting files, Giving password protection for a file, Page Set up: Setting margins, tab setting, ruler, indenting, Editing a document: Entering text, Cut, copy, paste using tool-bars, Formatting a document: Using different fonts, changing font size and colour, changing the appearance through bold/ italic/ underlined, highlighting a text, changing case, using subscript and superscript, using different underline methods: Aligning of text in a document, justification of document ,Inserting bullets and numbering, Formatting paragraph, inserting page breaks and column breaks. Use of headers, footers: Inserting footnote, end note, use of comments, Inserting date, time, special symbols, importing graphic images, drawing tools, Tables and Borders. Creating a table, formatting cells, use of different border styles, shading in tables, merging of cells, and partition of cells, inserting and deleting a row in a table. Statistical analysis of data.

**EHT 124: Primary Health Care**

This course is designed to provide the student with the necessary knowledge and skills needed to understand the basic principles of Primary Health Care and its components in the National Health Policy. Define Health, define Primary Health Care and explain the principles of PHC. Explain the Components of PHC; describe the history of health services in the country. Define Health Team, List members of a health team, enumerate the functions of a health team, enumerate the advantages of a health team, and identify the problems that can militate against a Health Team. Define culture, explain the role of culture in Health, and describe the socio-economic factors affecting Health. Enumerate the environmental factors that can affect health positively or negatively. Outline the personal factors that can promote or inhibit the Health of man. Identify PHC as the basis for the National Health Policy. State the rationale for National Health Policy. Development of health system, concept and principles of primary health care services. Components of PHC. Structures and organogramme. Elements of PHC, Oral re-hydration therapy, screening, disease surveillance, immunization techniques, cold chain technology, Essential drugs: drug revolving fund, Control of common endemic diseases, reproductive health, maternal and child health etc. Resources for PHC delivery, SWOT Analysis of PHC. Participatory techniques in PHC delivery. Maternal and Child survival strategies etc

**EHT 104: Human Anatomy & Physiology II**

Introduction and History of Physiology. Structure and function of cell membranes with emphasis on transport across cell membrane. Biophysical principles. Osmosis, diffusion, active transport. Homeostasis and control systems. Body fluid compartments, blood formation, functions, Haemostasis, haemorrhage, Electrophysiology of the heart, cardiac cycle, venous return, circulatory adjustment to exercise, physiology of respiration. Systemic or greater circulation, pulmonary or lesser circulation. The Heart, Chambers, Capacity, Heart walls: Epicardium, Myocardium, Endocardium and pericardium. Heart valves: atrioventricular and semilunar, Cardiac cycle and phases: systolic (contract) and diastolic

(relaxation) Mechanism of valve functioning physiological properties of cardiac muscle. The basis of heart Automaticity (a) Sinoatrial node (paced maker) (b) Atrioventricular node (c) The Bundle of Hiss, Stanius experiment Heart Block, fibrillation, Refractory period of the cardiac muscle: Extra systole External manifestations of cardiac Activity: Apex beat, Heart Sounds, Bioelectrical activity of the heart and its recording: standard leads (ECG) chest leads, Control of cardiac Activity Nervous control.

Reflex control: Intracardiac reflex responses – Reflex effects of the pericardium, reflex effects of the coronary pulmonary, atria and ventricular vessels, Effects of vascular reflexogenic zones, Reflex effects of visceral receptors. Effects of the cerebral cortex on cardiac Activity. Humoral control of Cardiac Activity, effects of electrolytes:  $K^+$  &  $Ca^{2+}$  ions, effects of neurotransmitters, effects of hormones: Thyroxine, insulin, Gonadal hormones, Adrenaline and nor adrenaline. Heart Rate balance, Adaptation to abnormal environments, metabolic rate and temperature regulation.

### **EHS 106: First Aid and Medical Emergencies**

Basic Skills for First Aid and safety measures for sudden illnesses and injuries in the home, playground, workplace and public places. Management of emergency conditions due to falls, cuts and abrasions, drowning, burns, electric shocks, etc. Skills in cardiopulmonary resuscitation; mouth-to-mouth resuscitation; overview of first aid and emergency care, haemorrhage, epistaxis and haemoptysis, malaena, haematuria and wounds, shock, burns and scalds, fracture, dislocation and strains, artificial respiration, first aid box & ambulance, treatment of pesticide and food poisoning, common conditions requiring first aid attention.

### **EHT 126: Introduction to Building Sanitation**

Explain the relationship between housing and health. Describe the role of an EHP in housing. Explain the concept of low cost housing. Interpretation of building plans. Identify and describe the specialised requirements for places of residence. Develop and communicate IEC (Information Education and Communication) messages pertaining to good housing. Assess risks to health from the built environment. Analyse information from a risk assessment of housing. Apply effective interventions for better housing. Investigate and report on state of housing as stipulated by the relevant legislation and regulations. Identify the advantages and disadvantages of different construction materials. Identify and explain the different types of loads on a building structure. Apply relevant building and engineering mathematics. Design concept, simple beams, columns, slabs and foundations. Describe the suitability of a site on which to construct a standard building. Describe the necessary site development work to allow for drainage, levelling, orientation, entrances, surface water disposal, siting of septic tank. Determine stresses and strains of construction materials. Assess the appropriateness of building services (e.g. water supply, heating systems, domestic electrical and fire protection services. Apply and critically evaluate the key principles of building construction. Apply and evaluate the fundamentals of environmental sciences to the assessment of human comfort factors, humidity, condensation, lighting and ventilation associated with alternative forms of building construction.

**EHT 128: Medical Entomology**

Definition of pest/vector of public health importance. Identify vector taxonomies and biology with examples. Comparing the improvement of methods of vector/pest control e.g. biological, physical, chemical, genetic and Environmental control measures. Examples of chemical used in Public health pest control. Health implications of some chemicals used in pest control Revenue generation from public health Pest Control Services. Fumigation, indoor spraying of commercial and residential premises

**MLT 138: General Laboratory Techniques**

Define the terms in laboratory services. Concept and purpose of diagnostic skills. Procedure for proper collection of specimen (blood, urine, stool, swaps, sputum etc). Explain the use of appropriate media and containers to transport specimens to appropriate laboratory when necessary. Perform relevant laboratory procedures e.g. Urinalysis, haemoglobin estimation, stool examination, tuberculin test, etc. Record laboratory result and file appropriately. Obtain supplies for the laboratory. Maintain the laboratory equipment and space. Explain how to prevent fire and accident in the laboratory. Discuss basic universal precautions in the laboratory.

**EHT 130: Public Health Immunology**

Fundamental principles of immunology with emphasis on the nature of antibodies and antigens, blood groups, antigen-antibody reactions, hypersensitivity, types of immunity and factors affecting immunity, vaccines and vaccination, serological vaccine efficacy and coverage surveys. Principles of immunization; Immunizable diseases, immunization techniques and schedules, cold-chain management, and vaccine development technologies, immunological techniques, adverse reaction etc.

**EHT 132: Introduction to Pollution Control**

Definition of pollution and pollutants. Differentiate between pollution & contamination. Sources of Environmental pollutants. Identify specific indicators of pollution in an environment. Discuss the Impact of pollution on the health of man and his immediate environment. Describe how to contain specific pollutants and contaminants of environmental health media.

**EHS 108: Biomedical and Health Care Wastes**

Definition and classification of biomedical and health care waste. Sources and health impacts of biomedical and health care waste. Planning in biomedical and health care waste management, handling and transportation of biomedical and health care waste. Waste minimization, recycling, and reuse. The role of legislation in biomedical and health care waste, treatment technologies for biomedical and health care waste. Disposal methods in biomedical and health care waste. Health and safety rules for personnel and associated workers. Infection control and emergency response, training and retraining in biomedical and health care waste.

**EHT 211: Technical Report Writing in Environmental Health**

This course deals with the writing of technical and professional reports after carrying out an inspection visit to residential or other regulated premises or after carrying out any environmental health activities or functions. Students should understand how to start the inspection of premises from the outside, rear, inside or passages, sanitary conveniences, outhouses, cloakrooms etc. and be able to report such in writing as well as ability to draw the sketch plan or graphic dimension of such premises within a stipulated period in the class after

returning from practical inspection of such premises. Subject teachers in conjunction with the authorities of the institution should facilitate such practical visits.

### **EHT 213 Environmental Health Practice I**

Courses to be examined under practice one include , introduction to primary health care, water supply and treatment technology, medical entomology, abattoir and slaughter slab management, waste management, environmental health law and court procedures, sanitary inspection of premises food hygiene and safety and technical report writing in environmental health. The structure of the examination shall be multi-choice (objective) questions (40marks) and practical examination (60marks).

### **EHT 215: Water Supply and Treatment Technology**

Explain the meaning of water and water sanitation. Sources of water supply, characteristics of water supply sources. Describe the parameters that would enable an Environmental Health Professional determine the quality of drinking water. Describe the acceptable standard for drinking water quality. Explain how water can be contaminated. State the epidemiology of water borne and water related diseases. Describe the stages in water purification in a water production facility, processes of water treatment and purification including monitoring and surveillance of water quality.

### **EHT 217 Abattoir and Slaughter Slab Management**

Describe the role and function of other agencies involved with meat inspection, slaughter management and food animal husbandry and welfare. Describe the principles of good practice in an abattoir. Describe and apply abattoir planning, construction and management in terms of standard regulations and guidelines. Explain and recognise the requirements and needs for food animal husbandry. Apply the principles of risk assessment to meat inspection and slaughter management. Practical training in meat inspection at an abattoir. Identify factors in abattoir practice and legislation that determine the hygiene and quality of meat. Perform, recognise and describe hygiene and procedures involving food animal slaughter in line with regulations.

### **EHT 219: Waste Management**

Definition and classification of waste. Characteristics of waste. Method of solid waste disposal with particular reference to Incineration and land fill disposal. Health care waste management. New concepts in solid waste management. i.e. Duty of care, re-use, re-cycle, and recovery. Sewage collection and disposal. Definition of liquid waste. State examples of liquid waste. Identify and explain the components or constituents of liquid waste. Describe the various methods of managing liquid waste. Define special waste and disposal of the dead. Assess facilities for storage and transport of dead bodies. Describe the methods and practices by which an exhumation can be conducted. Describe the management and disposal of unclaimed dead bodies. Identify and describe methods of transportation of corpses under national and international laws. Understand the procedure for cremation of corpse.

### **EHT 221: Environmental Health Laws and Court Procedures**

Define and describe an abatement notice. Define nuisance and give specific examples. Explain the conditions that require the use of abatement notice in abatement of a nuisance. Discuss the process of serving of an Abatement Notice to ensure total compliance. Explain joinder of parties. Explain food and hygiene laws. Explain building sanitation laws. Explain meat sanitation laws. Differentiate between edict, bye-laws and decrees with specific examples of how they are made or use. Differentiate between abatement notice and court

summons. Explain the conditions or situations that call for the issuance of a court summon. Explain the process of serving a court summons. Explain how an Environmental Health Officer prepares a case for prosecution in a court of competent jurisdiction. Explain the following as used in court procedures: a prosecutor, a primary case witness, a defence witness, investigating police officer, a defence counsel, court, mobile courts, magistrate, nuisance order, as court pleases, accuse /witness at large, sin qua non, mutant's mutandis, case struck out, case adjourned, date of re-arraignment, accuse guilty as per charge, allocutor, plea, accuse reprimanded, in-subordination, impersonation etc. Explain the situation under which the following is applied or necessary in the prosecution process: bench warrant, subpoena, contempt of court, nuisance/court order, locus inquo, injunction, exparte-motion, adjournment, submission of facts, examination and cross examination, examination in- chief etc. Explain the use and difference between the following documents in prosecution of environmental health cases: court summons, charge sheet, commitment to jail, prosecution file, bench warrant, certificate of destruction etc.

### **EHT 223: Sanitary Inspection of Premises**

Define and differentiate between an ideal house and premises. The concept and the requirements of an ideal house. Explain the precaution to be taken before the choice of site for housing and construction of a building. Explain the procedures for premises inspection and abatement of nuisances. Enumerate the various policies, regulations and laws covering housing and premises sanitation in the member country. Sanitary Inspection of Premises with a view to issuing Certificate of fitness for Habitation for new buildings and certificate of fitness for Continued Habitation for existing buildings. Appraise the National Environmental Sanitation policy (NESP).

### **EHT 225: Food Hygiene and Safety**

Food chain and food security. Food borne diseases, their epidemiology prevention and control. Licensing of food-preparing and water packaging premises. Licensing Liquor-selling premises. Organization of Workshop programme for food handlers on food safety and hygiene. Describe the general overview of the procedure and process of meat hygiene and inspection. Differentiate between relevant anatomical features of different food animals. Describe the physiological and pathological conditions, disease. Identify, evaluate and communicate (including sampling and analysis). Describe the national and international framework for zoonotic and notifiable diseases and parasitology in bovine, porcine, equine poultry, game and fish. Describe the national and international legal framework for zoonotic and notifiable diseases physiological and pathological conditions, disease and parasitology in bovine, porcine and equine poultry, games and fish. Critically analyse and apply the national and international legal framework for zoonotic and notifiable diseases.



**YEAR TWO SECOND SEMESTER IS FOR PRACTICAL/ FIELD ATTACHMENT.**

**AREAS TO BE COVERED DURING PRACTICALS/ FIELD WORK INCLUDE:**

1. Sources of Water Supply (Rural/Urban)
2. Water Treatment plant
3. Environmental Health Offices
4. Epidemiological units
5. Sanitation Courts
6. Laboratories
7. Abattoir
8. Food Processing Establishments
9. Waste Management Agencies
10. Public/Private Mortuaries
11. Sanitation units of Hospitals
12. Biomedical Wastes Mgt Agencies
13. Quarries and Mines
14. Port Health Services
15. Irrigation schemes
16. Other relevant units

**EHT 311: Non-Communicable Diseases**

Concept of disease, aetiology, epidemiology and predisposing factors, clinical signs and symptoms of non-communicable diseases. preventive measures of non-communicable diseases. Principles of control of non-communicable diseases. Identification of pandemic emerging and re-emerging non-communicable diseases. Specific examples of common non-communicable diseases in sub-Saharan Africa. Role of the individual, family, community, government and international institutions in the control of non-communicable diseases.

**EHT 313: Occupational Health And Safety**

Definition, scope and evolution. Principles and practice of occupational health and industrial hygiene; work environment and productivity; proxemics and ergonomics; basic occupational health team; worksite wellness promotion programs. Common occupational health problems in industries, agricultural establishments; health care establishments; construction settings. Occupational health policies, regulations and regulatory Agencies. Environmental and occupational hazards, evaluation and measurement of exposure levels. Occupational stress, identification of the role of human and environmental factors in occupational hazards. Methods of prevention and control. Safety procedure in different occupational and safety management.

**EHT 315: Introduction to Health Education and Promotion**

Understand relevant definitions in health education and health promotion. Explain the concepts of health communication, promotion, advocacy and education. Describe the principles of health communication, promotion, education and advocacy. Evaluate and critically analyse national and international policies for health care delivery. Critically analyse and apply health communication, advocacy and promotion models. Execute a situation or needs analysis to determine health communication, advocacy and promotion requirements. Evaluate and analyse the national and international policies on environmental protection and sustainability. Understand Communication (IEC) strategies in health education. Demonstrate an effective use of participatory methods of working with communities.

**EHT 317: Research Methodology**

Research Methodology, Qualitative and Quantitative data Samples and sampling methods, types of data and sample size determination. Type and design of questionnaire, focus Group Discussion, Key informant interviews, Environmental Sampling, data collection. Data analysis including use of computer based analytical packages e.g. SPSS, EPI-INFO etc. Proposal and report writing: Topic selection, justification, objectives, literature search, methodology, results and discussion. Referencing, Appendices etc.

**EHT 319: Ethics & Code of Practice**

The need for training and admission of the Sub-Professional cadre and their relevance to the Profession of Environmental Health. Professional ethics required from the Sub-professional cadre e.g. comportment, morals, attitude to the public, dressing/uniform, courtesy to senior colleague, attitude to work. Ethics of environmental health profession with particular reference to registration, license and attendance of continuous education Programme as well as avoidance of negative behaviours (vices) e.g. lateness to work, absenteeism, and drunkenness during official hours, pranks, corruption, compromise of professional responsibilities etc.

**EHT 321: Pesticides and Formulations**

Definition and sources of pesticides/chemicals used in public health, types and formulations, routes of exposure to chemicals, adverse effects of pesticides/chemicals on human health. Assessment of human health risk exposed to pesticides/chemicals, environmental effects of chemicals/pesticides. Groups and modes of actions of pesticides/chemicals, management of toxic chemicals, personal protection, environmental protection, first aid for pesticides poisoning and medical treatment of pesticides.

**EHT 323: Instrumentation and Equipment Maintenance**

Define the use, application and maintenance of equipment such as plume imaging, optical air monitoring, air sampling, ozone monitor, barometer, dissolve oxygen meter, sound level meter, nitrogen dioxide monitor, particulate separator water sampler etc., IEC equipment such as camera, projector, video camera etc., pressurised sprayer, knapsack sprayer, motorised sprayer, aerosol applicator etc.

**PHT 329: Introductory Pharmacology**

Definition and concept of pharmacology; Divisions of pharmacology and their applications; Terminologies and abbreviation; Types and nature of drugs; Pharmacodynamics; Pharmacokinetics; classification of drugs and their importance; controlled drugs, drug use, abuse and addiction; Self medication; introduction to chemical toxicology; General principles of management of poisons.

**EHT 325: Health Statistics**

Definitions in health statistics. Sources of health and biostatistics. Importance of Health Statistic. Apply general principles of statistics within the health service management systems. Develop tools for data collection. Review scientific research reports in Environmental Health. Conduct community needs assessment and present it to relevant stakeholders. Descriptive statistics, Measures of dispersion etc.

**EHT 327: Environmental Health Practice II**

Courses to be examined under practice two include; introduction to pollution control, public health immunology, control of non-communicable diseases, occupational health and safety, introduction to health education and promotion, ethics and code of practice, pesticide and formulations, instrumentation and equipment maintenance and health statistics. The structure of the examination shall be multi-choice (objective) questions (40marks), alternative to practical (20 marks) and oral examination (40 marks).

**EHT: 322 Research Project**

Students are guided in the development, execution and writing of their research project in the approved area of their interest. They are also expected to present a simple seminar before the approval of their chosen topic.

**EHT 324: Contemporary Issues in Environmental Health**

Concept of Environmental Impact Assessment. Procedure and steps involved in Environmental Impact Assessment. Stakeholders involved in Environmental Impact Assessment. Define and explain Environmental Health Impact Assessment. Relationship between Environmental Impact Assessment and Environmental Health Impact Assessment. Roles of Environmental Health professionals in Environmental Health Impact Assessment. Climate change, concept of climate change, weather, greenhouse gases, ozone, ozone depletion, Acid rain, effects of climate change, green house gases and ozone depletion, challenges and problems of climate change, diseases associated with climate change etc. Describe the principles of ecology and geology and communicate in relation to human health and sustainable development. Explain the environment as a complex of interacting biophysical, social, economic and political systems. Explain basic soil science in relation to migration of ground water and permeability of pollutants into various soil types. Explain the applicable building materials and methods. Explain the mechanics related to soil structures. Describe the principles of ecology and geology and it's relation to the food chain and food security.

**EHT 326: Epidemiology and Communicable Disease Control**

Identify communicable diseases and their modes of transmission. Describe the pathogenesis of various micro-organisms. Identify risk groups. Explain emerging, re-emerging and neglected tropical diseases. Implement control programmes for communicable diseases. Monitor and evaluate the toxicological aspects of communicable diseases. Describe terms and definitions relevant to the investigation of food poisoning and disease outbreaks. Critically analyse case control studies of communicable diseases. Management and control of outbreaks associated with recreational (indoor and surface) waters. Fundamental principles of immunology with emphasis on the nature of antibodies and antigens, blood groups, antigen-antibody reactions, hypersensitivity, types of immunity, vaccines and vaccination, serological vaccine efficacy and coverage surveys. Principles of immunization. Immunizable diseases, immunization techniques and schedules, cold-chain management, and vaccine development technologies, immunological techniques, adverse reaction etc. Define epidemiology and types

of epidemiology. Principles of epidemiology. Describe causes of diseases and how diseases are classified and their mode of transmission. Analyse, interpret and present basic statistical information. Identify and apply appropriate study designs used in disease surveillance. Apply the five levels of prevention to combat communicable diseases. Collect, analyse and interpret information and disseminate findings to all relevant stakeholders.

### **EHT 328: Entrepreneurial Skills**

This course will enable students to acquire knowledge of relevant business skills. Recognition of opportunities, generating ideas / creativity, risk taking, critical thinking, analysis of new initiatives, corporate finance, family business ownership and wealth management, capital, organizational effectiveness, mergers and acquisitions, organizational design, sales management, consumer behaviour, research and marketing strategy

### **EHT 330: International/Port Health Services**

Definition of Port health services. Roles of Environmental Health professionals in port health. Terminologies used in port health services. How to carry out environmental health duties at airports and seaports. Cross-boundary port health services. International organizations and agencies and non-governmental organizations (NGOs). Constitutions, conventions, treaties, international regulations and agreements. Roles of international organizations in port health. International collaboration and cooperation in port health.

### **EHT 332 Demography in Environmental Health**

Demography: definition and concepts. Introduction to the principles and methods of demography. Sources of population data; Population structure and characteristics, population dynamics and health implications, population structure and population movement. Census: types, methods, principles and practice. Applications of census data. Population data and the planning of social services. Demographic transitions and health/disease patterns and services. Indices of population, health and development, life table techniques and interpretation of related indices. Determinants of population growth and distribution, Sources of demographic data, Effects of population structure on health, vital registration systems, Measures of mortality, Differentials in mortality, Migration, National population policy. Define the concepts of population, health and development. Explain different demographic techniques and their interpretation. Describe health interventions applicable to different population groups. Identify, analyse and develop measures to address gender equality in communities. Apply ethical issues in different cultures in population health research. Execute public, behavioural and health service interventions.

### **EHT 334: Introduction to Health Administration and Management**

Concepts, theories and application in Environmental health. Institutional arrangement, staffing and funding. Guidelines in environmental health administration. Supervision and monitoring, quality assurance, equity, cost controls, organizing, inter and intra sectoral collaboration. Budgeting, work plan and programme development, implementation, monitoring and evaluation.

### **EHT 336: Techniques in Disaster Management**

Define concepts and definitions in disaster management. Outline the role of environmental health professional in disaster management. Develop measures to manage an emergency situation. Develop and execute plans for disaster prevention. Critically evaluate emergency support services. Network with stakeholders in disaster manage



**CURRICULUM HARMONISE DE FORMATION EN**  
**LICENCE DE SANTE ENVIRONNEMENTALE**  
**POUR LA FORMATION**  
**DES CADRES DE LA SANTÉ ENVIRONNEMENTALE**



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## SIGLES ET ACRONYMES

<b>AMS</b>	: Assemblée des Ministres de la Santé
<b>BAC</b>	: Baccalauréat
<b>BEPC</b>	: Brevet d'Etudes du Premier Cycle
<b>CEDEAO</b>	: Communauté Economique des Etats de l'Afrique de l'Ouest
<b>CSE</b>	: Cadre de Santé Environnementale
<b>EIE</b>	: Evaluation de l'Impact Environnemental
<b>SGI</b>	: Système de Gestion des Informations
<b>IEC</b>	: Information Education et Communication
<b>NPAD</b>	: Nouveau Partenariat pour le Développement Africain
<b>SST</b>	: Service de Santé au Travail
<b>OIN</b>	: Organisation Internationale de la Normalisation
<b>OMD</b>	: Objectifs du Millénaire pour le Développement
<b>OOAS</b>	: Organisation Ouest Africaine de la Santé
<b>OCCGE</b>	: Organisation de Coordination et de Coopération pour la lutte Contre les Grandes Endémies
<b>TD</b>	: Travaux Dirigés
<b>TIC</b>	: Technologie de l'Information et de la Communication
<b>TP</b>	: Travaux Pratiques
<b>TPE</b>	: Travail Personnel Etudiant
<b>UE</b>	: Unité d'Enseignement
<b>WAHC</b>	: Communauté Anglophone ouest africaine de la santé
<b>OOAS</b>	: Organisation Ouest Africaine de la Santé
<b>ASLDD</b>	: Assainissement de l'eau et développement durable

## INTRODUCTION DU DIRECTEUR GENERAL DE L'OOAS

L'Organisation Ouest Africaine de la Santé est l'institution spécialisée en santé de la Communauté économique des Etats de l'Afrique de l'Ouest (CEDEAO) avec la seule responsabilité de fournir un leadership dans tous les domaines des soins de santé dans la région.

L'Organisation Ouest Africaine de la Santé a pour mission d'offrir le niveau le plus élevé en matière de prestation de soins de santé aux populations de la sous région. Elle se basera sur l'harmonisation des politiques des Etats Membres, la mise en commun des ressources et la coopération entre les Etats Membres et les pays tiers en vue de trouver collectivement et stratégiquement des solutions aux problèmes de santé de la sous région. Les Chefs d'Etats et de gouvernements ont découvert la nécessité de gérer, motiver et retenir les professionnels de ressources humaines de la santé ; ce qui permettrait de résoudre la crise des ressources humaines de la santé dans les Etats membres de la CEDEAO.



À cette fin, l'Assemblée des Ministres de la Santé de la CEDEAO a décidé de faciliter la formation des professionnels de santé qui répond aux problèmes essentiels de santé, ainsi que la disponibilité et la mobilité des ressources humaines pour la santé dans la région de la CEDEAO. Ceci est également en accord avec la mise en œuvre des actions suivantes:

1. Protocole de la CEDEAO / A/P3/1/03/Dakar et Convention de 2003 sur les A/C.1/1/03 relatifs à l'Education et la formation dans la région de la CEDEAO sur la reconnaissance des établissements d'enseignement et l'équivalence des diplômes, certificats et autres titres de la CEDEAO
2. Adoption d'une résolution sur l'harmonisation des curricula de la CEDEAO par la 7ème Assemblée des Ministres de la Santé (AHM) en Juillet 2006 (Abuja)
3. Adoption d'une résolution sur la motivation et la rétention des ressources humaines de la santé par l'Assemblée des Ministres de la Santé de la CEDEAO, (Yamoussoukro, Côte d'Ivoire 2009)
4. Le plan 2009-2013 du deuxième plan stratégique et opérationnel de l'OOAS a exigé que les programmes basés sur les compétences, doivent être développés pour la formation des agents de santé communautaires de l'espace CEDEAO.

L'harmonisation facilitée par l'OOAS dans la région comprend la formation et la pratique des toutes les professions de santé et pour la profession de santé environnementale qui sont classées sous les professions des disciplines associées de santé. Nous espérons que les universités et les établissements de formation feront usage de ce curriculum harmonisé pour développer, renforcer la capacité des professionnels de la santé et renforcer notre système de soins de santé dans l'espace CEDEAO.

Nous croyons que ce document servira également de véritable plate-forme pour améliorer la mobilité des professionnels de la santé dans l'espace CEDEAO, et par conséquent, promouvoir l'exécution efficace des services préventifs et curatifs de la santé pour les populations de la CEDEAO par du personnel qualifié. Il nous permettra également d'accélérer la réalisation des objectifs du Millénaire pour le développement à l'horizon 2015 et après.

**Dr Xavier CRESPIN**  
**Directeur Général**



## **PREAMBULE**

Ce programme est destiné à la formation des licenciés en santé environnementale conformément aux orientations des politiques de santé des différents pays membres de l'espace CEDEAO. Le programme comporte des modules généraux et des modules spécifiques. Il a été élaboré sur la base des tâches professionnelles que le licencié en santé environnementale sera amené à exécuter sur le terrain.

Les enseignements dispensés en 1<sup>ère</sup> année permettent l'acquisition des connaissances générales en Sciences de base : physique, chimie, mathématique, sociologie, communication.

Les enseignements de la deuxième année sont axés sur les compétences spécifiques du licencié en santé environnementale. Enfin, les enseignements de la troisième année sont axés sur les compétences managériales et la mise en application des compétences spécifiques, ainsi que la recherche.

Le processus d'apprentissage s'effectue à travers un enseignement modulaire et des actes pédagogiques permettant un engagement actif de l'étudiant. Ce programme comporte des enseignements théoriques et pratiques, des stages et des travaux de recherche.

### **1.0 LA PROFESSION DE SANTE ENVIRONNEMENTALE**

La profession de santé environnementale est un service essentiel qui prévoit des solutions face aux causes naturelles et artificielles dans le cadre de la santé environnementale. Pendant plusieurs années les praticiens de la profession ont prouvé l'existence d'une forte corrélation entre l'environnement et l'état de santé. Là où les exigences de la santé environnementale sont respectées, les indices de santé d'une société donnée s'amélioreront énormément. Il y aura réduction du taux de la morbidité et de la mortalité dans ces zones tandis que le taux augmentera dans les zones où ces exigences ne sont pas bien respectées. Ceci a été clairement démontré par les rôles joués par les inspecteurs sanitaires des années 50 et 60 en combattant la menace des maladies telles que la varicelle et la rougeole.

Les succès enregistrés au cours de cette période sont dus au renouvellement des engagements et à une volonté politique. L'un des meilleurs outils requis pour permettre aux gouvernements de réaliser cette tâche est le développement des compétences humaines. À cet effet la nécessité d'examiner de manière critique le programme de formation des techniciens de génie sanitaire impliqués dans l'administration des services de santé environnementale afin d'atteindre l'harmonisation dans la région de la CEDEAO ne peut pas être de trop. Les techniciens de génie sanitaire aident le cadre supérieur à bien mener ses travaux.

### **2.0 OBJECTIFS DU PROCESSUS D'HARMONISATION**

- i. Mettre à jour le domaine d'intervention des cadres professionnels moyens par rapport aux défis actuels nécessaires à l'installation des services de santé environnementale.
- ii. Développer le domaine affectif et cognitif d'un agent professionnel moyen de la santé environnementale à l'application des techniques scientifiques simples qui mèneront à une réduction significative de l'incidence des maladies et des mauvaises conditions de santé.
- iii. Inculquer au cadre professionnel la nécessité de s'améliorer (capacité) ce qui lui permettra ainsi de travailler en toute confiance en tant qu'assistant du cadre supérieur pour bien mener le travail.

### 3.0 OBJECTIFS DE LA FORMATION

A la fin de la formation, le **licencié en santé environnementale** devrait être capable d'atteindre les objectifs spécifiques suivants :

#### *A - OBJECTIFS COGNITIFS*

1. Décrire les principes scientifiques en matière d'identification et d'analyse des problèmes de santé environnementale ;
2. Identifier le mode de communication et la dynamique de groupe nécessaire pour apporter des changements de comportements durables auprès de la communauté ;
3. Décrire le processus d'enquête et d'évaluation nécessaire à l'identification des problèmes de santé environnementale de la communauté ;
4. Décrire en détail les étapes de planning et d'exécution d'un programme de santé environnementale pour résoudre ces problèmes ;
5. Décrire les notions de base en physique, sociologie et biologie, les concepts, les principes et leur application en matière de santé environnementale ;
6. Décrire en détail les maladies transmissibles dans les pays de la CEDEAO, leur mode de transmission ainsi que les méthodes biologique et physique de contrôle de l'environnement afin de les éviter ;
7. Décrire en détail les principales maladies non transmissibles dans les pays de la CEDEAO, les facteurs de risques ainsi que les méthodes biologiques et physiques de contrôle de l'environnement afin de les éviter ;
8. Etablir la liste des lois en matière de santé environnementale du pays ;
9. Expliquer l'application rationnelle des lois en matière de santé environnementale afin d'amener les citoyens à les respecter ;
10. Développer une culture générale solide sur les différentes thématiques environnementales.

#### *B - OBJECTIFS PSYCHOMOTEURS*

1. Appliquer les tests standards de laboratoire employés dans le contrôle de l'environnement physique, l'approvisionnement en eau et l'hygiène alimentaire ;
2. Dimensionner un mode de traitement ;
3. Concevoir les ouvrages d'assainissement autonomes en milieu rural et urbain ;
4. Faire une bonne représentation graphique du mode de traitement de l'eau de boisson et la protection des sources d'eau en milieu rural et urbain ;
5. Mener des actions susceptibles de prévenir les maladies et prolonger la vie ;
6. Assurer un rôle de leadership dans la gestion des risques environnementaux pendant les cas d'urgences ;
7. Gérer les ressources humaines, matérielles et financières mises à sa disposition ;
8. Concevoir une stratégie de gestion d'une épidémie ;
9. Participer à la formation et au recyclage du personnel de santé et d'autres intervenants en matière de santé environnementale ;
10. Analyser d'un point de vue social et sociétal les comportements humains liés aux déchets (comportements et cadres de vie, perceptions et usages, systèmes de prise en charge).
11. Assurer la surveillance de la qualité des eaux de boisson, des aliments et de la salubrité du milieu.
12. Maîtriser parfaitement les différentes filières et technologies de traitement des déchets (type de déchets, type et échelle de collecte, utilisation, transformation, rentabilité).
13. Suivre les travaux tant sur les aspects techniques que financiers jusqu'à la réception des chantiers.
14. Participer à l'organisation, à l'animation, au suivi et à l'évaluation des actions mises en place, en lien avec les équipes techniques.

15. Participer à l'élaboration d'un programme d'actions en s'appuyant sur toutes les compétences internes et externes utiles, en particulier dans le domaine technique (risques technologiques, risques naturels).
16. Assurer la gestion des problèmes de santé environnementale.

### ***C - OBJECTIFS AFFECTIFS***

1. Développer des attitudes pour un travail d'équipe efficace ;
2. Développer une attitude de fierté vis à vis de sa profession ;
3. Faire preuve d'une attitude scientifique par rapport aux enquêtes liées aux activités de sa profession.
4. Faire preuve de vigilance et de concentration constante pour le travail sur le contrôle de qualité, les procédures de réclamation et de déclaration
5. Avoir une bonne connaissance des acteurs du monde des déchets et de la réglementation dans le secteur d'activités spécifique considéré

## **4.0 CADRE DE REFERENCE PEDAGOGIQUE**

L'approche par les compétences sert de cadre de référence pour former les licenciés en santé environnementale aptes à assurer les démarches en promotion et en prévention, à réaliser des activités de gestion des risques environnementaux conformes aux attentes de la population et des professionnels de la santé en vue de protéger l'environnement et la santé publique. Ces compétences-clés constituent des fils conducteurs dans l'élaboration du curriculum.

### **❖ *COMPETENCES PROFESSIONNELLES***

1. Gérer les risques sanitaires liés aux conditions environnementales
2. Informer, sensibiliser, soutenir et former les individus, les familles et les communautés en matière de prévention des risques sanitaires liés à l'environnement
3. Gérer une unité d'hygiène et d'assainissement
4. Développer et améliorer le partenariat entre les acteurs de la santé environnementale
5. Participer à la formation, au recyclage, à la supervision du personnel et à l'encadrement des stagiaires
6. Apporter une assistance à la maîtrise d'ouvrage aux entreprises, aux collectivités, aux organisations professionnelles, aux élus locaux et autres acteurs en matière de santé environnementale.
7. Contribuer à la recherche – action sur l'influence des expositions aux facteurs environnementaux sur la santé;

### **❖ *LISTE DES INSTRUMENTS APPROPRIES D'APPRENTISSAGE***

- Lectures suggérées
- Modules
- Jeux éducatifs
- Projets
- Exposé étudiant
- Séminaires
- Etudes de cas
- Séances de laboratoire
- Stages
- Recherche – Enquête
- Débats
- Schématisation

## ❖ **LISTE DES INSTRUMENTS APPROPRIES A L'EVALUATION DES COMPETENCES ET HABILETES**

- Mise en situation en milieu réel
- Mise en situation en milieu simulé
- Jeux de rôle
- Etudes de cas
- Epreuves de produit
- Entrevues d'évaluation
- Rapports d'analyse

## ❖ **LES MODES D'EVALUATION**

Le mode d'évaluation des étudiants se fait selon le système LMD (voire annexe). Il comprend le contrôle continu avec un examen de fin de semestre. Toutefois, les exposés, les devoirs de maison ou de groupe peuvent faire l'objet d'une évaluation.

Les contrôles sont notés de 0 à 20. Toute absence non justifiée à un contrôle donne lieu à la note zéro. Toutefois, un contrôle de rattrapage est organisé pour les étudiants ayant fourni un justificatif.

## ❖ **LES DEBOUCHES PROFESSIONNELS**

### **a. Les débouchés**

Le tissu professionnel autour des métiers de la santé environnementale est très diversifié, depuis les grandes sociétés internationales jusqu'aux bureaux d'études, ce qui explique que les attentes des professionnels restent très diversifiées. Les métiers de la santé environnementale englobent une multitude d'activités depuis les travaux publics jusqu'aux postes de communication et d'éducation à l'environnement en passant par les études d'ingénierie, diagnostics et entretien des installations de gestion des eaux usées. Ainsi les professionnels recherchent plus des compétences qu'un profil figé de poste.

Cette diversité des profils permet également d'assurer une insertion professionnelle optimale des étudiants motivés et bien formés dans le secteur privé ou public :

- Les missions "environnement/déchets" des collectivités locales et territoriales.
- Les Ministères de la santé publique, de l'habitat, de l'urbanisme, l'Environnement et les administrations déconcentrées.
- Le Ministère de la santé publique.
- Les milieux d'enseignement spécialisés.
- Les bureaux d'études/ONG/ Entreprises.
- Les chambres consulaires et les fédérations professionnelles.
- La presse spécialisée dans les domaines déchets - environnement.

Le métier est appelé à se développer en raison de la multiplication des exigences réglementaires, du développement de la métrologie et des analyses, et de la mise en œuvre de procédés ou matériels nouveaux. Ce métier a des perspectives fortes de développement : importance du traitement de déchets, poids de la réglementation et de la planification au niveau local, introduction du volet gestion des déchets et de celui de la valorisation des ménages dans les appels d'offre publics et privés, poids des objectifs de développement pour le millénaire, politiques de développement pour un environnement durable. Ce sont des facteurs favorables à l'emploi. Aujourd'hui ce sont les métiers liés à la mise en place des services publics d'assainissement non collectif, demain, ce sera la recherche de professionnels du diagnostic des habitations, de la recherche d'économies ou de la récupération en eau potable.

Les étudiants titulaires de la Licence de la santé environnementale peuvent exercer les métiers suivants :

- Responsable d'exploitation eau potable et assainissement ;
- Contrôleur de dispositif d'assainissement autonome ;
- Chargé d'études ;
- Contrôleur de dispositif d'assainissement collectif ;
- Conseiller en gestion des effluents agricoles et industriels et des boues de vidange
- conseiller en matière d'assainissement auprès des collectivités

A l'issue de sa formation, le licencié en santé environnementale travaille principalement sur le terrain ou en laboratoire. Parmi les métiers qui leur sont ouverts :

- **Sur le terrain :** Technicien environnemental (surveillance de l'environnement, inspection, études, enquêtes, suivi de chantier de dépollution de sites)
- **En laboratoire :** Technicien en laboratoire environnemental (suivi de la qualité des eaux, des sols, des aliments, des déchets, de l'air)
- **Dans les administrations (gestion des services) :** conception de plans/programmes/projets, suivi – évaluation, audit, communication

#### **b. Les activités**

- Mettre en place un plan de gestion des déchets en étudiant les différentes approches techniques.
- Mettre en œuvre les schémas locaux d'urbanisme et d'assainissement
- Concevoir des améliorations de l'existant et/ou proposer des activités ou des installations nouvelles.
- Diriger l'équipe de techniciens.
- Réaliser des études (avant projet, projet et réalisation).
- Assurer la surveillance de la qualité et de la sécurité des produits alimentaires, de l'eau de boisson, des milieux (chantiers, habitations, lieux de travail, environnement, lieux publics, établissements classés).
- Assurer la surveillance des maladies vectorielles et le contrôle des vecteurs
- Assurer l'hygiène des établissements de soins
- Vérifier l'application des textes réglementaires dont le non respect peut déboucher sur des procédures contentieuses.
- Informer les professionnels des labels et autres certificats de qualité existants.
- Réaliser des inspections / enquêtes sur le respect des règles de salubrité publique, tout en contrôlant la loyauté des pratiques commerciales (surveillance de la qualité des aliments, etc.).
- Analyser la production des déchets en amont et proposer les solutions de traitement appropriées.
- Apporter des réponses techniques et économiques aux appels d'offres de prestations de services mis par les collectivités locales dans le cadre de la recherche de solutions pour le traitement de leurs déchets (collecte, tri-valorisation, déchetteries).
- Rechercher, analyser et contrôler des matériaux.
- Proposer une filière de traitement appropriée en fonction du type de déchet.

#### **c. Perspectives d'évolution**

La Licence en santé environnementale s'inscrit dans le parcours L/M/D offrant des possibilités de suivre une carrière continue pour une formation supérieure graduelle dans le domaine (Licence, Maîtrise, Doctorat) avec possibilité de formations spécialisées.

## **5.0. POSTES DE TRAVAIL**

- ✓ Districts sanitaires ;
- ✓ Directions régionales ;
- ✓ Services municipaux (collectivités locales et territoriales) ;
- ✓ ONG ;
- ✓ Projets et programmes de santé;
- ✓ Hôpitaux ;
- ✓ Bureaux d'études ;
- ✓ Presse spécialisée dans les domaines de l'environnement ;
- ✓ Tous les Ministères impliqués dans le domaine de l'environnement et services décentralisés,
- ✓ etc.

## **6.0. DUREE DE LA FORMATION**

- 3 ans, soit 6 semestres

## **7.0. CRITERES DE SELECTION DES CANDIDATS**

- Concours direct
- Concours professionnel
- Test de niveau pour les inscriptions à titre privé :

## **8.0. CONDITIONS D'ADMISSION (D'ACCÈS) :**

### **8.0.1 Pour les étudiants**

- **Etre titulaire d'un BAC scientifique série C, D ou équivalent dans les pays anglophones.**
- **Etre admis au concours ou au test**
- **Etre en bonne santé**

### **8.0.2 Pour les professionnels**

- **Etre titulaire d'un Diplôme de technicien d'hygiène et d'assainissement (BEPC+ 3 ans) ou équivalent**
- **Avoir une expérience professionnelle d'au moins 3 ans**
- **Etre admis au concours ou au test**
- **Etre en bonne santé.**

## **9.0. TITRE DU DIPLOME A DELIVRER**

- Licence en Santé Environnementale

## **10.0. MODALITES DES EXAMENS**

### ***10.0.1. Organisation des examens***

Au terme de la formation un examen final sera organisé.

Un comité d'organisation de cet examen sera composé des représentants des écoles/instituts, des représentants du ministère de la santé et des représentants du ministère de l'enseignement supérieur.

### ***10.0.2. Période d'examen, vacances***

### ***10.0.3. Période d'examen***

- Fin juillet



- **Vacances**

- Août et septembre

## **11.0. STAGES**

Les stages interviendront à la fin de l'enseignement du référentiel théorique, de préférence en fin d'année.

### **Durée des stages pratiques :**

1 <sup>ère</sup> année :	1 mois
2 <sup>ème</sup> année :	2 mois
3 <sup>ème</sup> année :	3 mois

La préparation au Diplôme **du licencié en santé environnementale** comporte Trois (3) catégories de stages :

### **Domaines précis de stage :**

- 1<sup>ère</sup> année: Un stage en Génie civil ;
- 2<sup>ème</sup> année: Un stage en Hygiène de l'environnement ;
- 3<sup>ème</sup> année: Un stage d'application.

L'acceptation du stage est conditionnée par la validation de toutes les compétences prévues dans le carnet de stage. Le passage en année supérieure et l'obtention du diplôme sont conditionnés par la validation des stages.

### **Rapport de stage**

Un rapport en fin de chaque stage doit être élaboré par l'étudiant sous la supervision d'un Directeur de stage.

## **12.0. CONDITIONS DE MISE EN ŒUVRE DU PROGRAMME**

**Avoir des enseignants de haut niveau titulaires, pour les :**

### **Cours théoriques,**

- Maîtrise ou ingénieur
- Doctorat

### **Cours Pratiques,**

- Maîtrise ou ingénieur
- Doctorat
- Licencié/Technicien d'hygiène et assainissement avec une expérience professionnelle d'au moins 3 ans.

### **Avoir un équipement adéquat :**

- matériels de dessin;
- matériels de construction et de topographie;
- Matériels de désinfection et de lutte contre les vecteurs de maladies;
- Matériels d'analyse de l'air, des eaux, des aliments, de sol, des déchets;
- Matériels informatiques ;

- Tout autre équipement ou matériel nécessaire à la formation en santé environnementale.

**NB. Les équipements ne peuvent donner des résultats escomptés sans la présence des infrastructures (salle de démonstration, laboratoire, salle informatique....)**

### **13.0. REGLEMENTATION DE LA FORMATION ET DE L'EXERCICE DE LA FONCTION**

La formation et l'exercice de la fonction nécessite une réglementation ;

#### **13.1. Formation**

- Autorisation de la création de l'école/institut
- Arrêté déterminant le programme de formation
- Arrêté fixant le profil des enseignants

#### **13.2. Fonction**

- Création de l'Ordre des professionnels de santé environnementale
- Autorisation d'exercice
- Code de déontologie

#### **13.3. Création d'un conseil sous régional des professionnels :**

##### ***1. Constitution du conseil***

- Un représentant de l'ordre de chaque pays
- Un représentant de l'OOAS.

##### ***2. Attributions du conseil***

- Réglementation de la profession
- Recherche dans le domaine de l'environnement
- Coordination des activités
- Vérification de l'applicabilité des textes réglementaires
- Vérification régulière de l'évolution de la réglementation.

##### ***3. Mode de création et coordination du Conseil***

- Organisation d'une assemblée générale des différents représentants,
- La coordination sera assurée par un représentant de l'OOAS.

### **14.0. CONVENTION POUR LA NOMENCLATURE DES MATIERES**

➤ Les lettres indiquent le type d'unité d'enseignement, cinq (5) au total ainsi nommés :

- ⊙ Sciences de base : SB
- ⊙ Sciences en santé publique : SSP
- ⊙ Sciences de santé environnementale: SSE
- ⊙ Sciences managériales : SM
- ⊙ Etudes générales : EG

- Le premier chiffre définit le semestre,
- Le deuxième chiffre identifie le cours (la matière) de l'unité d'enseignement,
- Les deux groupes de chiffres sont séparés par une barre oblique.

## 15.0. PROGRAMME DE FORMATION

Il comprend cinq (5) Unités d'Enseignement (UE) subdivisées en quarante trois (43) matières avec trois (3) stages répartis sur les trois (3) années académiques.

**Nb. Les heures de travail personnel de l'étudiant sont obligatoires et incluses dans les crédits de chaque matière.**

### PREMIERE ANNEE - PREMIER SEMESTRE

Code du cours	Titre du cours	Modules	Heures	Théorie <sup>2</sup>	Pratiques <sup>2</sup>	Crédits <sup>1</sup>
SBI/1	Physique		40	20	20	2
SBI/2	Chimie appliquée et organique		40	20	20	2
SBI/3	Anatomie et physiologie		40	20	20	2
SBI/4	Écologie/Géologie	Géologie générale	40	20	20	2
		Hydrogéologie				
SSEI/1	Construction de bâtiments et réalisation d'ouvrages d'assainissement	Génie civil	120	60	60	6
		Topographie				
SSEI/2	Dessin technique		60	30	30	3
SBI/5	Mathématiques Appliquées		40	20	20	2
SMI/1	Sociologie et Anthropologie	Socioanthropologie de la santé	60	30	30	3
		Socio-anthropologie de l'environnement				
SMI/2	Initiation à l'informatique /Bibliothèque	Informatique	60	20	40	3
		Recherche documentaire				
SBI/6	Microbiologie	Bactériologie – virologie	60	30	30	3
		Parasitologie				
EGI/1	Communication en anglais		40	20	20	2
<b>Total</b>			<b>600</b>	<b>290</b>	<b>310</b>	<b>30</b>

<sup>1</sup> Un crédit équivaut à 20 heures

<sup>2</sup> le volume horaire total doit être respecté pour chaque cours. Cependant, il peut y avoir une flexibilité dans la répartition entre le volume horaire théorique et celui des travaux pratiques.

**PREMIERE ANNEE - DEUXIEME SEMESTRE (stage 1 mois)**

<b>Code du cours</b>	<b>Titre du cours</b>		<b>Heures</b>	<b>Théorie</b>	<b>Pratiques</b>	<b>Crédits</b>
EGI/2	Planification et développement		60	30	30	3
SSEI/3	Développement durable		40	20	20	2
SSEI/4	Changements climatiques		40	20	20	2
SSEI/5	Gestion des désastres et le bioterrorisme		60	30	30	3
SMI/3	Planification et gestion de projets		40	20	20	2
SSEI/6	Epidémiologie	Epidémiologie descriptive	60	30	30	3
		Epidémiologie analytique				
SSPI/1	Santé communautaire I		40	20	20	2
SSPI/2	Maladies transmissibles et non transmissibles	Maladies hydriques	60	30	30	3
		Maladies à transmission vectorielle				
		Maladies non transmissibles				
SSPI/3	Systèmes de gestion des informations en matière de santé I		40	20	20	2
SSEI/7	<b>Stage en génie civil</b>		160	---	160	8
<b>Total</b>			<b>600</b>	<b>220</b>	<b>380</b>	<b>30</b>

**DEUXIEME ANNEE - PREMIER SEMESTRE**

Code du cours	Titre du cours		Heures	Théorie	Pratiques	Crédits
SSEII/8	Denrées alimentaires : Hygiène et pathologies	Microbiologie alimentaire	80	40	40	4
		Hygiène alimentaire et nutrition				
SSEII/9	Santé au travail	Pathologies professionnelles	80	40	40	4
		Hygiène et sécurité au travail				
SSEII/10	Ventilation des établissements publics et privés		80	40	40	4
SSEII/11	Lutte contre les Vecteurs de maladies		80	40	40	4
SSEII/12	Education et promotion de la santé environnementale		80	40	40	4
SSPII/4	Systèmes de gestion des informations en matière de santé II		60	30	30	3
SSPII/5	Santé communautaire II		40	20	20	2
SSEII/13	Gestion des déchets	Assainissement des eaux usées	100	60	40	5
		Assainissement des déchets solides				
Total			600	310	290	30

**DEUXIEME ANNEE - DEUXIEME SEMESTRE (stages 2 mois)**

Code du cours	Titre du cours		Heures	Théorie	Pratiques	Crédits
SSEII/14	Lois en santé environnementale et les processus légaux	Droit de l'environnement	40	20	20	2
		Droit de la santé environnementale				
SSEII/15	Gestion de l'air		40	20	20	2
SSEII/16	Ressources en eau et la gestion de la qualité	Hydraulique	100	50	50	5
		Approvisionnement en eau potable				
SSEII/17	Lutte contre la pollution		80	40	40	4
SSPII/6	Education et promotion de la santé		80	40	40	4
SSEII/18	Eco-toxicologie		60	30	30	3
SSEII/19	Gestion des cadavres et établissements mortuaires		40	20	20	2
SSEII/20	Inspection sanitaire des Lieux	Inspection des établissements classés	80	40	40	4
		Inspection des établissements recevant du public				
SSPII/7	Hygiène hospitalière		40	30	10	2
<b>Total</b>			<b>560</b>	<b>290</b>	<b>270</b>	<b>28</b>

**Stage d'hygiène de l'environnement**

Code cours	Titre du cours		Heures	Théorie	Pratiques	Crédits
SSEII/21	Stage d'hygiène de l'environnement		320	0	320	16

### TROISIEME ANNEE - PREMIER SEMESTRE

Code du cours	Titre du cours		Heures	Théorie	Pratiques	Crédits
SSEIII/22	Logement	Habitat et santé publique	100	50	50	5
		Urbanisme				
		Hygiène de l'habitat				
SSEIII/23	Ethique et code de déontologie		80	40	40	4
EGIII/3	Rédaction administrative		40	20	20	2
SSEIII/24	Etude d'impact environnemental	Impacts environnemental et social	160	80	80	8
		Gestion des risques environnementaux				
SSEIII/25	Gestion de la sécurité	Sécurité sanitaire	40	20	20	2
		Sécurité environnementale				
SSPIII/8	Biostatistique et méthodologie de recherche		180	90	90	9
<b>Total</b>			<b>600</b>	<b>300</b>	<b>300</b>	<b>30</b>

### TROISIEME ANNEE - DEUXIEME SEMESTRE

Code du Cours	Titre du cours		Heures	Théorie	Pratiques	Crédits
SSEIII/26	Stage pratique (3 mois)		600	0	600	30
SSEIII/27	Rédaction et présentation du mémoire		200	0	200	10
<b>Total</b>			<b>800</b>	<b>0</b>	<b>800</b>	<b>40</b>

### RECAPITULATIF DES HORAIRES

ANN2E D4ETUDES	Heures	Théorie	Pratiques	Crédits
PREMIERE ANNEE	1 200	510	690	70
DEUXIEME ANNEE	1 200	600	600	60
TROISIEME ANNEE	1 400	300	1200	70
<b>Total</b>	<b>3 800</b>	<b>1410</b>	<b>2490</b>	<b>200</b>

## 16.0. ORGANISATION DES U.E. ET DES MATIERES

### ⊙ Sciences de base : SB

Code du cours	Titre du cours	Heures	Théorie	Pratiques	Crédits
SBI/1	Physique	40	20	20	2
SBI/2	Chimie appliquée et organique	40	20	20	2
SBI/3	Anatomie et physiologie	40	20	20	2
SBI/4	Écologie/Géologie	40	20	20	2
SBI/5	Mathématiques Appliquées	40	20	20	2
SBI/6	Microbiologie	60	30	30	3
<b>Total</b>		<b>260</b>	<b>130</b>	<b>130</b>	<b>13</b>

### ⊙ Sciences en santé publique : SSP

Code du cours	Titre du cours	Heures	Théorie	Pratiques	Crédits
SSPI/1	Santé communautaire I	40	20	20	2
SSPI/2	Maladies transmissibles et non transmissible	60	30	30	3
SSPI/3	Systèmes de gestion des informations en matière de santé I	40	20	20	2
SSPII/4	Systèmes de gestion des informations en matière de santé II	40	20	20	2
SSPII/5	Santé communautaire II	40	20	20	2
SSPII/6	Education et promotion de la santé	40	20	20	2
SSPII/7	Hygiène hospitalière	40	30	10	2
SSPIII/8	Biostatistique et méthodologie de recherche	180	90	90	9
<b>Total</b>		<b>480</b>	<b>250</b>	<b>230</b>	<b>24</b>

### ⊙ Sciences de santé environnementale: SSE

Code du cours	Titre du cours	Heures	Théorie	Pratiques	Crédits
SSEI/1	Construction de bâtiments et réalisation d'ouvrages d'assainissement	120	60	60	6
SSEI/2	Dessin technique	60	30	30	3
SSEI/3	Développement durable	40	20	20	2
SSEI/4	Changements climatiques	40	20	20	2
SSEI/5	Gestion des désastres et le bioterrorisme	60	30	30	3
SSEI/6	Epidémiologie	60	30	30	3
SSEI/7	<b>Stage en génie civil</b>	160	---	160	8
<b>TOTAL</b>		<b>540</b>	<b>190</b>	<b>350</b>	<b>27</b>



Code du cours	Titre du cours	Heures	Théorie	Pratiques	Crédits
SSEII/8	Denrées alimentaires : Hygiène et pathologies	80	40	40	4
SSEII/9	Santé au travail	40	20	20	2
SSEII/10	Ventilation des établissements publics et privés	40	20	20	2
SSEII/11	Lutte contre les Vecteurs de maladies	60	30	30	3
SSEII/12	Education et promotion de la santé environnementale	40	20	20	2
SSEII/13	Gestion des déchets	100	60	40	5
SSEII/14	Lois en santé environnementale et les processus légaux	40	20	20	2
SSEII/15	Gestion de l'air liquide	40	20	20	2
SSEII/16	Ressources en eau et la gestion de la qualité	60	30	30	3
SSEII/17	Lutte contre la pollution	80	40	40	4
SSEII/18	Eco-toxicologie	60	30	30	3
SSEII/19	Gestion des cadavres et établissements mortuaires	40	20	20	2
SSEII/20	Inspection sanitaire des Lieux	80	40	40	4
SSEII/21	Stage d'hygiène de l'environnement	320	0	320	16
<b>Total</b>		<b>1080</b>	<b>390</b>	<b>690</b>	<b>54</b>
Code du cours	Titre du cours	Heures	Théorie	Pratiques	Crédits
SSEIII/22	Logement	100	50	50	5
SSEIII/23	Ethique et code de déontologie	80	40	40	4
SSEIII/24	Etude d'impact environnemental	160	80	80	8
SSEIII/25	Gestion de la sécurité	40	20	20	2
SSEIII/26	Stage pratique (3 mois)	480	0	480	24
SSEIII/27	<b>Rédaction et présentation du rapport du mémoire</b>	120	0	120	6
<b>Total</b>		<b>980</b>	<b>190</b>	<b>790</b>	<b>49</b>

⊙ **Sciences managériales : SM**

Code du cours	Titre du cours	Heures	Théorie	Pratiques	Crédits
SMI/1	Sociologie et Anthropologie	60	30	30	3
SMI/2	Initiation à l'informatique /Bibliothèque	60	20	40	3
SMI/3	Planification et gestion de projets	40	20	20	2
<b>Total</b>		<b>160</b>	<b>70</b>	<b>90</b>	<b>8</b>

⊙ **Etudes générales : EG**

Code du cours	Titre du cours	Heures	Théorie	Pratiques	Crédits
EGI/1	Communication en anglais	40	20	20	2
EGI/2	Planification et développement	60	30	30	3
EGIII/3	Rédaction administrative	40	20	20	2
<b>Total</b>		<b>140</b>	<b>70</b>	<b>70</b>	<b>7</b>

## 7.0. OBJECTIFS ET CONTENUS DES MATIERES/COURS

1.	<p><b>PHYSIQUE</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Décrire les processus de transferts de la chaleur de la température et de la pression liée aux mouvements de l'atmosphère et de l'eau</li> <li>2. Expliquer les propriétés physiques de l'eau, de l'air et du sol</li> <li>3. Décrire les propriétés physiques des matériaux de construction</li> <li>4. Appliquer les mesures et les conversions de base</li> <li>5. Discuter les dangers des métiers en rapport avec l'environnement et la physique.</li> </ol> <p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>• Les processus physiques (le transfert de chaleur, la température et la pression liés aux mouvements de l'atmosphère et de l'eau)</li> <li>• Les propriétés physiques de l'eau, de l'air et du sol</li> <li>• Les propriétés des matériaux de construction</li> <li>• Les mesures et les conversions de base</li> <li>• Thermodynamique</li> <li>• Lois des gaz</li> <li>• Ondes et théorie des ondes</li> <li>• Ionisation et radiation non ionique</li> </ul>
2.	<p><b>CHIMIE APPLIQUEE ET ORGANIQUE</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Appliquer les mesures et les conversions de base</li> <li>2. Décrire les principes de base de la chimie</li> <li>3. Décrire la chimie de l'air, de l'eau, de sol et des aliments</li> <li>4. Décrire le mouvement, le stockage et le recyclage des produits chimiques dans l'environnement</li> <li>5. Décrire l'incidence de la pollution chimique sur l'environnement et la santé</li> <li>6. Décrire les métiers de la chimie et les risques environnementaux</li> <li>7. Décrire les propriétés chimiques des matériaux de construction</li> <li>8. Identifier les avantages et les limites des instruments utilisés pour l'analyse des échantillons qui inclut:             <ul style="list-style-type: none"> <li>• Spectrométrie de masse</li> <li>• Chromatographie en phase gazeuse</li> <li>• Spectrométrie par absorption atomique</li> <li>• Chromatographie de liquide à haute pression</li> </ul> </li> <li>9. Expliquer les principes des détergents et des désinfectants</li> <li>10. Identifier les risques physiques, biologiques et chimiques.</li> <li>11. Identifiez les principaux groupes d'aliments</li> <li>12. Décrire les principaux principes de la chimie alimentaire</li> <li>13. Appliquer les méthodes standards pour évaluer la composition chimique des nourritures</li> <li>14. Atome molécule, orbitale, mésomérie, stéréochimie, acides, bases</li> <li>15. Expliquer la nomenclature en chimie organique</li> <li>16. Identifier les groupes fonctionnels</li> <li>17. Expliquer les mécanismes de base</li> </ol>

	<p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>○ Les mesures et les conversions de base</li> <li>○ Les principes de base de la chimie</li> <li>○ La chimie de l'air, de l'eau, de sol et des aliments</li> <li>○ Le mouvement, le stockage et le recyclage des produits chimiques dans l'environnement</li> <li>○ l'incidence de la pollution chimique sur l'environnement et la santé</li> <li>○ les métiers de la chimie et les risques environnementaux</li> <li>○ les propriétés des matériaux de construction</li> <li>○ les avantages et les limites des instruments utilisés pour l'analyse des échantillons qui inclut la Spectrométrie de masse, la Chromatographie en phase gazeuse, la Spectrométrie par absorption atomique, la Chromatographie de liquide à haute pression.</li> <li>○ les principes des détergents et des désinfectants</li> <li>○ les risques physiques, biologiques et chimiques.</li> <li>○ les principaux groupes d'aliments</li> <li>○ les principaux principes de la chimie alimentaire</li> <li>○ les méthodes standards pour évaluer la composition chimique des nourritures</li> <li>○ la nomenclature des composés organiques</li> <li>○ Les composés aliphatiques</li> <li>○ Les composés aromatiques</li> <li>○ Les autres groupes fonctionnels : les alcools, les amines, composés carbonylés, les acides carboxyliques, phénols, les éthers</li> <li>○ les mécanismes de base</li> </ul>
3.	<p><b>ANATOMIE ET PHYSIOLOGIE</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Décrire la structure humaine normale et sa fonction dans un contexte de santé</li> <li>2. Décrire l'anatomie, la physiologie, la pathologie des hommes, des animaux et des plantes</li> <li>3. Décrire et communiquer la structure et la fonction des systèmes spécifiques du corps et de la plante</li> <li>4. Décrire les systèmes circulatoire, nerveux, respiratoire, endocrinien, digestif et urinaires par rapport à l'impact de l'exposition et aux effets sur la santé des produits chimiques, biologiques, physiques et psychosociaux</li> <li>5. Expliquer les principes de la surveillance biologique</li> </ol> <p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>• la structure humaine normale et sa fonction dans un contexte de santé</li> <li>• l'anatomie, la physiologie, la pathologie des hommes, des animaux et des plantes</li> <li>• la structure et la fonction des systèmes spécifiques du corps et de la plante</li> <li>• les systèmes circulatoire, nerveux, respiratoire, endocrinien, digestif et urinaires par rapport à l'impact de l'exposition et aux effets sur la santé des produits chimiques, biologiques, physiques et psychosociaux</li> <li>• les principes de la surveillance biologique</li> </ul>
4.	<p><b>ÉCOLOGIE/GÉOLOGIE</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Décrire les principes de l'écologie et de la géologie ;</li> <li>2. Communiquer par rapport à la géologie et le développement durable</li> </ol>

	<ol style="list-style-type: none"> <li>3. Expliquer l'environnement comme un complexe de l'interaction des systèmes biophysiques sociaux, économiques/politiques.</li> <li>4. Discuter la formation minérale de substances : amiante, silice, huile etc.</li> <li>5. Expliquer la science de base du sol par rapport à la migration des eaux souterraines et à la perméabilité des polluants dans divers types de sol.</li> <li>6. Expliquer le bâtiment, les matériaux et les méthodes applicables.</li> <li>7. Expliquer la mécanique liée aux structures du sol.</li> <li>8. Décrire les principes de l'écologie et la géologie et leur relation avec la sécurité alimentaire et la chaîne de nourriture</li> </ol> <p><b><u>Contenu</u></b></p> <ol style="list-style-type: none"> <li>a. les principes de l'écologie et de la géologie ;</li> <li>b. la géologie et le développement durable</li> <li>c. l'environnement comme un complexe de l'interaction des systèmes biophysiques sociaux, économiques/politiques.</li> <li>d. la formation minérale de substances : amiante, silice, huile etc.</li> <li>e. la science de base du sol par rapport à la migration des eaux souterraines et à la perméabilité des polluants dans divers types de sol.</li> <li>f. le bâtiment, les matériaux et les méthodes applicables.</li> <li>g. la mécanique liée aux structures du sol.</li> <li>h. les principes de l'écologie et la géologie et leur relation avec la sécurité alimentaire et la chaîne de nourriture</li> </ol>
5.	<p><b>CONSTRUCTION DE BATIMENTS ET REALISATION DES OUVRAGES D'ASSAINISEMENT</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Expliquer le comportement de différentes matières employées dans la construction des bâtiments</li> <li>2. Identifier les avantages et les inconvénients de différents matériaux de construction.</li> <li>3. Expliquer les différents types de charges sur une fondation</li> <li>4. Décrire la convenance d'un emplacement sur lequel on doit construire un bâtiment standard</li> <li>5. Décrire le travail nécessaire à faire pour permettre l'emplacement du drainage, le nivellement, l'orientation, les entrées, l'évacuation d'eau de surface, l'emplacement des ouvrages d'assainissement</li> <li>6. Déterminer les efforts et les contraintes des matériaux de construction</li> <li>7. Evaluer la convenance des infrastructures du bâtiment (approvisionnement en eau, les systèmes de chauffage, les installations électriques et la protection contre les incendies</li> <li>8. Appliquer de manière critique les principes clés de la construction de bâtiments et des ouvrages d'assainissement</li> <li>9. Appliquer les principes fondamentaux des sciences environnementales à l'évaluation des facteurs de confort de l'homme, l'humidité, la condensation et la ventilation liés aux formes alternatives de construction de bâtiments</li> <li>10. Elaborer des devis pour la construction des ouvrages d'assainissement autonome</li> </ol> <p><b><u>Contenu</u></b></p> <ol style="list-style-type: none"> <li>a. le comportement de différentes matières employées dans la construction des bâtiments</li> <li>b. les avantages et les inconvénients de différents matériaux de construction.</li> </ol>

	<ul style="list-style-type: none"> <li>c. les différents types de charges sur une fondation</li> <li>d. la convenance d'un emplacement sur lequel on doit construire un bâtiment standard</li> <li>e. le travail nécessaire à faire pour permettre l'emplacement du drainage, le nivellement, l'orientation, les entrées, l'évacuation d'eau de surface, l'emplacement des ouvrages d'assainissement</li> <li>f. les efforts et les contraintes des matériaux de construction</li> <li>g. Evaluation de la convenance des infrastructures du bâtiment (approvisionnement en eau , les systèmes de chauffage, les installations électriques et la protection contre les incendies</li> <li>h. les principes clés de la construction de bâtiments et des ouvrages d'assainissement</li> <li>i. les principes fondamentaux des sciences environnementales dans l'évaluation des facteurs de confort de l'homme, l'humidité, la condensation et la ventilation liés aux formes alternatives de construction de bâtiments</li> <li>j. Plans et devis des ouvrages d'assainissement autonome</li> </ul>
6.	<p><b>DESSIN TECHNIQUE</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ul style="list-style-type: none"> <li>1. Expliquer la signification et les objectifs du dessin technique</li> <li>2. Expliquer les formes de conversion du système international de mesure</li> <li>3. Appliquer les règles conventionnelles de représentation graphiques des bâtiments et ouvrages d'assainissement,</li> <li>4. Tracer les différentes figures géométriques du domaine du dessin,</li> <li>5. Exécuter les différentes faces, les différentes coupes, les différents types de perspectives d'une pièce ou d'un élément d'ouvrage</li> <li>6. Exécuter et interpréter la cotation d'un plan, les vues en plan, les perspectives et les coupes en plan.</li> <li>7. Expliquer les modalités de reproduction, de pliage et de classement de la feuille de dessin</li> </ul> <p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>a. la signification et les objectifs du dessin technique</li> <li>b. les formes de conversion du système international de mesure</li> <li>c. les règles conventionnelles de représentation graphiques des bâtiments et ouvrages d'assainissement,</li> <li>d. les différentes figures géométriques du domaine du dessin,</li> <li>e. les différentes faces, les différentes coupes, les différents types de perspectives d'une pièce ou d'un élément d'ouvrage</li> <li>f. Exécution et interprétation de la cotation d'un plan, des vues en plan, des perspectives et des coupes en plan.</li> <li>g. les modalités de reproduction, de pliage et de classement de la feuille de dessin</li> </ul>
7.	<p><b>MATHEMATIQUES APPLIQUEES</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ul style="list-style-type: none"> <li>1. Appliquer la connaissance théorique à la pratique des domaines suivants : <ul style="list-style-type: none"> <li>• Conversions</li> <li>• Système métrique</li> <li>• Fonctions simples et graphiques</li> <li>• Statistiques descriptives</li> <li>• Lois exponentielles et les logarithmes.</li> <li>• Arithmétique et calculs</li> </ul> </li> </ul>

	<ol style="list-style-type: none"> <li>2. Appliquer le calcul et la conversion de la qualité de l'air et du prélèvement d'eau, de la dispersion modelant, des calculs d'émission, de la durée de vie de remblai et du calcul de la capacité de l'eau potable et des eaux usées</li> <li>3. Appliquer les formules appropriées pour résoudre les problèmes liés au bâtiment et à la construction.</li> <li>4. Appliquer la conversion, les systèmes métriques, les fonctions simples et les graphiques</li> <li>5. Expliquer la signification et l'importance de l'évaluation de la santé</li> </ol> <p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>- Application de la connaissance théorique à la pratique des domaines suivants : <ul style="list-style-type: none"> <li>• Conversions</li> <li>• Système métrique</li> <li>• Fonctions simples et graphiques</li> <li>• Statistiques descriptives</li> <li>• Lois exponentielles et les logarithmes.</li> <li>• Arithmétique et calculs</li> </ul> </li> <li>- le calcul et la conversion de la qualité de l'air et du prélèvement d'eau, de la dispersion modelant, des calculs d'émission, de la durée de vie de remblai et du calcul de la capacité de l'eau potable et des eaux usées</li> <li>- les formules appropriées pour résoudre les problèmes liés au bâtiment et à la construction.</li> <li>- la conversion, les systèmes métriques, les fonctions simples et les graphiques</li> <li>- la signification et l'importance de l'évaluation de la santé</li> </ul>
8.	<p><b>SOCIOLOGIE ET ANTHROPOLOGIE</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Décrire les principes sociaux et psychologiques de base concernant les processus de participation et de consultation du public (population)</li> <li>2. Décrire et communiquer le comportement humain en termes d'aspects spécifiques de la santé environnementale (la psychologie environnementale c'est à dire le stress et les émotions etc.)</li> <li>3. Evaluer les visions mondiales sur la culture concernant la promotion de la santé.</li> <li>4. Décrire l'importance des systèmes indigènes de la connaissance</li> <li>5. Appliquer les principes de la dynamique de groupe dans les groupes sociaux</li> <li>6. Décrire l'importance de la culture et la socialisation dans la santé environnementale</li> <li>7. Décrire le développement humain à travers l'espérance de vie</li> <li>8. Relier les impacts sociaux au processus d'évaluation des incidences sur l'environnement</li> <li>9. Décrire les aspects sociaux de la planification environnementale</li> <li>10. Décrire le rôle de la santé environnementale par rapport au bien-être</li> <li>11. Décrire la construction sociale, biologique, chimique de l'environnement par rapport à la santé des personnes</li> <li>12. Identifier et expliquer les inégalités dans la santé</li> </ol> <p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>• les principes sociaux et psychologiques de base concernant les processus de participation et de consultation du public (population)</li> <li>• le comportement humain en termes d'aspects spécifiques de la santé environnementale (la psychologie environnementale c'est à dire le stress et les</li> </ul>

	<p>émotions etc.)</p> <ul style="list-style-type: none"> <li>• les visions mondiales sur la culture concernant la promotion de la santé.</li> <li>• l'importance des systèmes indigènes de la connaissance</li> <li>• les principes de la dynamique de groupe dans les groupes sociaux</li> <li>• l'importance de la culture et la socialisation dans la santé environnementale</li> <li>• le développement humain à travers l'espérance de vie</li> <li>• les impacts sociaux au processus d'évaluation des incidences sur l'environnement</li> <li>• les aspects sociaux de la planification environnementale</li> <li>• le rôle de la santé environnementale par rapport au bien-être</li> <li>• la construction sociale, biologique, chimique de l'environnement par rapport à la santé des personnes</li> <li>• les inégalités dans la santé</li> </ul>
9.	<p><b>INITIATION A L'INFORMATIQUE /BIBLIOTHEQUE</b></p> <p><b><u>OBJECTIFS d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Connaître les notions de base en informatique</li> <li>2. Connaître les notions de TIC</li> <li>3. Utiliser les logiciels de traitement de texte et des données</li> <li>4. Utiliser l'internet pour la recherche documentaire</li> </ol> <p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>• les notions de base en informatique</li> <li>• les notions de TIC</li> <li>• les logiciels de traitement de texte (word, excel, power point)</li> <li>• l'internet et la recherche documentaire</li> <li>• Mise à niveau, recherche encyclopédie, recherche documentaire, utilisation d'un moteur de recherche et formulation d'équation de recherche, recherche d'articles, de périodiques.</li> </ul>
10.	<p><b>MICROBIOLOGIE ET PARASITOLOGIE</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Décrire la structure et la fonction des microorganismes pathogènes potentiels par rapport à la qualité de l'air, de l'eau et du sol</li> <li>2. Décrire la gamme des micro-organismes présents dans l'air, dans la nourriture, dans l'eau et dans le sol, leurs origines et leur mécanisme de propagation</li> <li>3. Décrire les risques biologiques dans le lieu de travail</li> <li>4. Appliquer les techniques appropriées et pertinentes de microscope pour l'analyse de l'eau, la sécurité professionnelle dans le domaine de la santé et la sécurité alimentaire</li> <li>5. Décrire le rôle des micro-organismes dans l'air, la nourriture, l'eau et le sol par rapport à la pollution</li> <li>6. Décrire les principaux termes et principes concernant la survie, la croissance et la destruction des micro-organismes</li> <li>7. Décrire les méthodes pour limiter la croissance des micro-organismes dans la nourriture</li> </ol> <p><b><u>Contenu</u></b></p> <ol style="list-style-type: none"> <li>a. la structure et la fonction des microorganismes pathogènes potentiels par rapport à la qualité de l'air, de l'eau et du sol</li> <li>b. la gamme des micro-organismes présents dans l'air, dans la nourriture, dans l'eau et dans le sol, leurs origines et leur mécanisme de propagation</li> <li>c. les risques biologiques dans le lieu de travail</li> </ol>

	<p>d. les techniques appropriées et pertinentes de microscope pour l'analyse de l'eau, la sécurité professionnelle dans le domaine de la santé et la sécurité alimentaire</p> <p>e. le rôle des micro-organismes dans l'air, la nourriture, l'eau et le sol par rapport à la pollution</p> <p>f. les principaux termes et principes concernant la survie, la croissance et la destruction des micro-organismes</p> <p>g. les méthodes pour limiter la croissance des micro-organismes dans la nourriture</p>
11.	<p><b>COMMUNICATION EN ANGLAIS</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Utiliser par l'expression orale les concepts et vocables de la santé environnementale ;</li> <li>2. Utiliser les structures grammaticales nécessaires et appropriées en communiquant avec autrui</li> <li>3. Utiliser à l'écrit les concepts et vocables de la santé environnementale ;</li> </ol> <p><b><u>Contenu</u></b></p> <ol style="list-style-type: none"> <li>a. Utilisation par l'expression orale des concepts et vocables de la santé environnementale ;</li> <li>b. Utilisation des structures grammaticales nécessaires et appropriées en communiquant avec autrui</li> <li>c. Utilisation à l'écrit les concepts et vocables de la santé environnementale ;</li> </ol>
12.	<p><b>PLANIFICATION ET DEVELOPPEMENT</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Décrire les divers principes et systèmes de la planification environnementale au niveau local et national.</li> <li>2. Décrire les instruments et les concepts de planification</li> <li>3. Appliquer les instruments de la planification</li> <li>4. Analyser et communiquer les résultats en termes de cadre de normalisation.</li> <li>5. Contrôler et évaluer les plans pour les bâtiments à usage d'habitation et commerciale</li> <li>6. Décrire les activités liées à la mise en valeur d'une parcelle.</li> <li>7. Appliquer les législations en vigueur pour la gestion efficace des occupations illégales ou anarchiques des parcelles</li> </ol> <p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>• les divers principes et systèmes de la planification environnementale au niveau local et national.</li> <li>• les instruments et les concepts de planification</li> <li>• les instruments de la planification</li> <li>• Analyse et communication des résultats en termes de cadre de normalisation.</li> <li>• Contrôle et évaluation des plans pour les bâtiments à usage d'habitation et commerciale</li> <li>• les activités liées à la mise en valeur d'une parcelle.</li> <li>• Application des législations en vigueur pour la gestion efficace des occupations illégales ou anarchiques des parcelles</li> </ul>



13.	<p><b>DEVELOPPEMENT DURABLE</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Décrire les conseils et les recueils d'instructions internationaux.</li> <li>2. Décrire le cadre national et international pour la santé environnementale.</li> <li>3. Décrire les cadres nationaux et internationaux qui soutiennent le développement durable (agenda 21, déclaration de Rio, OMD, WSSD, NEPAD)</li> <li>4. Evaluer les projets de construction en conformité avec les principes du développement durable.</li> <li>5. Appliquer les cadres nationaux et internationaux qui soutiennent le développement durable (agenda 21, déclaration de Rio, MDGs, WSSD, NEPAD)</li> </ol> <p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>• les conseils et les recueils d'instructions internationaux.</li> <li>• le cadre national et international pour la santé environnementale.</li> <li>• les cadres nationaux et internationaux qui soutiennent le développement durable (agenda 21, déclaration de Rio, OMD, WSSD, NEPAD)</li> <li>• Evaluation des projets de construction en conformité avec les principes du développement durable.</li> <li>• Application des cadres nationaux et internationaux qui soutiennent le développement durable (agenda 21, déclaration de Rio, MDGs, WSSD, NEPAD)</li> </ul>
14.	<p><b>CHANGEMENTS DE CLIMATIQUES</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Intégrer aux connaissances actuelles, les fondements de la science des changements climatiques et les multiples enjeux environnementaux, sociaux, politiques et économiques découlant de ce phénomène;</li> <li>2. appliquer une approche interdisciplinaire et systémique à des problèmes spécifiques dans le cadre des changements climatiques;</li> <li>3. se familiariser avec ces derniers et poser un regard critique sur les sources d'information par rapport à la problématique des changements climatiques.</li> </ol> <p><b><u>Contenu</u></b></p> <p>Sciences des changements climatiques, rétroactions du système climatique, cycle du carbone, impact des changements climatiques, montée du niveau de la mer, mesures d'adaptation et mitigation, protocole de Kyoto, sources et moyens de réduction d'émissions de gaz à effet de serre, études régionales de cas, enjeux sociaux, économiques et politiques autour des changements climatiques. Variations climatiques (anciennes variations, réchauffements climatiques planétaires récents, sécheresse et désertification), Facteurs (causes astronomiques, déplacements des continents vers les pôles, crises volcaniques), Rétroaction , Conséquences liées à l'humanité, Conséquences sanitaires</p>
15.	<p><b>GESTION DES DESASTRES ET DU BIO-TERRORISME</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Définir les concepts</li> <li>2. Décrire le rôle du professionnel de la santé environnementale dans la gestion des désastres ou catastrophes</li> <li>3. Appliquer des mesures de prévention de désastre</li> </ol>

	<ol style="list-style-type: none"> <li>Exécuter des plans pour la prévention des catastrophes</li> <li>Evaluer de manière critique les services de gestion des secours</li> <li>Communiquer avec les acteurs dans la gestion des catastrophes</li> </ol> <p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>Définitions des concepts</li> <li>le rôle du professionnel de la santé environnementale</li> <li>Application des mesures de prévention de désastre</li> <li>Exécution des plans pour la prévention des catastrophes</li> <li>Evaluation critique des services de gestion des secours</li> <li>Communication avec les acteurs dans la gestion des catastrophes</li> </ul>
16.	<p><b>PLANIFICATION ET GESTION DE PROJETS</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>Développer des protocoles de projet en santé environnementale</li> <li>Réviser les processus de gestion des projets dans le domaine de la santé</li> <li>Gérer les projets qui interviennent dans le domaine de la santé environnementale</li> </ol> <p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>Développement des protocoles de projet en santé environnementale</li> <li>Révision des processus de gestion des projets dans le domaine de la santé</li> <li>Gestion des projets qui interviennent dans le domaine de la santé environnementale</li> </ul>
17.	<p><b>EPIDEMIOLOGIE</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>Expliquer les facteurs,, la classification, la genèse ou le mode de transmission des maladies</li> <li>Gérer l'information statistique de base (Collecte, Analyse, interprétation et diffusion des résultats)</li> <li>Définir les concepts appropriés utilisés dans le contrôle des maladies</li> <li>Appliquer les cinq niveaux de prévention dans la lutte contre les maladies transmissibles et non transmissible</li> </ol> <p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>les facteurs, la classification, la genèse ou le mode de transmission des maladies</li> <li>Gestion de l'information statistique de base (Collecte, Analyse, interprétation et diffusion des résultats)</li> <li>les concepts appropriés utilisés dans le contrôle des maladies</li> <li>Application des niveaux de prévention dans la lutte contre les maladies transmissibles et non transmissible</li> </ul>
18.	<p><b>SANTE COMMUNAUTAIRE I</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>Définir les concepts de la santé de la population</li> <li>Expliquer les différentes techniques démographiques et leur interprétation</li> <li>Décrire les interventions sanitaires applicables aux différents groupes de la population</li> <li>Identifier, analyser et développer des mesures pour assurer l'égalité des genres (entre les sexes) dans les communautés</li> <li>Appliquer les issues morales dans différentes cultures dans la recherche en</li> </ol>

	<p>matière de santé de la population</p> <p>6. Mettre en pratique les interventions des services de santé et de la population</p> <p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>• les concepts de la santé de la population</li> <li>• les différentes techniques démographiques et leur interprétation</li> <li>• les interventions sanitaires applicables aux différents groupes de la population</li> <li>• Identification, analyse et développement des mesures pour assurer l'égalité des genres (entre les sexes) dans les communautés</li> <li>• les issues morales dans différentes cultures dans la recherche en matière de santé de la population</li> <li>• Mise en pratique des interventions des services de santé et de la population</li> </ul>
19.	<p><b>MALADIES TRANSMISSIBLES ET NON TRANSMISSIBLES</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Expliquer les maladies transmissibles et non transmissibles</li> <li>2. Décrire la pathogénie des divers micro-organismes</li> <li>3. Identifier les groupes à risque</li> <li>4. Décrire les effets des incidents chimiques sur la santé</li> <li>5. Expliquer les maladies tropicales émergentes, réapparues et négligées</li> <li>6. Mettre en place des programmes de gestion des maladies contagieuses et non contagieuses</li> <li>7. Evaluer les aspects toxicologiques des maladies non-contagieuses</li> <li>8. Décrire les termes et les définitions appropriés concernant la recherche sur les manifestations d'intoxication alimentaire et le déclenchement des maladies</li> <li>9. Analyser de manière critique les programmes de gestion des maladies contagieuses et non contagieuses</li> <li>10. Gérer les problèmes liés aux eaux de natation (d'intérieur et extérieurs)</li> </ol> <p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>• les maladies transmissibles et non transmissibles</li> <li>• la pathogénie des divers micro-organismes</li> <li>• Identification des groupes à risque</li> <li>• les effets des incidents chimiques sur la santé</li> <li>• les maladies tropicales émergentes, réapparues et négligées</li> <li>• Mise en place des programmes de gestion des maladies contagieuses et non contagieuses</li> <li>• Evaluation des aspects toxicologiques des maladies non-contagieuses</li> <li>• les termes et les définitions appropriés concernant la recherche sur les manifestations d'intoxication alimentaire et le déclenchement des maladies</li> <li>• Analyse critique des programmes de gestion des maladies contagieuses et non contagieuses</li> <li>• Gestion des problèmes liés aux eaux de natation (d'intérieur et extérieurs)</li> </ul>
20.	<p><b>SYSTEMES DE GESTION DES INFORMATIONS EN MATIERE DE SANTÉ I</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Identifier les éléments du système de soins dans le pays, leur inter relation, le rôle de l'information sanitaire</li> <li>2. Comprendre la nécessité d'adapter le fonctionnement du système d'information sanitaire aux spécificités du système de santé nationale</li> <li>3. Sélectionner l'information pour la prise de décision et l'action</li> </ol>

	<p>4. Interpréter, utiliser et diffuser l'information sanitaire aux différents acteurs</p> <p>5. Intégrer l'information dans le processus de décision en tenant compte des autres déterminants (politiques, sociaux, économiques)</p> <p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>• les éléments du système de santé,</li> <li>• les sources d'information,</li> <li>• les indicateurs (type, qualité et classification),</li> <li>• statistique descriptive et démographie.</li> <li>• collecte des informations : méthodes adaptées en fonction des réalités de terrain et qualité des supports, de la collecte</li> <li>• interprétation de l'information sanitaire : qualité, signification et analyse</li> <li>• utilisation de l'information sanitaire</li> <li>• intégration de l'information dans le processus décisionnel</li> </ul>
21.	<p><b>DENREES ALIMENTAIRES : HYGIENE ET PATHOLOGIE</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Différencier les traits anatomiques importants des différents animaux abattus</li> <li>2. Décrire (y compris le prélèvement et l'analyse) les conditions physiologiques et pathologiques de la maladie</li> <li>3. Identifier, évaluer et communiquer (y compris le prélèvement et l'analyse).</li> <li>4. Décrire le cadre national et international pour les maladies zoonotiques et remarquables et la parasitologie au niveau de la volaille, des poissons, des bovins, des bestiaux,</li> <li>5. Décrire le cadre juridique national et international des conditions pathologiques et physiologiques des maladies zoonotiques et remarquables bovines, bestiales et la volaille</li> <li>6. Analyser de manière critique et appliquer le cadre juridique national et international pour les maladies zoonotiques et remarquables</li> <li>7. Décrire le rôle et la fonction des autres agences impliquées dans l'inspection de viande, la gestion de l'abattage et l'élevage et le bien-être des animaux de consommation</li> <li>8. Décrire les principes de la bonne pratique dans un abattoir</li> <li>9. Appliquer la planification d'abattoir, la construction et la gestion en termes de règlements standards et directives</li> <li>10. Expliquer les conditions et les besoins de la production animale</li> <li>11. Appliquer les principes de l'évaluation des risques à l'inspection de la viande et de la gestion de l'abattage</li> <li>12. Inspecter la viande dans un abattoir d'abattage</li> <li>13. Identifier des facteurs dans la pratique en matière d'abattoir et la législation qui déterminent l'hygiène et la qualité de la viande</li> <li>14. Appliquer, l'hygiène et les procédures conformes aux règlements par rapport à l'abattage des animaux pour la consommation</li> <li>15. Décrire les agents microbiens mis en cause dans l'altération des aliments</li> <li>16. Décrire les maladies liées à la consommation des aliments</li> <li>17. Décrire les règles à respecter en d'hygiène et de sécurité alimentaire</li> <li>18. Appliquer les gestes importants d'hygiène alimentaire</li> <li>19. Appliquer les principes de points critiques de contrôle (HACCP) à la chaîne des denrées d'origine animale et végétale</li> </ol>

	<p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>• les traits anatomiques importants des différents animaux abattus</li> <li>• le prélèvement et l'analyse, les conditions physiologiques et pathologiques, la maladie</li> <li>• Identification, évaluation et communication</li> <li>• le cadre national et international pour les maladies zoonotiques et remarquables et la parasitologie au niveau de la volaille, des poissons, des bovins, des bestiaux,</li> <li>• le cadre juridique national et international des conditions pathologiques et physiologiques des maladies zoonotiques et remarquables bovines, bestiales et la volaille</li> <li>• Analyse critique et application du cadre juridique national et international pour les maladies zoonotiques et remarquables</li> <li>• le rôle et la fonction des autres agences impliquées dans l'inspection de viande, la gestion de l'abattage et l'élevage et le bien-être des animaux de consommation</li> <li>• les principes de la bonne pratique dans un abattoir</li> <li>• la planification d'abattoir, la construction et la gestion en termes de règlements standards et directives</li> <li>• les conditions et les besoins de la production animale</li> <li>• les principes de l'évaluation des risques à l'inspection de la viande et de la gestion de l'abattage</li> <li>• Inspection de la viande dans un abattoir d'abattage</li> <li>• les facteurs dans la pratique en matière d'abattoir et la législation qui déterminent l'hygiène et la qualité de la viande</li> <li>• l'hygiène et les procédures conformes aux règlements par rapport à l'abattage des animaux pour la consommation</li> <li>• Chaîne alimentaire et sécurité alimentaire.</li> <li>• Maladies hydriques, protection et contrôle de leur épidémiologie.</li> <li>• Normes admises en hygiène alimentaire</li> <li>• Autorisation pour la préparation de la nourriture et les industries de vente d'eau de boisson.</li> <li>• Autorisation pour la vente de liqueurs.</li> <li>• Organisation de programme d'atelier pour l'hygiène et la sécurité alimentaire à l'endroit des intervenants dans ce domaine.</li> <li>• Procédure et processus de l'hygiène et de l'inspection des denrées alimentaires.</li> <li>•</li> </ul>
22.	<p><b>SANTE AU TRAVAIL</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Décrire les structures nationales pour le contrôle et la promotion de la santé et la médecine du travail et le rapport avec les structures internationales.</li> <li>2. Fournir une explication sur l'origine de la santé et la médecine du travail.</li> <li>3. Décrire les principes de l'évaluation des risques.</li> <li>4. Décrire les concepts de base de l'évaluation et de l'identification des risques liés au travail</li> <li>5. Evaluer dans le lieu de travail :</li> </ol>

- les facteurs physiques
  - les facteurs biologiques
  - les facteurs chimiques.
  - les facteurs psychologiques
  - les facteurs ergonomiques
6. Décrire les principes de l'inspection et l'audit
  7. Evaluer les points suivants en termes de législation et normes internationales pour l'évaluation et l'échantillonnage des risques.
    - les facteurs physiques
    - les facteurs biologiques
    - les facteurs chimiques
    - les facteurs psychologiques
    - les facteurs ergonomiques
  8. Evaluer de manière critique les sujets d'ordre éthique dans la conception de santé et sécurité au travail
  9. Evaluer de manière critique les programmes de gestion en termes de législation nationale et internationale et normes
  10. Gérer la santé du travail et les risques professionnels qui résultent des facteurs suivants dans le lieu de travail :
    - les Facteurs physiques
    - les facteurs chimiques
    - les facteurs ergonomiques
    - les facteurs biologiques
    - les facteurs psychologiques
    - les problèmes de sécurité.
  11. Evaluer de manière critique les documents et les systèmes d'inspection/audit pour une gestion efficace des programmes d'OHS.
  12. Concevoir un plan de secours pour gérer les accidents, les incidents et les événements catastrophiques.
  13. Prendre une mesure appropriée en ce qui concerne les problèmes d'éthique en santé et sécurité au travail.

### **Contenu**

- Les structures nationales pour le contrôle et la promotion de la santé et médecine du travail et le rapport avec les structures internationales.
- l'origine de la santé au travail.
- les principes de l'évaluation des risques.
- les concepts de base de l'évaluation et de l'identification des risques
- Evaluation des risques sanitaires dans le lieu de travail
- les principes de l'inspection et l'audit
- législation et normes internationales pour l'évaluation et l'échantillonnage des risques.
- Evaluation critique des sujets d'ordre éthique dans la conception de santé et sécurité au travail
- Evaluation critique des programmes de gestion en termes de législation nationale et internationale et normes
- Gestion de la santé au travail et des risques professionnels
- Evaluation critique des documents et des systèmes d'inspection/audit pour une gestion efficace des programmes d'OHS.
- Conception d'un plan de secours pour gérer les accidents, les incidents et

	<p>les événements catastrophiques.</p> <ul style="list-style-type: none"> <li>• Mesures appropriées en ce qui concerne les problèmes d'éthique en santé et sécurité au travail.</li> <li>• Droit du travail</li> </ul>
23.	<p><b>VENTILATION DES ETABLISSEMENTS PUBLICS ET PRIVES</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Définir les concepts de ventilation.</li> <li>2. Décrire les différents types de ventilations</li> <li>3. Exécuter les calculs concernant la ventilation pour l'évaluation et la résolution des problèmes liés aux systèmes de ventilation.</li> <li>4. Intégrer l'information sur des systèmes de ventilation d'un lieu de travail spécifique dans l'évaluation et la gestion des risques</li> <li>5. Discuter les composants de divers types des systèmes de ventilation et d'épurateurs d'air.</li> </ol> <p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>• les concepts de ventilation.</li> <li>• les différents types de ventilations</li> <li>• les calculs concernant la ventilation pour l'évaluation et la résolution des problèmes liés aux systèmes de ventilation.</li> <li>• Intégration de l'information sur des systèmes de ventilation d'un lieu de travail spécifique dans l'évaluation et la gestion des risques</li> <li>• les composants de divers types des systèmes de ventilation et d'épurateurs d'air</li> </ul>
24.	<p><b>LUTTE CONTRE LES VECTEURS DE MALADIES</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Décrire les vecteurs des maladies liées à la santé environnementale</li> <li>2. Décrire le bionomique en termes de leur physiologie, cycle de vie, distribution,</li> <li>3. Utiliser la recherche pour la prévention et le contrôle des maladies transmissibles</li> <li>4. Mener des activités d'intervention contre les vecteurs de maladies</li> </ol> <p><b><u>Contenu</u></b></p> <ol style="list-style-type: none"> <li>a. Historique des maladies à vecteurs</li> <li>b. Caractéristiques de la transmission vectorielle d'une maladie</li> <li>c. Le rôle du vecteur dans la transmission vectorielle</li> <li>d. Les principales maladies à vecteurs</li> <li>e. Stratégies de lutte contre les maladies à vecteurs</li> <li>f. Maladies à vecteurs et changements climatiques</li> <li>g. les vecteurs des maladies liées à la santé environnementale</li> <li>h. le bionomique en termes de leur physiologie, cycle de vie, distribution,</li> <li>i. la recherche pour la prévention et le contrôle des maladies transmissibles</li> <li>j. activités d'intervention contre les rongeurs et les vecteurs</li> <li>k. Définition d'agents pathogènes (Bactérie, champignons, parasite) et de vecteurs importants en santé publique</li> <li>l. Exemples d'agents pathogènes et de vecteurs</li> <li>m. Comparaison des méthodes de lutte contre le parasite/vecteur c'est-à-dire biologique, physique, chimique, génétique aux mesures de contrôle de l'environnement (lutte intégrée).</li> </ol>

	<p>n. Exemples de produits chimiques utilisés dans la lutte contre les parasites de la santé publique.</p> <p>o. Implications sanitaires de certains produits chimiques utilisés dans la lutte contre les parasites</p>
25.	<p><b>EDUCATION ET PROMOTION DE LA SANTÉ ENVIRONNEMENTALE</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Expliquer les concepts de la promotion et l'éducation de la santé</li> <li>2. Décrire les principes de la promotion de la santé</li> <li>3. Evaluer et analyser de manière critique les politiques nationales et internationales en matière de soins de santé</li> <li>4. Analyser de manière critique et appliquer les modèles de promotion de la santé</li> <li>5. Faire une analyse des besoins pour déterminer les conditions de la promotion de la santé</li> <li>6. Initier la démarche et les stratégies privilégiées d'éducation relative à l'environnement</li> </ol> <p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>• Concepts de la promotion et l'éducation de la santé</li> <li>• Concepts d'éducation relative à l'environnement, éco responsabilité</li> <li>• objectifs et activités de l'éducation relative à l'environnement</li> <li>• Principes de la promotion de la santé</li> <li>• Evaluation et analyse critique des politiques nationales et internationales en matière de soins de santé</li> <li>• Analyse critique et application des modèles de promotion de la santé</li> <li>• analyse des besoins pour déterminer les conditions de la promotion de la santé</li> <li>• acteurs de l'éducation relative à l'environnement</li> <li>• démarche (l'exploration critique du milieu, la résolution collective d'un problème local et le développement d'un projet communautaire) et stratégies privilégiées d'éducation relative à l'environnement</li> </ul>
26.	<p><b>SYSTEMES DE GESTION DES INFORMATIONS EN MATIERE DE SANTE II</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Définir l'information en matière de santé, d'environnement et les systèmes de gestion de ces informations</li> <li>2. Décrire les principes de gestion de l'information en matière de santé environnementale</li> <li>3. Décrire le cycle de gestion en matière de santé environnementale</li> <li>4. Développer et montrer les meilleures pratiques dans la gestion institutionnelle</li> <li>5. Développer les outils efficaces de collecte de données</li> <li>6. Développer, mettre en application et évaluer les composants de HIMS en matière de santé environnementale</li> <li>7. Analyser et interpréter les données</li> <li>8. Utiliser les données pour une planification efficace des activités de santé environnementale</li> </ol> <p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>• Les concepts de base du Système d'Information Environnementale, infrastructure physique et logique, stockage des données, etc.</li> <li>• Analyse et conception de système d'informations</li> </ul>



	<ul style="list-style-type: none"> <li>• Approche méthodologique pour l'urbanisme des systèmes d'information</li> <li>• système d'information environnemental</li> <li>• L'information géographique (système d'information géographique) et les types de données spatiales, système de gestion des données, la cartographie d'un territoire, acquisition et préparation des données spatiales, initiation à ILWIS et autres logiciels adaptés, analyse spatiale avec ILWIS : opération de retrait, de reclassification et de mesure</li> <li>• Sensibilisation à la sécurité des systèmes d'information de routine</li> </ul>
27.	<p><b>SANTE COMMUNAUTAIRE II</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Expliquer les concepts et les stratégies de la santé communautaire</li> <li>2. Poser un diagnostic communautaire</li> <li>3. analyser la situation sanitaire de la communauté,</li> <li>4. identifier le problème, choisir les priorités,</li> <li>5. définir les objectifs et activités, mobiliser les ressources pour améliorer la situation,</li> <li>6. organiser et conduire l'action,</li> <li>7. Participer à l'organisation communautaire</li> <li>8. Développer un programme à base communautaire</li> <li>9. Suivre et évaluer les activités de santé communautaire</li> </ol> <p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>• les concepts de santé, de santé publique, de soins de santé primaire (SSP), de santé communautaire,</li> <li>• Les sciences humaines et la santé</li> <li>• les stratégies de la sante communautaire</li> <li>• diagnostic communautaire</li> <li>• stratégies de participation communautaire</li> <li>• structures de participation communautaire</li> <li>• développement d'un programme à base communautaire</li> <li>• Suivi et évaluation des activités de santé communautaire</li> </ul>
28.	<p><b>GESTION DES DECHETS</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Expliquer les principes de la biodégradation des déchets</li> <li>2. Définir les terminologies concernant la gestion des déchets.</li> <li>3. Expliquer les procédures, principes et les pratiques exigés de la collecte au traitement des déchets</li> <li>4. Evaluer les options de traitement telles que l'incinération, pyrolyse, l'autoclave et compostage.</li> <li>5. Passer en revue de manière critique les processus liés aux dispositions légales nationale et internationale de gestion des déchets</li> <li>6. Elaborer des stratégies innovatrices réalisables de minimisation de déchets pour les communautés rurales</li> </ol> <p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>• les principes de la biodégradation des déchets</li> <li>• la terminologie concernant la gestion des déchets.</li> <li>• les procédures, principes et les pratiques exigés de la collecte au traitement des déchets</li> </ul>

	<ul style="list-style-type: none"> <li>• Evaluation des options de traitement telles que l'incinération, pyrolyse, l'autoclave et compostage.</li> <li>• les processus liés aux dispositions légales nationale et internationale de gestion des déchets</li> <li>• stratégies innovatrices réalisables de minimisation de déchets pour les communautés rurales</li> </ul> <p><b>Options pratiques simples de la gestion des déchets liquides et solides</b></p> <ul style="list-style-type: none"> <li>• Définition de concepts</li> <li>• Classification des déchets ;</li> <li>• Caractéristiques des déchets ;</li> <li>• Méthode de disposition de déchets solides particulièrement pour l'incinération et la mise en terre.</li> <li>• Gestion des déchets de soins de santé</li> <li>• Nouveaux concepts dans la gestion des déchets solides c'est-à-dire le devoir de soin de réutilisation, de recyclage, et rétablissement.</li> <li>• Collecte et disposition des eaux d'égout</li> <li>• Définition des eaux usées et excréta</li> <li>• Exemples d'eaux usées</li> <li>• Composants et constituants des déchets liquides</li> <li>• Méthodes de gestion des eaux usées et des excréta</li> <li>• Gestion des boues de vidange</li> </ul>
29.	<p><b>LOIS EN SANTÉ ENVIRONNEMENTALE ET LES PROCESSUS LEGAUX</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Décrire la hiérarchie et les processus de formulation des conventions, lois et règlements relevant du droit de l'environnement et de la santé environnementale</li> <li>2. identifier les principaux instruments légaux internationaux et nationaux relatifs à l'environnement et à la santé environnementale</li> <li>3. Interpréter le cadre national et international légal (y compris protocoles et conventions) pour la communauté</li> <li>4. Décrire le rôle de l'EHO et d'autres professionnels impliqués dans l'application de la loi</li> <li>5. Décrire les processus légaux en matière de santé environnementale</li> </ol> <p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>• la hiérarchie et les processus de formulation des conventions, lois et règlements relevant du droit de l'environnement et de la santé environnementale</li> <li>• les principaux instruments légaux internationaux (protocole de Kyoto, convention de bale, convention de Stockholm, convention de Rotterdam, etc. ) et nationaux relatifs à l'environnement et à la santé environnementale</li> <li>• Interprétation du cadre national et international légal pour la communauté</li> <li>• le rôle de l'EHO et d'autres professionnels impliqués dans l'application de la loi</li> <li>• les processus légaux en matière de santé environnementale</li> </ul>

30.	<p><b>GESTION DE L’AIR</b></p> <p><b><u>Objectifs d’apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Appliquer les principes et les techniques de contrôle et d’échantillonnage</li> <li>2. Evaluer les options respectives relatives à l’évaluation de la pollution et du contrôle de l’air</li> <li>3. Evaluer la radiation et la radioactivité dans le cadre de la pollution de l’environnement</li> <li>4. Interpréter les mesures et faire des contrôles et rapport par rapport aux plaintes relatives aux nuisances (bruits) en matière d’environnement</li> <li>5. Evaluer l’impact (évaluation des incidences) de la pollution atmosphérique sur les humains, animaux, les plantes</li> <li>6. Réviser de manière critique les processus liés aux dispositions légales nationale et internationale de la gestion de la qualité de l’air</li> <li>7. Evaluer et communiquer les inventaires d’émission</li> </ol> <p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>• les principes et les techniques de contrôle et d’échantillonnage</li> <li>• les options respectives relatives à l’évaluation de la pollution et du contrôle de l’air</li> <li>• Evaluation de la radiation et la radioactivité dans le cadre de la pollution de l’environnement</li> <li>• l’interprétation de mesures et des contrôles et rapports par rapport aux plaintes relatives aux nuisances (bruits) en matière d’environnement</li> <li>• Evaluation de l’impact (évaluation des incidences) de la pollution atmosphérique sur les humains, animaux, les plantes</li> <li>• les processus liés aux dispositions légales nationale et internationale de la gestion de la qualité de l’air</li> <li>• Evaluation et communication des inventaires d’émission</li> </ul>
31.	<p><b>RESSOURCES EN EAU ET LA GESTION DE LA QUALITE</b></p> <p><b><u>Objectifs d’apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Décrire la gestion de la qualité de l’eau</li> <li>2. Décrire la différence entre les caractéristiques chimiques, physiques, biologiques de l’eau</li> <li>3. Faire la différence entre l’eau de surface, la purification de l’eau potable et le traitement des eaux usées</li> <li>4. Décrire l’importance de l’eau</li> <li>5. Identifier et décrire la réglementation nationale et internationale par rapport à la sécurité de l’eau</li> <li>6. Décrire comment valider les stratégies appropriées d’adduction d’eau et le traitement de l’eau,</li> <li>7. Décrire le processus de traitement des eaux de piscines.</li> <li>8. Développer et mettre en application les plans des systèmes de d’alimentation en eau</li> <li>9. Comprendre les diverses méthodes d’hygiène et de gestion de l’eau au niveau des ménages et communautés</li> <li>10. Comprendre les critères et les normes internationaux de la gestion de qualité de l’eau</li> <li>11. Appliquer les Procédures et techniques d’échantillonnage de l’eau</li> </ol>

	<p>12. Appliquer les stratégies appropriées de surveillance de la qualité de l'eau de boisson</p> <p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>• La gestion intégrée des ressources en eau</li> <li>• la gestion de la qualité de l'eau</li> <li>• les caractéristiques chimiques, physiques, biologiques de l'eau</li> <li>• la différence entre l'eau de surface, la purification de l'eau potable et le traitement des eaux usées</li> <li>• l'importance de l'eau</li> <li>• la réglementation nationale et internationale par rapport à la sécurité de l'eau</li> <li>• validation des stratégies appropriées d'adduction d'eau et le traitement de l'eau,</li> <li>• le traitement de l'effluent, les eaux de piscines</li> <li>• les plans des systèmes d'alimentation en eau</li> <li>• les diverses méthodes d'hygiène et de gestion de l'eau au niveau des ménages et communautés</li> <li>• les critères et les normes internationaux de la gestion de qualité de l'eau</li> <li>• Procédures et techniques d'échantillonnage de l'eau</li> <li>• Epidémiologie des maladies hydriques ou des maladies liées à l'eau.</li> <li>• Stratégies appropriées de surveillance de la qualité de l'eau de boisson</li> </ul>
32.	<p><b>LUTTE CONTRE LA POLLUTION</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Identifier, décrire et appliquer les conseils et les codes spécifiques locaux, nationaux et internationaux pour la lutte contre la pollution.</li> <li>2. Appliquer les procédures pour la gestion de tout type de déchets c'est-à-dire les déchets de soins, les déchets des ménages, les déchets industriels, les déchets solides, liquides et les déchets dangereux</li> <li>3. Expliquer les principes et l'importance de l'hygiène personnelle et environnementale dans la lutte contre la pollution</li> <li>4. Décrire les principes, les pratiques et les technologies appropriées de l'hygiène</li> <li>5. Expliquer l'approche d'équipe multidisciplinaire à l'hygiène.</li> <li>6. Décrire les systèmes de contrôle de la pollution concernant une communauté spécifique</li> <li>7. Décrire des approches participatives à la gestion d'hygiène au niveau des ménages et communautés</li> <li>8. Décrire le processus de la biodégradation dans l'environnement (air, eau et terre)</li> <li>9. Appliquer les technologies appropriées de prévention de la pollution</li> </ol> <p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>• L'analyse du cycle de vie</li> <li>• les conseils et les codes spécifiques locaux, nationaux et internationaux pour la lutte contre la pollution.</li> <li>• les procédures de gestion des divers types de déchets c'est-à-dire les déchets de soins, les déchets des ménages, les déchets industriels, les déchets solides, liquides et les déchets dangereux</li> <li>• les principes et l'importance de l'hygiène personnelle et environnementale dans la lutte contre la pollution</li> <li>• les principes, les pratiques et les technologies appropriées de l'hygiène</li> <li>• l'approche d'équipe multidisciplinaire à l'hygiène.</li> <li>• systèmes de contrôle de la pollution concernant une communauté spécifique</li> </ul>

	<ul style="list-style-type: none"> <li>• approches participatives à la gestion d'hygiène au niveau des ménages et communautés</li> <li>• le processus de la biodégradation dans l'environnement (air, eau et terre)</li> <li>• Les technologies de prévention de la pollution</li> </ul>
33.	<p><b>EDUCATION ET PROMOTION DE LA SANTÉ</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Définir le concept d'éducation et de la promotion de la santé</li> <li>2. Expliquer les concepts d'éducation et de promotion de la santé dans le cadre de la lutte contre la pollution.</li> <li>3. Analyser les politiques nationales et internationales sur la protection de l'environnement et la durabilité</li> <li>4. Appliquer les méthodes participatives dans l'éducation sanitaire</li> </ol> <p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>• les concepts d'éducation et de promotion de la santé</li> <li>• les concepts d'éducation et de promotion de la santé dans le cadre de la lutte contre la pollution.</li> <li>• les politiques nationales et internationales sur la protection de l'environnement et la durabilité</li> <li>• les stratégies de la communication (IEC) dans l'éducation sanitaire</li> <li>• l'importance des méthodes participatives</li> <li>• La communication au service de la santé publique</li> <li>• Quelques principes adoptés par la communication en santé publique</li> <li>• Rôle et limites de la publicité</li> <li>• La méthodologie d'élaboration d'une campagne d'éducation pour la promotion de la santé</li> </ul>
34.	<p><b>ECO-TOXICOLOGIE</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Définir les concepts</li> <li>2. Déterminer l'impact des substances toxiques sur l'environnement</li> <li>3. Développer des mesures de contrôle de l'impact des toxines environnementales sur l'environnement.</li> <li>4. Expliquer les définitions et les équations concernant la toxicologie et le rapport de réponse à dose donnée.</li> <li>5. Classifiez les effets toxiques en termes de temps de réaction, les irritants, l'effet sur le corps.</li> <li>6. Expliquer le concept d'évaluation de temps.</li> <li>7. Définir le concept de prévention des risques professionnels</li> <li>8. Rapporter ces aspects à la législation et aux normes nationales et internationales.</li> <li>9. Evaluer les facteurs de risques professionnels en utilisant les principes d'évaluation de temps.</li> <li>10. Expliquer l'effet de diverses substances toxiques sur le corps.</li> <li>11. Intégrer l'information toxicologique dans les évaluations des risques et des plans de gestion.</li> </ol> <p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>• les concepts clés de l'éco - toxicologie</li> <li>• l'impact des substances toxiques sur l'environnement</li> </ul>

	<ul style="list-style-type: none"> <li>• mesures de contrôle de l'impact des toxines environnementales sur l'environnement.</li> <li>• les définitions et les équations concernant la toxicologie et le rapport de réponse à dose donnée.</li> <li>• les effets toxiques en termes de temps de réaction, les irritants, effet sur le corps.</li> <li>• le concept d'évaluation de temps.</li> <li>• le concept de prévention des risques professionnels</li> <li>• la législation et les normes nationales et l'internationales.</li> <li>• les facteurs de risques professionnels en utilisant les principes d'évaluation de temps.</li> <li>• l'effet de diverses substances toxiques sur le corps.</li> <li>• l'information toxicologique dans les évaluations des risques et des plans de gestion.</li> </ul>
35.	<p><b>GESTION DES CADAVRES ET ÉTABLISSEMENTS MORTUAIRES</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Appliquer les méthodes de gestion des cadavres et établissements mortuaires en toute sécurité</li> <li>2. Evaluer les équipements pour la conservation et le transport des cadavres</li> <li>3. Décrire les méthodes et les pratiques par lesquelles une exhumation peut être faite</li> <li>4. Décrire la gestion des cadavres non-revendiqués</li> <li>5. Décrire les méthodes de transport des cadavres selon les lois nationales et internationales.</li> </ol> <p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>• les méthodes de gestion des cadavres et établissements mortuaires en toute sécurité</li> <li>• les équipements pour la conservation et le transport des cadavres</li> <li>• les méthodes et les pratiques d'exhumation</li> <li>• la gestion des cadavres non-revendiqués</li> <li>• les méthodes de transport des cadavres selon les lois nationales et internationales.</li> </ul>
36.	<p><b>INSPECTION SANITAIRE DES LIEUX</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Définir les concepts de base</li> <li>2. Déterminer les mesures à prendre avant le choix de l'emplacement d'un logement et la construction d'un bâtiment.</li> <li>3. Appliquer les Politiques, règlements et lois par rapport au logement et à l'hygiène des lieux du pays.</li> <li>4. Appliquer les procédures d'inspection des lieux et de la réduction des nuisances</li> </ol> <p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>• Définition et différenciation entre maison idéale et habitation</li> <li>• Concept et conditions d'une maison idéale</li> <li>• Précaution à prendre avant le choix de l'emplacement d'un logement et la construction d'un bâtiment.</li> <li>• Procédures d'inspection des lieux et de la réduction des nuisances</li> </ul>

	<ul style="list-style-type: none"> <li>• Politiques, règlements et lois par rapport au logement et à l'hygiène des lieux du pays.</li> <li>• Inspection sanitaire des lieux</li> </ul>
37.	<p><b>HYGIENE HOSPITALIERE</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Définir les concepts</li> <li>2. Expliquer l'intérêt de l'hygiène hospitalière ;</li> <li>3. Développer les mesures de lutte contre les infections hospitalières</li> </ol> <p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>• Définitions de concepts</li> <li>• Intérêt de l'hygiène hospitalière ;</li> <li>• Mesures de lutte contre les infections hospitalières</li> </ul>
38.	<p><b>LOGEMENT</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Expliquer le rapport entre le logement et la santé</li> <li>2. Décrire le rôle d'un d'un professionnel de la santé environnementale en matière de logement</li> <li>3. Expliquer le concept du logement à coût bas</li> <li>4. Décrire les conditions spéciales en matière de lieu de résidence</li> <li>5. Développer les messages éducatifs</li> <li>6. Communiquer les messages d'E I C (l'information, Education et communication de) concernant le bon logement</li> <li>7. Evaluer les risques causés à la santé par la construction</li> <li>8. Analyser l'information d'une évaluation des risques du logement</li> <li>9. Appliquer des interventions efficaces pour un meilleur logement.</li> <li>10. Rendre compte de l'état de logement comme stipulé par la législation et les règlements appropriés</li> </ol> <p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>• Rapport entre le logement et la santé</li> <li>• Rôle d'un d'un professionnel de la santé environnementale en matière de logement</li> <li>• Concept du logement à coût bas</li> <li>• Conditions spéciales en matière de lieu de résidence</li> <li>• L'analyse de l'air intérieur et des diversités de pollution : agents physiques et contaminants chimiques ou microbiologiques liés aux bâtiments, aux équipements, à l'environnement extérieur immédiat et au comportement des occupants, aux produits de construction, d'ameublement, d'entretien, équipement de chauffage et de climatisation...</li> <li>• Messages éducatifs</li> <li>• Communication des messages d'E I C (l'information, Education et communication de) concernant le bon logement</li> <li>• Evaluation des risques causés à la santé par la construction</li> <li>• Analyse de l'information d'une évaluation des risques du logement</li> <li>• Interventions efficaces pour un meilleur logement.</li> <li>• Compte - rendu de l'état de logement comme stipulé par la législation et les règlements appropriés</li> </ul>

39.	<p><b>ETHIQUE ET CODE DE DEONTOLOGIE</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Définir les concepts de base</li> <li>2. Décrire les normes et principes de déontologie en santé environnementale</li> <li>3. Expliquer l'intégrité scientifique et professionnelle et les conflits d'intérêt</li> <li>4. Décrire l'Histoire et l'organisation de la santé environnementale</li> <li>5. Appliquer les principes éthiques liés à la santé environnementale</li> </ol> <p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>• Définition de la santé environnementale</li> <li>• Définition de l'éthique et des concepts de la santé environnementale ;</li> <li>• Normes et principes de déontologie en santé environnementale ;</li> <li>• Intégrité scientifique et professionnelle et les conflits d'intérêt ;</li> <li>• Histoire et évolution de la santé environnementale</li> <li>• Evolution de la protection en santé environnementale</li> <li>• Besoin de formation et d'admission du cadre professionnel moyen et leur importance dans la profession de la santé environnementale.</li> <li>• Éthique professionnelle exigée du cadre professionnel par rapport à son comportement, sa moralité, son attitude envers le public son habillage, son respect de la hiérarchie.</li> <li>• Ethiques de la profession de santé environnementale avec un accent plus particulier sur l'enregistrement, le permis et la participation au programme aussi bien que l'action d'éviter des vices négatifs tels que le retard au service, l'absentéisme, et l'abus d'alcool pendant les heures de service etc.</li> </ul>
40.	<p><b>REDACTION ADMINISTRATIVE</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Rédiger les différents supports de communication administrative (rapports, courriers, compte-rendu, procès verbal....)</li> </ol> <p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>• Rédaction des différents supports de communication administrative (rapports, courriers, compte-rendu, procès verbal....)</li> </ul>
41.	<p><b>ETUDE D'IMPACT ENVIRONNEMENTAL</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Décrire les diverses terminologies en EIA</li> <li>2. Identifier les acteurs impliqués dans les processus d'EIA</li> <li>3. Identifier les différents types de développements auxquels l'EAI est impliqué</li> <li>4. Comprendre comment concevoir, conduire, évaluer et interpréter les évaluations des problèmes de développement</li> <li>5. Indiquer les méthodes pour déterminer les problèmes liés au développement des projets</li> <li>6. Comprendre comment estimer les futurs problèmes d'un développement</li> <li>7. Comprendre comment évaluer ou mesurer les problèmes de santé d'un développement</li> <li>8. Développer et évaluer des systèmes de gestion de l'environnement par exemple OIN 14001</li> <li>9. Décrire les principes et les processus pour mener des audits dans le domaine de l'environnement</li> </ol>



	<p>10. . Décrire comment rédiger un audit d'E.I.A. et le rapport d'évaluation</p> <p>11. Evaluer le rapport interne entre les différents composants de l'environnement et leurs conséquences relatives</p> <p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>• les diverses terminologies en EIA</li> <li>• les acteurs impliqués dans les processus d'EIA</li> <li>• les différents types de développements auxquels l'EAI est impliqué</li> <li>• conception, conduite, évaluation et interprétation des évaluations des problèmes de développement</li> <li>• les méthodes pour déterminer les problèmes liés au développement des projets</li> <li>• estimation des futurs problèmes d'un développement</li> <li>• évaluation ou mesure des problèmes de santé d'un développement</li> <li>• les systèmes de gestion de l'environnement par exemple OIN 14001</li> <li>• les principes et les processus pour mener des audits dans le domaine de l'environnement</li> <li>• rédaction d'un audit d'E.I.E. et le rapport d'évaluation</li> <li>• le rapport interne entre les différents composants de l'environnement et leurs conséquences relatives</li> <li>• Outils d'évaluation environnementale, les caractéristiques de l'EIE, procédure de réalisation de l'EIE, procédure administrative de l'EIE, comment faire une EIE, les outils d'évaluation d'impact, démarche méthodologique d'évaluation des impacts environnementaux, outils d'évaluation d'impact, fiche d'impact, réalisation de la fiche de mesure d'impact, plan de gestion environnemental.</li> </ul>
42.	<p><b>GESTION DE LA SECURITE</b></p> <p><b><u>Objectifs d'apprentissage</u></b></p> <ol style="list-style-type: none"> <li>1. Définir des concepts concernant la sécurité.</li> <li>2. Expliquer les théories de prévention des accidents.</li> <li>3. Distinguer le risque du danger</li> <li>4. Evaluer les risques sanitaires liés aux lieux de travail et dans population générale</li> <li>5. Concevoir un programme de gestion des risques en matière de sécurité.</li> <li>6. Evaluer de manière critique les programmes de gestion en termes de législation nationale et internationale et les normes.</li> <li>7. Comparer les risques professionnels et la médecine du travail dans le lieu de travail.</li> <li>8. Développer des actions de sécurité sanitaire</li> </ol> <p><b><u>Contenu</u></b></p> <ul style="list-style-type: none"> <li>• les concepts concernant la sécurité.</li> <li>• les théories de prévention des accidents.</li> <li>• le risque et le danger</li> <li>• Evaluation des risques sanitaires liés aux lieux de travail et dans la population générale.</li> <li>• Conception d'un programme de gestion des risques en matière de sécurité.</li> <li>• Evaluation critique des programmes de gestion en termes de législation nationale et internationale et les normes.</li> <li>• Comparaison des risques professionnels et la médecine du travail dans le lieu de travail.</li> <li>• Actions pour la sécurité sanitaire</li> </ul>

43.	<b>BIOSTATISTIQUE ET METHODOLOGIE DE RECHERCHE</b>  <u><b>Objectifs d'apprentissage</b></u> <ol style="list-style-type: none"> <li>1. Définir les concepts</li> <li>2. Donner l'historique de la bio statistique</li> <li>3. Appliquer les principes généraux des statistiques dans les systèmes de gestion de service de santé</li> <li>4. Développer les protocoles de recherche et les outils de collecte de données</li> <li>5. Réviser les rapports de recherches scientifiques en santé environnementale</li> <li>6. Evaluer les besoins de la communauté et les soumettre aux acteurs du domaine</li> <li>7. Entreprendre la recherche pour une dissertation scientifique</li> </ol> <u><b>Contenu</b></u> <ul style="list-style-type: none"> <li>• les concepts</li> <li>• l'historique de la bio statistique</li> <li>• Fondements conceptuels des méthodes statistiques</li> <li>• Introduction aux techniques statistiques élémentaire (statistiques descriptives et exploratoires, calcul des probabilités, inférence statistique)</li> <li>• les principes généraux des statistiques dans les systèmes de gestion de service de santé</li> <li>• les bases de conceptualisation d'un travail de recherche</li> <li>• les protocoles de recherche et les outils de collecte de données</li> <li>• les rapports de recherches scientifiques en santé environnementale</li> <li>• Evaluation des besoins de la communauté et les soumettre aux acteurs du domaine</li> <li>• Etapes de la recherche pour une dissertation scientifique</li> </ul>
44.	<b>STAGE EN GENIE CIVIL : 1 MOIS</b>
45.	<b>STAGE D'HYGIENE DE L'ENVIRONNEMENT : 1 MOIS</b>
46.	<b>STAGE PRATIQUE D'APPLICATION : 3 MOIS</b>
47.	<b>REDACTION ET PRESENTATION DU RAPPORT DU MEMOIRE</b>

## **ANNEXE : LES MODALITES D'EVALUATION SELON LE SYSTEME LMD**

### **I. EVALUATION DES APTITUDES**

Les aptitudes et les acquisitions de connaissances sont appréciées semestriellement soit par un contrôle continu et régulier, soit par un examen final soit par les deux modes combinés.

#### **Le contrôle continu**

- Il porte sur des questions ponctuelles pour sonder le niveau de compréhension de l'étudiant.
- Il concerne des questions de cours, des exercices, les TP, le travail personnel.
- Il est réalisé en TD/TP sur une durée limitée (généralement 20 minutes).
- Chacune de ces évaluations intervient dans la note finale de la matière selon une pondération affichée au début du semestre.

#### **L'examen de fin de semestre / rattrapage**

Il porte selon les matières sur les connaissances acquises durant le semestre. Sa durée est fixée par l'établissement.

### **II. EVALUATION DE LA MATIERE**

- La note d'une matière comprend les notes du contrôle continu et les notes de l'examen ;
- Une matière est acquise si la note obtenue matière est égale ou supérieure à 10/20.

### **III. EVALUATION DE L'UE**

- L'UE est définitivement acquise pour tout étudiant ayant acquis toutes les matières qui la composent ;
- L'UE peut aussi être acquise par compensation si la moyenne de l'ensemble des notes obtenues dans les matières qui la constituent, pondérées de leurs coefficients respectifs, est égale ou supérieure à 10/20

### **IV.EVALUATION DU SEMESTRE**

- Le semestre est acquis pour tout étudiant ayant obtenu l'ensemble des UE qui le composent
- Le semestre peut également être acquis par compensation entre les différentes UE qui le composent, pondérées de leurs coefficients respectifs. Le semestre est alors acquis si la moyenne compensée est égale ou supérieure à 10/20.

### **V. EVALUATION DE L'ANNEE**

L'année académique est acquise si les deux semestres qui la composent sont acquis. L'année académique peut aussi être acquise par compensation. Elle permet l'acquisition de l'année (L1, L2 ou L3) par le calcul de la moyenne des notes des UE qui composent cette année, affectées de leurs coefficients respectifs. Si cette moyenne est supérieure ou égale à 10/20, l'étudiant obtient les 60 crédits de l'année.

#### **Session de rattrapage**

Tout étudiant non admis à la première session, se présente à la session de rattrapage pour les épreuves des matières non acquises des Unités d'Enseignement non acquises des semestres non acquis.

La note finale retenue pour la matière sera la meilleure des moyennes entre la première session et la session de rattrapage. Tout étudiant n'ayant pas obtenu une moyenne compensée supérieure ou égale à 10/20 après la session de rattrapage, conserve les crédits des UE et des matières où il a obtenu une moyenne supérieure ou égale à 10/20.

### **Organisation du rattrapage de l'année en cours**

Le rattrapage des dettes antérieures a été déjà abordé précédemment. Il s'agit ici des rattrapages de l'année en cours (Semestre 1 : S1 et Semestre 2 : S2). Il faut:

- Réaliser le rattrapage du S1 à la fin du S1 et celui du S2 à la fin du S2, ou
- Organiser le rattrapage des deux semestres à la fin du S2.

Le choix de l'une ou de l'autre possibilité implique de définir une stratégie connue de tous au départ de l'année universitaire.

## **VI. PROGRESSION DANS LES ETUDES**

### **❖ Passage du L1 au L2**

#### ***CAS 1 : CAPITALISATION***

L'étudiant est admis en deuxième année s'il a validé les deux semestres de la 1ère année du cycle de formation.

#### ***CAS 2 : COMPENSATION***

L'étudiant peut être autorisé à poursuivre les enseignements de la 2ème Année du cycle de formation s'il valide au moins 50% des crédits de la 1ère Année, dont au moins 1/3 dans un semestre, Il est alors tenu de se réinscrire aux matières non acquises des UE non acquises de la 1<sup>ère</sup> année

### **❖ Passage du L2 au L3**

#### ***CAS 1 : CAPITALISATION***

L'étudiant est admis en 3ème année s'il a validé les quatre premiers semestres du cycle de formation.

#### ***CAS 2 : COMPENSATION***

La progression à la 3ème Année peut être autorisée pour tout étudiant justifiant au moins 90 % des crédits des 2 premières années, et ayant validé toutes les UE fondamentale indispensables à la poursuite des études en spécialité. Dans ce cas, l'étudiant est tenu de se réinscrire aux matières non acquises des UE non acquises des quatre premiers semestres

## **VII. EXAMEN DE CERTIFICATION.**

Il se fait en fin de formation (à la fin de la troisième année). L'obtention du diplôme est conditionnée par :

- L'acquisition des crédits nécessaires pour chacun des six (06) semestres.
- L'acquisition de la moyenne de 10/20. Toutefois, l'échelle de notation peut être de 0 à 100%.

## **APPRECIATION**

[0 à 10[= Echec à l'examen

[10 à 12[= Admis avec la mention minimale (passable)

[12 à 14[= Admis avec la mention assez bien

[14 à 16[= Admis avec la mention bien

[16 à 20] = Admis avec la mention très bien.



**CURRICULO HARMONIZADO DE FORMAÇÃO**  
**LICENCIATURA EM SAÚDE AMBIENTAL**  
**FORMAÇÃO DOS QUADROS EM SAÚDE AMBIENTAL**



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## SIGLAS E ACRÓNIMOS

<b>AMS</b>	: Assembleia dos Ministros da Saúde
<b>BAC</b>	: (12ºano de escolaridade)
<b>CEPC</b>	: Certificado de Estudos do Primeiro Ciclo
<b>CEDEAO</b>	: Comunidade Económica dos Estados da África Ocidental
<b>QSA</b>	: Quadro de Saúde Ambiental
<b>AIA</b>	: Avaliação de Impacte Ambiental
<b>SGI</b>	: Sistema de Gestão de Informações
<b>IEC</b>	: Informação, Educação e Comunicação
<b>ODM</b>	: Objectivos de Desenvolvimento do Milénio
<b>NEPAD</b>	: Nova Parceria para o Desenvolvimento de África
<b>SST</b>	: Serviço de Saúde no Trabalho
<b>OIN</b>	: Organização Internacional da Normalização
<b>OMD</b>	: Objectivos de Desenvolvimento do Milénio
<b>OOAS</b>	: Organização Oeste Africana da Saúde
<b>OCCGE</b>	: Organização de Coordenação e de Cooperação para o Combate às Grandes Endemias
<b>TD</b>	: Trabalhos Dirigidos
<b>TIC</b>	: Tecnologia da Informação e da Comunicação
<b>TP</b>	: Trabalhos Práticos
<b>TPE</b>	: Trabalho Pessoal Estudante
<b>UE</b>	: Unidade de Ensino
<b>COAS</b>	: Comunidade Anglófona Oeste Africana da Saúde
<b>SADS</b>	: Saneamento da Água e Desenvolvimento Sustentável

## **INTRODUÇÃO DOS DIRECTOR GERAL DA OOAS**

A Organização Oeste Africana da Saúde é a Instituição da Comunidade Económica dos Estados da África Ocidental (CEDEAO) especializada em saúde com a única responsabilidade de fornecer liderança em todas as áreas dos cuidados de saúde na região.

A Organização Oeste Africana da Saúde tem por missão oferecer o mais elevado nível de prestação de cuidados de saúde às populações da sub-região. Baseia-se na harmonização das políticas dos Estados-membros, na comunhão dos recursos e na cooperação entre os Estados - membros e os países terceiros a fim de, colectiva e estrategicamente, encontrar soluções para os problemas de saúde da sub-região. Os Chefes de Estado e de Governo descobriram a necessidade de gerir, motivar e reter os profissionais de recursos humanos da saúde, o que permite resolver a crise dos recursos humanos da saúde nos Estados-membros da CEDEAO.



Para o efeito, a Assembleia dos Ministros da Saúde da CEDEAO decidiu facilitar a formação de profissionais da saúde que responda aos problemas essenciais da saúde, bem como a disponibilidade e a mobilidade dos recursos humanos para a saúde na região da CEDEAO, o que também está de acordo com a implementação das seguintes acções:

1. Protocolo da CEDEAO / A/P3/1/03/Dakar e Convenção de 2003 sobre os A/C.1/1/03 relativos à educação e à formação na região CEDEAO sobre o reconhecimento dos estabelecimentos de ensino e a equivalência dos diplomas, certificados e outros títulos da CEDEAO.
2. Adopção de uma resolução sobre a harmonização dos curricula da CEDEAO pela 7ª Assembleia dos Ministros da Saúde (AMS) em Julho de 2006 em Abuja.
3. Adopção de uma resolução sobre a motivação e a retenção dos recursos humanos da saúde pela Assembleia dos Ministros da Saúde da CEDEAO (Yamoussoukro, Côte d'Ivoire 2009).
4. O plano 2009-2013 do segundo plano estratégico e operacional da OOAS exigiu que se deve desenvolver programas com base em competências, para a formação dos agentes comunitários de saúde do espaço CEDEAO.

A harmonização facilitada pela OOAS na região inclui a formação e a prática de todas as profissões de saúde e da profissão de saúde ambiental que são classificadas no quadro das profissões das disciplinas associadas de saúde. Esperamos que as universidades e os estabelecimentos de formação utilizarão este currículo harmonizado para desenvolver e reforçar a capacidade dos profissionais da saúde e reforçar o nosso sistema de cuidados de saúde no espaço CEDEAO.

Pensamos que este documento servirá igualmente de verdadeira plataforma para melhorar a mobilidade dos profissionais de saúde no espaço CEDEAO, e por conseguinte, promover a execução eficaz dos serviços de saúde preventivos e curativos para as populações da CEDEAO por pessoal qualificado. Permitirá igualmente acelerar a realização dos Objectivos de Desenvolvimento do Milénio no horizonte 2015 e depois.

**Dr Xavier CRESPIN**  
**Directeur Général**



## **PREÂMBULO**

Este programa destina-se à formação dos licenciados em saúde ambiental, em conformidade com as orientações das políticas de saúde dos diferentes países membros do espaço CEDEAO. O programa inclui módulos gerais e módulos específicos. Foi elaborado com base em tarefas profissionais que o licenciado em saúde ambiental deverá executar no terreno.

Os ensinamentos ministrados no primeiro ano permitem a aquisição de conhecimentos gerais em ciências de base: física, química, matemática, sociologia, comunicação.

Os ensinamentos do segundo ano são orientados para as competências específicas do licenciado em saúde ambiental. Finalmente, os ensinamentos do terceiro ano são organizados para competências de gestão e aplicação das competências específicas e investigação.

O processo de aprendizagem efectua-se através de um módulo de ensino e de actos pedagógicos que permitem o envolvimento activo do estudante. Este programa comporta ensinamentos teóricos e práticos, estágios e trabalhos de investigação.

### **1.0 A ÁREA DA SAÚDE AMBIENTAL**

A área da saúde ambiental é um serviço essencial que prevê soluções face às causas naturais e artificiais no quadro da saúde ambiental. Durante vários anos os praticantes da profissão provaram a existência de uma grande correlação entre o ambiente e o estado de saúde. Nos sítios em que as exigências da saúde ambiental são respeitadas, os índices de saúde de uma determinada sociedade melhoram muito. Haverá redução da taxa de morbilidade e de mortalidade nessas zonas enquanto a taxa aumentará nas zonas onde as exigências não são bem respeitadas. Isso foi claramente demonstrado pelos papéis desempenhados pelos inspectores sanitários dos anos 50 e 60 ao combater a ameaça de doenças como a varicela e a rubéola.

Os sucessos registados durante este período devem-se à renovação dos compromissos e à vontade política. Um dos melhores instrumentos necessários que permita aos governos realizar esta tarefa é o desenvolvimento das competências humanas. Para isso, é necessário analisar, de forma crítica, o programa de formação dos técnicos de engenharia sanitária envolvidos na administração dos serviços de saúde ambiental a fim de atingir a harmonização na região da CEDEAO. Os técnicos de engenharia sanitária ajudam o quadro superior a levar a cabo os seus trabalhos.

### **2.0 OBJECTIVOS DO PROCESSO DE HARMONIZAÇÃO**

- iv. Actualizar a área de intervenção dos quadros profissionais médios em relação aos desafios actuais necessários à instalação dos serviços de saúde ambiental.
- v. Desenvolver a área afectiva e cognitiva de um agente profissional médio da saúde ambiental para a aplicação de técnicas científicas simples que levarão à redução significativa da incidência das doenças e das más condições de saúde.
- vi. Inculcar ao quadro profissional a necessidade de melhorar (capacidade) o que lhe permite trabalhar com toda a confiança como assistente do quadro superior para levar a cabo o seu trabalho.

### 3.0 OBJECTIVOS DA FORMAÇÃO

No quadro da formação, o **licenciado em saúde alimentar** deverá ser capaz de atingir os objectivos específicos seguintes:

#### *A - OBJECTIVOS COGNITIVOS*

11. Descrever os princípios específicos em matéria de identificação e de análise dos problemas de saúde ambiental;
12. Identificar o modo de comunicação e a dinâmica de grupo necessária para introduzir mudanças de comportamento sustentáveis junto da comunidade;
13. Descrever o processo de inquérito e de avaliação necessária à identificação dos problemas de saúde ambiental da comunidade;
14. Descrever pormenorizadamente as etapas de planificação e de execução e um programa de saúde ambiental para resolver estes problemas;
15. Descrever as noções de base em física, sociologia e biologia, os conceitos, os princípios e a sua aplicação em matéria de saúde ambiental;
16. Descrever pormenorizadamente as doenças transmissíveis nos países da CEDEAO, o seu modo de transmissão e os métodos de controlo biológico e físico do ambiente a fim de as evitar;
17. Descrever, em pormenor, as principais doenças não transmissíveis nos países da CEDEAO, os factores de risco e os métodos biológicos e físicos de controlo do ambiente a fim de as evitar;
18. Estabelecer a lista das leis do país em matéria de saúde ambiental;
19. Explicar a aplicação racional das leis em matéria de saúde ambiental a fim de fazer com que sejam respeitadas pelos cidadãos;
20. Desenvolver uma cultura geral sólida sobre os diferentes temas ambientais.

#### *B. OBJECTIVOS PSICOMOTORES*

17. Aplicar os testes de laboratório padrão utilizados no controlo do ambiente físico, no abastecimento de água e na higiene alimentar;
18. Dimensionar um modo de tratamento ;
19. Conceber obras de saneamento autónomas em meio rural e urbano;
20. Fazer uma boa representação gráfica do modo de tratamento da água potável e a protecção das fontes de água em meio rural e urbano;
21. Realizar acções susceptíveis de prevenir as doenças e prolongar a vida;
22. Garantir um papel de liderança na gestão dos riscos ambientais durante os casos de urgência;
23. Gerir os recursos humanos, materiais e financeiros postos à sua disposição;
24. Conceber uma estratégia de gestão de uma epidemia;
25. Participar na formação e na reciclagem do pessoal de saúde e de outros intervenientes em matéria de saúde ambiental;
26. Analisar, do ponto de vista social e societário, os comportamentos humanos ligados aos lixos (comportamentos e quadros de vida, percepções e usos, sistemas de tratamento).
27. Garantir a vigilância da qualidade das águas potáveis, dos alimentos e da salubridade do meio;
28. Dominar perfeitamente as diferentes vertentes e tecnologias de tratamento dos lixos (tipo de lixos, tipo e escala de recolha, utilização, transformação, rentabilidade).
29. Seguir os trabalhos, tanto nos aspectos técnicos como financeiros, até à recepção dos projectos;
30. Participar na organização, animação, seguimento e avaliação das medidas adoptadas, em ligação com as equipas técnicas;

31. Participar na elaboração de um programa de acções apoiando-se em todas as competências internas e externas úteis, em especial na área técnica (riscos tecnológicos, riscos naturais);
32. Garantir a gestão dos problemas de saúde ambiental.

### ***C. OBJECTIVOS AFECTIVOS***

1. Desenvolver atitudes para um trabalho de equipa eficaz;
2. Desenvolver uma atitude de orgulho face à sua profissão;
3. Demonstrar uma atitude científica em relação aos inquéritos ligados às actividades da sua profissão;
4. Demonstrar vigilância e concentração constante para o trabalho sobre o controlo de qualidade, os procedimentos de reclamação e de declaração;
5. Ter bom conhecimento dos intervenientes mundiais na área do lixo e da regulamentação no respectivo sector de actividades.

## **4.0 QUADRO DE REFERÊNCIA PEDAGÓGICO**

A abordagem pelas competências serve de quadro de referência para formar os licenciados em saúde ambiental aptos a garantir as medidas de promoção e prevenção, realizar actividades de gestão dos riscos ambientais, em conformidade com as expectativas da população e dos profissionais de saúde a fim de proteger o ambiente e a saúde pública. Estas competências chave constituem os fios condutores na elaboração do curriculum.

### **❖ *COMPETÊNCIAS PROFISSIONAIS***

8. Gerir os riscos sanitários ligados às condições ambientais;
9. Informar, sensibilizar, apoiar e formar os indivíduos, as famílias e as comunidades em matéria de prevenção dos riscos sanitários ligados ao ambiente;
10. Gerir uma unidade de higiene e saneamento;
11. Desenvolver e melhorar a parceria entre os atores da saúde ambiental;
12. Participar na formação, na reciclagem, na supervisão do pessoal e no enquadramento dos estagiários;
13. Prestar assistência ao dono das empresas, às coletividades, às organizações profissionais, aos eleitos locais e outros actores em matéria de saúde ambiental;
14. Contribuir para a investigação – acção sobre a influência das exposições aos factores ambientais sobre a saúde.

### **❖ *LISTA DOS INSTRUMENTOS APROPRIADOS DE APRENDIZAGEM***

- Leituras sugeridas
- Módulos
- Jogos educativos
- Projectos
- Exposição feita pelo estudante
- Seminários
- Estudos de casos
- Sessões de laboratório
- Estágios
- Investigação - Inquérito
- Debates
- Esquematização

### ❖ **LISTA DOS INSTRUMENTOS APROPRIADOS PARA A AVALIAÇÃO DAS COMPETÊNCIAS E CAPACIDADES**

- Contextualização em meio real
- Contextualização em meio simulado
- Simulações
- Estudos de caso
- Provas de produto
- Entrevistas de avaliação
- Relatórios de análise

### ❖ **OS MODOS DE AVALIAÇÃO**

O modo de avaliação dos estudantes faz-se segundo sistemas LMD (ver anexo). Compreende o controlo contínuo com um exame de fim de semestre. Todavia, as exposições, os trabalhos de casa ou de grupo podem ser objecto de avaliação.

Os controlos são classificados de 0 a 20. Qualquer ausência não justificada num controlo dá lugar à nota zero. Todavia, é organizado um controlo de recuperação para os estudantes que apresentarem justificação.

### ❖ **AS SAÍDAS PROFISSIONAIS**

#### **a. Saídas**

O tecido profissional em torno das profissões da saúde ambiental é muito diversificado, desde as grandes empresas internacionais até aos gabinetes de estudo, o que explica que as expectativas dos profissionais continuem muito diversificadas. As profissões da saúde ambiental englobam uma série de actividades desde as obras públicas até aos postos de comunicação e de educação para o ambiente, passando pelos estudos de engenharia, diagnóstico e manutenção das instalações de gestão das águas residuais. Assim, os profissionais procuram mais competências que um simples perfil de posto.

Esta diversidade de perfis permite igualmente garantir a optimização da inserção profissional dos estudantes motivados e bem formados no sector privado ou público:

- As missões “ambiente/lixos” das colectividades locais e territoriais.
- Os Ministérios da Saúde Pública, da Habitação, do Urbanismo, do Ambiente e as administrações desconcentradas.
- O Ministério da Saúde Pública.
- Os meios de ensino especializados.
- Os gabinetes de estudos/ONG/empresas.
- As câmaras consulares e as federações profissionais.
- A imprensa especializada nas áreas lixos - ambiente.

A profissão deve desenvolver-se tendo em conta as múltiplas exigências regulamentares, do desenvolvimento da metrologia e das análises, e da implementação de procedimentos ou materiais novos. Esta profissão tem grandes perspectivas de desenvolvimento: importância da lixeira, peso da regulamentação e da planificação ao nível local, introdução da vertente gestão dos lixos e da latrinização das famílias nos concursos públicos e privados, peso dos Objectivos de Desenvolvimento do Milénio, políticas de desenvolvimento para um ambiente sustentável que sejam factores favoráveis ao emprego. Hoje, são as profissões ligadas à criação dos serviços públicos de saneamento não colectivo, amanhã será a investigação de profissionais do diagnóstico das habitações, a investigação de economias ou a recuperação de água potável.

Os estudantes titulares da licenciatura em saúde ambiental podem exercer as seguintes profissões:

- Responsável pela exploração da água potável e saneamento;
- Controlador de dispositivo de saneamento autónomo;
- Responsável de estudos;
- Controlador de dispositivo de saneamento colectivo;
- Conselheiro em gestão de efluentes agrícolas e industriais e de despejo
- Conselheiro em matéria de saneamento nas colectividades

No fim da sua formação, o licenciado em saúde ambiental trabalha principalmente no terreno ou num laboratório. Entre as profissões que lhe são oferecidas:

- **No terreno :** Técnico ambiental (vigilância do ambiente, inspecção, estudos, inquéritos, seguimento de projecto de despoluição dos locais)
- **No laboratório :** Técnico de laboratório ambiental (seguimento da qualidade das águas, dos solos, dos alimentos, dos lixos e do ar )
- **Nas administrações (gestão dos serviços) :** concepção de planos/programas/projectos, seguimento – avaliação, auditoria, comunicação.

#### **b. Actividades**

- Criar um plano de gestão de lixos estudando as diferentes abordagens técnicas.
- Implementar os programas locais de urbanismo e de saneamento.
- Conceber melhorias das actividades existentes e/ou propor actividades ou instalações novas.
- Dirigir a equipa de técnicos.
- Realizar estudos (ante-projecto, projecto e realização).
- Garantir a vigilância da qualidade e da segurança dos produtos alimentares, da água potável, dos meios (projectos, habitações, locais de trabalho, ambiente, locais públicos, estabelecimentos classificados).
- Garantir a vigilância das doenças vectoriais e o controlo dos vetores.
- Garantir a higiene dos estabelecimentos de cuidados.
- Verificar a aplicação dos textos regulamentares cuja violação pode culminar com procedimentos contenciosos.
- Informar os profissionais sobre as etiquetas e outros certificados de qualidade existentes.
- Realizar inspecções/inquéritos sobre o cumprimento das normas de salubridade pública, controlando a correcção das práticas comerciais (vigilância da qualidade dos alimentos, etc).
- Analisar a produção inicial de lixos e propor soluções de tratamento apropriadas.
- Dar respostas técnicas e económicas aos concursos de prestação de serviços feitos pelas colectividades locais no quadro da procura de soluções para o tratamento dos seus lixos (recolha, triagem - valorização, lixeiras).
- Investigar, analisar e controlar materiais.
- Propor uma secção de tratamento adequada em função do tipo de lixo.

#### **c. Perspectivas de evolução**

A licenciatura em saúde ambiental inscreve-se no percurso L/M/D oferecendo possibilidades de seguir uma carreira contínua para uma formação superior gradual na área (licenciatura, mestrado, doutoramento) com possibilidade de formações especializadas.

## **5.0. POSTOS DE TRABALHO**

- ✓ Distritos sanitários
- ✓ Direcções regionais
- ✓ Serviços municipais (colectividades locais e territoriais)
- ✓ ONG
- ✓ Projectos e programas de saúde
- ✓ Hospitais
- ✓ Gabinete de estudos
- ✓ Imprensa especializada nas áreas do ambiente
- ✓ Todos os ministérios envolvidos na área do ambiente e serviços descentralizados
- ✓ etc.

## **6.0. DURAÇÃO DA FORMAÇÃO**

- 3 anos, ou seja 6 semestres

## **7.0. CRITÉRIOS DE SELECÇÃO DOS CANDIDATOS**

- Concurso directo
- Concurso profissional
- Teste de nível para as inscrições a título privado

## **8.0. CONDIÇÕES DE ADMISSÃO (ACESSO):**

### **8.0.1 Para os estudantes**

- Ser titular de um BAC científico série C, D ou equivalente
- Ser admitido ao concurso ou ao teste
- Estar de boa saúde

### **8.0.2 Para os profissionais**

- Ser titular de um diploma de técnico de higiene e saneamento (BEPC+ 3 anos) ou equivalente
- Ter pelo menos 3 anos de experiência profissional
- Ser admitido ao concurso ou ao teste
- Estar de boa saúde

## **9.0. TÍTULO DO DIPLOMA A SER CONCEDIDO**

- Licenciatura em Saúde Ambiental

## **10.0. MODALIDADES DOS EXAMES**

### **10.0.1. Organização dos exames**

No fim da formação será organizado um exame final.

O comité de organização desse exame será composto por representantes das escolas/institutos, representantes do Ministério da Saúde e representantes do Ministério do Ensino Superior.

### **10.0.2. Período de exames, férias**

### **10.0.3. Período de exames**

- Fins de Julho



- **Férias**

- Agosto e Setembro

## **11.0. ESTÁGIOS**

Os estágios terão lugar no fim do ensino do referencial teórico, de preferência no fim do ano.

### **Duração dos estágios práticos :**

- 1º ano : 1 mês
- 2º ano : 2 meses
- 3º ano : 3 meses

A preparação para o Diploma do **licenciado em saúde ambiental** comporta três (3) categorias de estágios :

### **Áreas precisas de estágio :**

- 1º ano: Estágio em engenharia civil
- 2º ano: Estágio em higiene do ambiente
- 3º ano: Estágio de aplicação

A aceitação do estágio é condicionada pela validação de todas as competências previstas na caderneta de estágio. A passagem para o ano seguinte e a obtenção do diploma são condicionadas pela validação dos estágios.

### **Relatório de estágio**

No fim de cada estágio, sob a supervisão de um diretor de estágio, o estudante elabora um relatório.

## **12.0. CONDIÇÕES DE IMPLEMENTAÇÃO DO PROGRAMA**

**Ter professores de alto nível qualificados para:**

### **Cursos teóricos**

- Mestrado ou engenheiro
- Doutorado

### **Cursos práticos,**

- Mestrado ou engenheiro
- Doutorado
- Licenciado/Técnico de higiene e saneamento com experiência profissional de pelo menos 3 anos.

### **Ter um equipamento adequado:**

- Materiais de desenho;
- Materiais de construção e de topografia;
- Materiais de desinfecção e de luta contra os vectores de doenças;
- Materiais de análise do ar, das águas, dos alimentos, do solo, dos lixos, etc.
- Materiais informáticos ;
- Qualquer outro equipamento ou material necessário à formação em saúde ambiental.

***NB. Os equipamentos não podem dar os resultados esperados sem a presença de infra-estruturas (sala de demonstração, laboratório, sala de informática ....)***

### **13.0. REGULAMENTAÇÃO DA FORMAÇÃO E DO EXERCÍCIO DA FUNÇÃO**

A formação e o exercício da função necessitam de regulamentação.

#### **13.1. Formação**

- Autorização da criação da escola/instituto
- Decreto determinando o programa de formação
- Decreto fixando o perfil dos professores

#### **13.2. Função**

- Criação da ordem dos profissionais de saúde ambiental
- Autorização de exercício
- Código de deontologia

#### **13.3. Criação de um conselho sub-regional de profissionais :**

##### **1. Constituição do conselho**

- Um representante da ordem de cada país
- Um representante da OOAS.

##### **2. Atribuições do conselho**

- Regulamentação da profissão
- Investigação na área do ambiente
- Coordenação das actividades
- Verificação da aplicabilidade dos textos regulamentares
- Verificação regular da evolução da regulamentação.

##### **3. Modo de criação e coordenação do Conselho**

- Organização de uma assembleia geral dos diferentes representantes;
- A coordenação será garantida por um representante da OOAS.

### **14.0. CONVENÇÃO PARA A NOMENCLATURA DAS MATÉRIAS**

➤ As letras indicam o tipo de unidade de ensino, sendo no total cinco (5) assim denominadas:

- ⊙ Ciências de base : CB
- ⊙ Ciências de saúde pública : CSP
- ⊙ Ciências de saúde ambiental: CSA
- ⊙ Ciências de gestão : CG
- ⊙ Estudos gerais : EG

➤ O primeiro número define o semestre,

➤ O segundo número identifica o curso (a matéria) da unidade de ensino,

➤ Os dois grupos de números são separados por uma barra oblíqua.

### 15.0. PROGRAMA DE FORMAÇÃO

Compreender cinco (5) Unidades de Ensino (UE) subdivididas em quarenta e três (43) matérias com três (3) estágios repartidos nos três (3) anos acadêmicos.

**Nb. As horas de trabalho pessoal do estudante são obrigatórias e incluídas nos créditos de cada matéria.**

#### PRIMEIRO ANO - PRIMEIRO SEMESTRE

Código do curso	Título do curso	Módulos	Horas	Teoria <sup>2</sup>	Práticas <sup>2</sup>	Créditos <sup>2</sup>
CBI/1	Física		40	20	20	2
CBI/2	Química aplicada e orgânica		40	20	20	2
CBI/3	Anatomia e fisiologia		40	20	20	2
CBI/4	Ecologia/Geologia	Geologia geral Hidrogeologia	40	20	20	2
CSAI/1	Construção de edifícios e realização de obras de saneamento	Engenharia civil Topografia	120	60	60	6
CSAI/2	Desenho técnico		60	30	30	3
CBI/5	Matemáticas aplicadas		40	20	20	2
CGI/1	Sociologia e Antropologia	Socio-antropologia da saúde Socio-antropologia do ambiente	60	30	30	3
CGI/2	Iniciação à informática/biblioteca	Informática Investigação documental	60	20	40	3
CBI/6	Microbiologia	Bacteriologia – virologia Parasitologia	60	30	30	3
EGI/1	Comunicação em inglês		40	20	20	2
<b>Total</b>			<b>600</b>	<b>290</b>	<b>310</b>	<b>30</b>

<sup>2</sup> Um crédito equivale a 20 horas

<sup>2</sup> A carga horária total deve ser respeitada para cada curso. Entretanto, pode haver flexibilidade na repartição entre a carga horária teórica e a dos trabalhos práticos.

**PRIMEIRO ANO - SEGUNDO SEMESTRE (estágio 1 mês)**

<b>Código do curso</b>	<b>Título do curso</b>	<b>Módulos</b>	<b>Horas</b>	<b>Teoria</b>	<b>Práticas</b>	<b>Créditos</b>
EGI/2	Planificação e desenvolvimento		60	30	30	3
CSAI/3	Desenvolvimento sustentável		40	20	20	2
CSAI/4	Alterações climáticas		40	20	20	2
CSAI/5	Gestão das catástrofes e bioterrorismo		60	30	30	3
CGI/3	Planificação e gestão de projectos		40	20	20	2
CSAI/6	Epidemiologia	Epidemiologia descritiva	60	30	30	3
		Epidemiologia analítica				
CSPI/1	Saúde comunitária I		40	20	20	2
CSPI/2	Doenças transmissíveis e não transmissíveis	Doenças hídricas	60	30	30	3
		Doenças de transmissão vectorial				
		Doenças não transmissíveis				
CSPI/3	Os sistemas de gestão da informação em matéria de saúde I		40	20	20	2
CSAI/7	<b>Estágio em engenharia civil</b>		160	---	160	8
<b>Total</b>			<b>600</b>	<b>220</b>	<b>380</b>	<b>30</b>

**SEGUNDO ANO - PRIMEIRO SEMESTRE**

Código do curso	Título do curso	Módulos	Horas	Teoria	Práticas	Créditos
CSAII/8	Produtos alimentares: Higiene e patologias	Microbiologia alimentar	80	40	40	4
		Higiene alimentar e nutrição				
CSAII/9	Saúde no trabalho	Patologias profissionais	80	40	40	4
		Higiene e segurança no trabalho				
CSAII/10	Divisão dos estabelecimentos públicos e privados		80	40	40	4
CSAII/11	Luta contra os vectores de doenças		80	40	40	4
CSAII/12	Educação e promoção da saúde ambiental		80	40	40	4
CSPII/4	Sistemas de gestão da informação em matéria de saúde II		60	30	30	3
CSPII/5	Saúde comunitária II		40	20	20	2
CSPII/13	Gestão dos lixos	Saneamento das águas residuais	100	60	40	5
		Saneamento dos lixos sólidos				
Total			600	310	290	30

**SEGUNDO ANO – SEGUNDO SEMESTRE (estágios 2 meses)**

<b>Código do curso</b>	<b>Título do curso</b>	<b>Módulos</b>	<b>Horas</b>	<b>Teoria</b>	<b>Práticas</b>	<b>Créditos</b>
CSAII/14	Leis em saúde ambiental e processos legais	Direito do ambiente	40	20	20	2
		Direito da saúde ambiental				
CSAII/15	Gestão do ar		40	20	20	2
CSAII/16	Recursos hídricos e gestão da qualidade	Hidráulica	100	50	50	5
		Aprovisionamento em água potável				
CSAII/17	Luta contra a poluição		80	40	40	4
CSPII/6	Educação e promoção da saúde		80	40	40	4
CSPII/18	Ecotoxicologia		60	30	30	3
CSAII/19	Gestão dos cadáveres e casas mortuárias		40	20	20	2
CSAII/20	Inspeção sanitária dos locais	Inspeção dos estabelecimentos classificados	80	40	40	4
		Inspeção dos estabelecimentos que recebem público				
CSPII/7	Higiene hospitalar		40	30	10	2
<b>Total</b>			<b>560</b>	<b>290</b>	<b>270</b>	<b>28</b>

**Estágio de higiene ambiental**

<b>Código do curso</b>	<b>Título do curso</b>	<b>Módulos</b>	<b>Horas</b>	<b>Teoria</b>	<b>Práticas</b>	<b>Créditos</b>
CSAII/21	<b>Estágio de higiene ambiental</b>		<b>320</b>	<b>0</b>	<b>320</b>	<b>16</b>

**TERCEIRO ANO – PRIMEIRO SEMESTRE**

<b>Código do curso</b>	<b>Título do curso</b>	<b>Módulos</b>	<b>Horas</b>	<b>Teoria</b>	<b>Práticas</b>	<b>Créditos</b>
CSAIII/22	Alojamento	Habitat e saúde pública	100	50	50	5
		Urbanismo				
		Higiene do habitat				
CSAIII/23	Ética e código de deontologia		80	40	40	4
EGIII/3	Redacção administrativa		40	20	20	2
CSAIII/24	Estudo de impacto ambiental	Impactos ambiental e social	160	80	80	8
		Gestão dos riscos ambientais				
CSAIII/25	Gestão da segurança	Segurança sanitária	40	20	20	2
		Segurança ambiental				
CSPIII/8	Bioestatística e metodologia de investigação		180	90	90	9
<b>Total</b>			<b>600</b>	<b>300</b>	<b>300</b>	<b>30</b>

**TERCEIRO ANO – SEGUNDO SEMESTRE**

<b>Código do curso</b>	<b>Título do curso</b>		<b>Horas</b>	<b>Teoria</b>	<b>Práticas</b>	<b>Créditos</b>
CSAIII/26	Estágio prático (3 meses)		600	0	600	30
CSAIII/27	Redacção e apresentação da monografia		200	0	200	10
<b>Total</b>			<b>600</b>	<b>0</b>	<b>800</b>	<b>40</b>

**RECAPITULAÇÃO DOS HORÁRIOS**

<b>ANO DE ESTUDOS</b>	<b>Horas</b>	<b>Teoria</b>	<b>Práticas</b>	<b>Créditos</b>
PRIMEIRO ANO	1 200	510	690	70
SEGUNDO ANO	1 200	600	600	60
TERCEIRO ANO	1 400	300	1200	70
<b>Total</b>	<b>3 800</b>	<b>1410</b>	<b>2490</b>	<b>200</b>

## **16.0. ORGANIZAÇÃO DAS U.E. E DAS MATÉRIAS**

### **☉ Ciências básicas : CB**

<b>Código do curso</b>	<b>Título do curso</b>	<b>Horas</b>	<b>Teoria</b>	<b>Prática</b>	<b>Créditos</b>
CBI/1	Física	40	20	20	2
CBI/2	Química aplicada e orgânica	40	20	20	2
CBI/3	Anatomia e fisiologia	40	20	20	2
CBI/4	Ecologia/Geologia	40	20	20	2
CBI/5	Matemáticas Aplicadas	40	20	20	2
CBI/6	Microbiologia	60	30	30	3
<b>Total</b>		<b>260</b>	<b>130</b>	<b>130</b>	<b>13</b>

### **☉ Ciências de saúde pública : CSP**

<b>Código do curso</b>	<b>Título do curso</b>	<b>Horas</b>	<b>Teoria</b>	<b>Prática</b>	<b>Créditos</b>
CSPI/1	Saúde comunitária I	40	20	20	2
CSPI/2	Doenças transmissíveis e não transmissíveis	60	30	30	3
CSPI/3	Sistemas de gestão da informação em matéria de saúde I	40	20	20	2
CSPII/4	Sistemas de gestão da informação em matéria de saúde II	40	20	20	2
CSPII/5	Saúde comunitária II	40	20	20	2
CSPII/6	Educação e promoção da saúde	40	20	20	2
CSPII/7	Higiene hospitalar	40	30	10	2
CSPIII/8	Bioestatística e metodologia da investigação	180	90	90	9
<b>Total</b>		<b>480</b>	<b>250</b>	<b>230</b>	<b>24</b>

### **☉ Ciências de saúde ambiental: CSA**

<b>Código do curso</b>	<b>Título do curso</b>	<b>Horas</b>	<b>Teoria</b>	<b>Prática</b>	<b>Créditos</b>
CSAI/1	Construção de instalações e realização de obras de saneamento	120	60	60	6
CSAI/2	Desenho técnico	60	30	30	3
CSAI/3	Desenvolvimento sustentável	40	20	20	2
CSAI/4	Alterações climáticas	40	20	20	2
CSAI/5	Gestão de catástrofes e bioterrorismo	60	30	30	3
CSAI/6	Epidemiologia	60	30	30	3
CSAI/7	<b>Estágio em engenharia civil</b>	160	---	160	8
<b>TOTAL</b>		<b>540</b>	<b>190</b>	<b>350</b>	<b>27</b>



<b>Código do curso</b>	<b>Título do curso</b>	<b>Horas</b>	<b>Teoria</b>	<b>Prática</b>	<b>Créditos</b>
CSAII/8	Produtos alimentares: higiene e patologias	80	40	40	4
CSAII/9	Saúde no trabalho	40	20	20	2
CSAII/10	Repartição dos estabelecimentos públicos e privados	40	20	20	2
CSAII/11	Luta contra os vectores de doenças	60	30	30	3
CSAII/12	Educação e promoção da saúde ambiental	40	20	20	2
CSAII/13	Gestão dos lixos	100	60	40	5
CSAII/14	Leis de saúde ambiental e processos legais	40	20	20	2
CSAII/15	Gestão do ar líquido	40	20	20	2
CSAII/16	Recursos hídricos e gestão da qualidade	60	30	30	3
CSAII/17	Luta contra a poluição	80	40	40	4
CSAII/18	Ecotoxicologia	60	30	30	3
CSAII/19	Gestão dos cadáveres e morgues	40	20	20	2
CSAII/20	Inspecção sanitária dos locais	80	40	40	4
CSAII/21	Estágio de higiene do ambiente	<b>320</b>	<b>0</b>	<b>320</b>	<b>16</b>
<b>Total</b>		<b>1080</b>	<b>390</b>	<b>690</b>	<b>54</b>

<b>Código do curso</b>	<b>Título do curso</b>	<b>Horas</b>	<b>Teoria</b>	<b>Prática</b>	<b>Créditos</b>
CSAIII/2 2	Habitação	100	50	50	5
CSAIII/2 3	Ética e código de deontologia	80	40	40	4
CSAIII/2 4	Estudo de impacto ambiental	160	80	80	8
CSAIII/2 5	Gestão da segurança	40	20	20	2
CSAIII/2 6	Estágio prático (3 meses	480	0	480	24
CSAIII/2 7	<b>Redacção e apresentação do relatório da monografia</b>	120	0	120	6
<b>Total</b>		<b>980</b>	<b>190</b>	<b>790</b>	<b>49</b>

⊙ **Ciências de gestão : CG**

<b>Código do curso</b>	<b>Título do curso</b>	<b>Horas</b>	<b>Teoria</b>	<b>Prática</b>	<b>Créditos</b>
CGI/1	Sociologia e Antropologia	60	30	30	3
CGI/2	Iniciação à Informática/Biblioteca	60	20	40	3
CGI/3	Planificação e gestão de projectos	40	20	20	2
<b>Total</b>		<b>160</b>	<b>70</b>	<b>90</b>	<b>8</b>

☉ Estudos gerais : EG

<b>Código do curso</b>	<b>Título do curso</b>	<b>Horas</b>	<b>Teoria</b>	<b>Prática</b>	<b>Créditos</b>
EGI/1	Comunicação em Inglês	40	20	20	2
EGI/2	Planificação e desenvolvimento	60	30	30	3
EGIII/3	Redacção administrativa	40	20	20	2
<b>Total</b>		<b>140</b>	<b>70</b>	<b>70</b>	<b>7</b>

## 17.0. OBJECTIVOS E CONTEÚDOS DAS MATÉRIAS/CURSOS

1.	<p><b>FÍSICA</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <p>Descrever os processos de transferência do calor da temperatura e da pressão ligado aos movimentos da atmosfera e da água</p> <ol style="list-style-type: none"><li>1. Explicar as propriedades físicas da água, do ar e do solo</li><li>2. Descrever as propriedades físicas dos materiais de construção</li><li>3. Aplicar as medidas e as condições básicas</li><li>4. Discutir os perigos das profissões em relação com o ambiente e a física.</li></ol> <p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"><li>• Os processos físicos (a transferência de calor, a temperatura e a pressão ligadas aos movimentos da atmosfera e da água)</li><li>• As propriedades físicas da água, do ar e do solo</li><li>• As propriedades dos materiais de construção</li><li>• As medidas e as conversões de base</li><li>• Termodinâmica</li><li>• Leis dos gases</li><li>• Ondas e teoria das ondas</li><li>• Ionização e radiação não iónica</li></ul>
2.	<p><b>QUÍMICA APLICADA E ORGÂNICA</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"><li>1. Aplicar as medidas e as conversões de base</li><li>2. Escrever os princípios de base da química</li><li>3. Descrever a química do ar, da água, do solo e dos alimentos</li><li>4. Descrever o movimento, o armazenamento e a reciclagem dos produtos químicos no ambiente</li><li>5. Descrever a incidência da poluição química no ambiente e na saúde</li><li>6. Descrever as profissões da química e dos riscos ambientais</li><li>7. Descrever as propriedades químicas dos materiais de construção</li><li>8. Identificar as vantagens e os limites dos instrumentos utilizados para a análise das amostras que inclui:<ul style="list-style-type: none"><li>• Espectrometria de massa</li><li>• Cromatografia em fase gasosa</li><li>• Espectrometria por absorção atómica</li><li>• Cromatografia de líquido a alta pressão</li></ul></li><li>1. Explicar os princípios dos detergentes e dos desinfetantes</li><li>2. Identificar os riscos físicos, biológicos e químicos</li><li>3. Identificar os principais grupos de alimentos</li><li>4. Descrever os principais princípios da química alimentar</li><li>5. Aplicar os métodos padrão para avaliar a composição química dos alimentos</li><li>6. Átomo molécula, orbital, mesomeria, estereoquímica, ácidos, bases</li><li>7. Explicar a nomenclatura em química orgânica</li><li>8. Identificar os grupos funcionais</li><li>9. Explicar os mecanismos de base.</li></ol> <p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"><li>o As medidas e as conversões de base</li></ul>

	<ul style="list-style-type: none"> <li>○ Os princípios básicos da química</li> <li>○ A química do ar, da água, do solo e dos alimentos</li> <li>○ O movimento, a armazenagem e a reciclagem dos produtos químicos no ambiente</li> <li>○ A incidência da poluição química no ambiente e na saúde</li> <li>○ As profissões da química e os riscos ambientais</li> <li>○ As propriedades dos materiais de construção</li> <li>○ As vantagens e os limites dos instrumentos utilizados para a análise das amostras que inclui a espectrometria de massa, a cromatografia em fase gasosa, a espectrometria por absorção atômica, a cromatografia de líquido em alta pressão</li> <li>○ Os princípios dos detergentes e dos desinfetantes</li> <li>○ Os riscos físicos, biológicos e químicos</li> <li>○ Os principais grupos de alimentos</li> <li>○ Os principais princípios da química alimentar</li> <li>○ Os métodos padrão para avaliar a composição química dos alimentos</li> <li>○ A nomenclatura dos compostos orgânicos</li> <li>○ Os compostos alifáticos</li> <li>○ Os compostos aromáticos</li> <li>○ Os outros grupos funcionais : os álcoois, os aminoácidos, compostos de carbono, ácidos carboxílicos, fenóis, éteres</li> <li>○ Os mecanismos de base</li> </ul>
3.	<p><b>ANATOMIA E FISIOLOGIA</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>1. Descrever a estrutura humana normal e sua função num contexto de saúde</li> <li>2. Descrever a anatomia, a fisiologia, a patologia humana, dos animais e das plantas</li> <li>3. Descrever e comunicar a estrutura e a função dos sistemas específicos do corpo humano e da planta</li> <li>4. Descrever os sistemas circulatório, nervoso, respiratório, endócrino, digestivo e urinário em relação ao impacto da exposição e aos efeitos na saúde dos produtos químicos, biológicos, psíquicos e psicossociais</li> <li>5. Explicar os princípios da vigilância biológica</li> </ol> <p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"> <li>• A estrutura humana normal e a sua função num contexto de saúde</li> <li>• A anatomia, a fisiologia, a patologia humana, dos animais e das plantas</li> <li>• A estrutura e a função dos sistemas específicos do corpo e da planta</li> <li>• Os sistemas circulatório, nervoso, respiratório, endócrino, digestivo e urinário em relação ao impacto da exposição e os efeitos na saúde dos produtos químicos, biológicos, físicos e psicossociais</li> <li>• Os princípios da vigilância biológica</li> </ul>
4.	<p><b>ECOLOGIA/GEOLOGIA</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>1. Descrever os princípios da ecologia e da geologia</li> <li>2. Fazer a comunicação relativamente à geologia e ao desenvolvimento sustentável</li> <li>3. Explicar o ambiente como um complexo da interacção dos sistemas biofísicos sociais económicos/políticos</li> <li>4. Discutir a formação mineral de substâncias: amianto, cilício, óleo, etc..</li> </ol>

	<ol style="list-style-type: none"> <li>5. Explicar a ciência básica do solo em relação à migração das águas subterrâneas e à permeabilidade dos poluentes nos vários tipos de solo</li> <li>6. Explicar a construção, os materiais e os métodos aplicáveis</li> <li>7. Explicar a mecânica ligada às estruturas do solo</li> <li>8. Descrever os princípios da ecologia e a geologia e sua relação com a segurança alimentar e a cadeia alimentar</li> </ol> <p><b><u>Conteúdo</u></b></p> <ol style="list-style-type: none"> <li>i. Os princípios da ecologia e da geologia</li> <li>j. A geologia e o desenvolvimento sustentável</li> <li>k. O ambiente como complexo da interação dos sistemas biofísicos sociais, económicos/políticos</li> <li>l. A formação mineral de substâncias : amianto, cilício, óleo, etc.</li> <li>m. A ciência de base do solo em relação à migração das águas subterrâneas e a permeabilidade dos poluentes em vários tipos de solo</li> <li>n. A construção, os materiais e os métodos aplicáveis</li> <li>o. A mecânica ligada às estruturas do solo</li> <li>p. Os princípios da ecologia e da geologia e a relação com a segurança alimentar e a cadeia alimentar.</li> </ol>
5.	<p><b>CONSTRUÇÃO DE EDIFÍCIOS E REALIZAÇÃO DAS OBRAS DE SANEAMENTO</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>1. Explicar o comportamento de diferentes materiais empregues na construção de edifícios</li> <li>2. Identificar as vantagens e os inconvenientes de diferentes materiais de construção</li> <li>3. Explicar os diferentes tipos de carga numa fundação</li> <li>4. Descrever a conveniência de uma instalação na qual se deve construir um edifício padrão.</li> <li>5. Descrever o trabalho necessário a ser feito para permitir a instalação da drenagem, o nivelamento, a orientação, as entradas, a evacuação das águas superficiais e a instalação das obras de saneamento</li> <li>6. Determinar os esforços e os constrangimentos dos materiais de construção</li> <li>7. Avaliar a conveniência das infra-estruturas do edifício (distribuição de água, sistemas de aquecimento, instalações elétricas e proteção contra os incêndios)</li> <li>8. Aplicar, de forma crítica, os princípios chave da construção de edifícios e de obras de saneamento</li> <li>9. Aplicar os princípios fundamentais das ciências ambientais para a avaliação dos factores de conforto do homem, a humidade, a condensação e a ventilação ligadas às formas alternativas de construção de edifícios</li> <li>10. Elaborar orçamentos para a construção de obras de saneamento autónomo.</li> </ol> <p><b><u>Conteúdo</u></b></p> <ol style="list-style-type: none"> <li>1. O comportamento de diferentes materiais empregues na construção de edifícios.</li> <li>2. As vantagens e os inconvenientes de diferentes materiais de construção.</li> <li>3. Os diferentes tipos de carga numa fundação</li> <li>4. A conveniência de uma instalação na qual se deve construir um edifício padrão</li> <li>5. O trabalho necessário a ser feito para permitir a instalação da drenagem, o</li> </ol>

	<p>nivelamento, a orientação, as entradas, a evacuação das águas superficiais, a instalação das obras de saneamento</p> <ol style="list-style-type: none"> <li>Os esforços e os constrangimentos dos materiais de construção</li> <li>Avaliação da qualidade das infra-estruturas do edifício (distribuição de água, sistemas de aquecimento, instalações elétricas e proteção contra os incêndios)</li> <li>Os princípios chave da construção de edifícios e de obras de saneamento</li> <li>Os princípios fundamentais das ciências ambientais para a avaliação dos factores de conforto do homem, a humidade, a condensação e a ventilação ligadas às formas alternativas de construção e de edifícios</li> <li>Planos e orçamentos para a construção de obras de saneamento autónomo.</li> </ol>
6.	<p><b>DESENHO TÉCNICO</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>Explicar o significado e os objectivos do desenho técnico</li> <li>Explicar as formas de conversão do sistema internacional de medida</li> <li>Aplicar as normas convencionais de representação gráfica dos edifícios e obras de saneamento</li> <li>Traçar as diferentes figuras geométricas da área do desenho</li> <li>Executar as diferentes faces, cortes e tipos de perspectivas de uma peça ou de um elemento de obra</li> <li>Executar e interpretar a cotação de um plano, a vista da planta, as perspectivas e os planos de corte</li> <li>Explicar as modalidades de reprodução, de dobragem e de classificação da folha de desenho.</li> </ol> <p><b><u>Conteúdo</u></b></p> <ol style="list-style-type: none"> <li>O significado e os objectivos do desenho técnico</li> <li>As formas de conversão do sistema internacional de medida</li> <li>As normas convencionais de representação gráfica dos edifícios e obras de saneamento</li> <li>As diferentes figuras geométricas da área do desenho</li> <li>As diferentes faces, cortes, e tipos de perspectivas de uma peça ou de elemento de obra</li> <li>Execução e interpretação da cotação de um plano, a vista da planta, as perspectivas e os planos de corte</li> <li>As modalidades de reprodução, dobragem e classificação da folha de desenho.</li> </ol>
7.	<p><b>MATEMÁTICA APLICADA</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>Aplicar o conhecimento teórico à prática nas áreas seguintes: <ul style="list-style-type: none"> <li>Conversões</li> <li>Sistema métrico</li> <li>Funções simples e gráficos</li> <li>Estatísticas descritivas</li> <li>Leis exponenciais e logaritmos</li> <li>Aritmética e cálculos</li> </ul> </li> <li>Aplicar o cálculo e a conversão da qualidade do ar e da captação da água, da dispersão modeladora, dos cálculos de emissão, duração de vida do entulho e cálculo da capacidade da água potável e das águas residuais</li> </ol>

	<ol style="list-style-type: none"> <li>3. Aplicar as fórmulas adequadas para resolver os problemas ligados à construção</li> <li>4. Aplicar a conversão, os sistemas métricos, as funções simples e os gráficos</li> <li>5. Explicar o significado e a importância da avaliação da saúde.</li> </ol> <p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"> <li>- Aplicação do conhecimento teórico à prática nas áreas seguintes : <ul style="list-style-type: none"> <li>• Conversões</li> <li>• Sistema métrico</li> <li>• Funções simples e gráficos</li> <li>• Estatísticas descritivas</li> <li>• Leis exponenciais e logaritmos</li> <li>• Aritmética e cálculos</li> </ul> </li> <li>- O cálculo e a conversão da qualidade do ar e da captação da água, da dispersão modeladora, dos cálculos de emissão, da duração de vida do entulho e do cálculo da capacidade da água potável e das águas residuais</li> <li>- As fórmulas apropriadas para resolver problemas ligados à construção</li> <li>- A conversão, os sistemas métricos, as funções simples e os gráficos</li> <li>- O significado e a importância da avaliação da saúde.</li> </ul>
8.	<p><b>SOCIOLOGIA E ANTROPOLOGIA</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>1. Descrever os princípios sociais e psicológicos de base relativamente aos processos de participação e de consulta do público (população)</li> <li>2. Descrever e comunicar o comportamento humano em termos de aspectos específicos da saúde ambiental (a psicologia ambiental isto é, o stress e as emoções etc.)</li> <li>3. Avaliar as visões mundiais sobre a cultura no que diz respeito à promoção da saúde</li> <li>4. Descrever a importância dos sistemas do conhecimento</li> <li>5. Aplicar os princípios da dinâmica de grupo nos grupos sociais</li> <li>6. Descrever a importância da cultura e a socialização na saúde ambiental</li> <li>7. Descrever o desenvolvimento humano através da esperança de vida</li> <li>8. Fazer a ligação dos impactos sociais ao processo de avaliação das incidências no ambiente</li> <li>9. Descrever os aspectos sociais da planificação ambiental</li> <li>10. Descrever o papel da saúde ambiental em relação ao bem estar</li> <li>11. Descrever a construção social, biológica e química do ambiente em relação à saúde das pessoas</li> <li>12. Identificar e explicar as desigualdades na saúde.</li> </ol> <p><b><u>Conteúdo</u></b></p> <ol style="list-style-type: none"> <li>1. Os princípios sociais e psicológicos de base relativamente aos processos de participação e de consulta do público (população)</li> <li>2. O comportamento humano em termos de aspectos específicos da saúde ambiental (a psicologia ambiental isto é, o stress e as emoções etc.)</li> <li>3. As visões mundiais sobre a cultura no que diz respeito à promoção da saúde</li> <li>4. A importância dos sistemas tradicionais do conhecimento</li> <li>5. Os princípios da dinâmica de grupo nos grupos sociais</li> <li>6. A importância da cultura e da socialização na saúde ambiental</li> <li>7. O desenvolvimento humano através da esperança de vida</li> <li>8. Os impactos sociais no processo de avaliação das incidências no ambiente</li> <li>9. Os aspetos sociais da planificação ambiental</li> </ol>

	<p>10. O papel da saúde ambiental em relação ao bem-estar</p> <p>11. A construção social, biológica e química do ambiente em relação à saúde das pessoas</p> <p>12. As desigualdades na saúde</p>
9.	<p><b>INICIAÇÃO À INFORMÁTICA/BIBLIOTECA</b></p> <p><b><u>OBJECTIVOS DE APRENDIZAGEM</u></b></p> <ol style="list-style-type: none"> <li>1. Conhecer as noções básicas de informática</li> <li>2. Conhecer as noções de TIC</li> <li>3. Utilizar os programas de tratamento de texto e de dados</li> <li>4. Utilizar a internet para a pesquisa documental</li> </ol> <p><b><u>CONTEÚDO</u></b></p> <ul style="list-style-type: none"> <li>• Noções básicas de informática</li> <li>• Noções de TIC</li> <li>• Programas de tratamento de texto (word, excel, power point)</li> <li>• A internet e a pesquisa documental</li> <li>• Modernização, pesquisa enciclopédica, pesquisa documental, utilização de um motor de busca e formulação de equação de busca, pesquisa de artigos e de periódicos.</li> </ul>
10.	<p><b>MICROBIOLOGIA E PARASITOLOGIA</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>1. Descrever a estrutura e a função dos potenciais microrganismos patogénicos em relação à qualidade do ar, da água e do solo</li> <li>2. Descrever a gama de microrganismos presentes no ar, na alimentação, na água e no solo, as suas origens e o seu mecanismo de propagação</li> <li>3. Descrever os riscos biológicos no local de trabalho</li> <li>4. Aplicar as técnicas de microscópio apropriadas e pertinentes para a análise da água, a segurança profissional na área da saúde e da segurança alimentar</li> <li>5. Descrever o papel dos microrganismos no ar, na alimentação, na água e no solo em relação à poluição</li> <li>6. Descrever os principais termos e princípios relativamente à sobrevivência, ao crescimento e à destruição dos microrganismos</li> <li>7. Descrever os métodos para limitar o crescimento dos microrganismos na alimentação.</li> </ol> <p><b><u>conteúdo</u></b></p> <ol style="list-style-type: none"> <li>a) A estrutura e a função dos potenciais microrganismos patogénicos em relação à qualidade do ar, da água e do solo</li> <li>b) A gama de microrganismos presentes no ar, na alimentação, na água e no solo, as suas origens e o seu mecanismo de propagação</li> <li>c) Os riscos biológicos no local de trabalho</li> <li>d) As técnicas de microscópio apropriadas e pertinentes para a análise da água, a segurança profissional na área da saúde e da segurança alimentar.</li> <li>e) O papel dos microrganismos no ar, na alimentação, na água e no solo em relação à poluição.</li> <li>f) Os principais termos e princípios relativamente à sobrevivência, ao crescimento e à destruição dos microrganismos.</li> <li>g) Os métodos para limitar o crescimento dos microrganismos na alimentação.</li> </ol>



11.	<p><b>COMUNICAÇÃO EM INGLÊS</b></p> <p><b><u>Objectivos e aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>1. Utilizar, através da expressão oral, os conceitos e vocábulos da saúde ambiental</li> <li>2. Utilizar as estruturas gramaticais necessárias e apropriadas na comunicação com outras pessoas</li> <li>3. Utilizar por escrito os conceitos e vocábulos da saúde ambiental.</li> </ol> <p><b><u>Conteúdo</u></b></p> <ol style="list-style-type: none"> <li>d. Utilização pela expressão oral dos conceitos e vocábulos da saúde ambiental</li> <li>e. Utilização das estruturas gramaticais necessárias e apropriadas na comunicação com outras pessoas</li> <li>f. Utilização, por escrito, dos conceitos e vocábulos da saúde ambiental.</li> </ol>
12.	<p><b>PLANIFICAÇÃO E DESENVOLVIMENTO</b></p> <p><b><u>Objectivos e aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>1. Descrever os diversos princípios e sistemas de planificação ambiental ao nível local e nacional.</li> <li>2. Descrever os instrumentos e os conceitos de planificação</li> <li>3. Aplicar os instrumentos de planificação</li> <li>4. Analisar e comunicar os resultados em termos de quadro de normalização</li> <li>5. Controlar e avaliar os planos para os edifícios para habitação e comercial</li> <li>6. Descrever as actividades ligadas à valorização de um lote</li> <li>7. Aplicar a legislação em vigor para a gestão eficaz das ocupações ilegais ou anárquicas dos lotes.</li> </ol> <p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"> <li>• Os diversos princípios e sistemas de planificação ambiental ao nível local e nacional.</li> <li>• Os instrumentos e os conceitos de planificação</li> <li>• Os instrumentos de planificação</li> <li>• Análise e comunicação dos resultados em termos de quadro de normalização</li> <li>• Controlo e avaliação dos planos para os edifícios de habitação e comercial</li> <li>• As actividades ligadas à valorização de um lote</li> <li>• Aplicação da legislação em vigor para a gestão eficaz das ocupações ilegais ou anárquicas dos lotes.</li> </ul>
13.	<p><b>DESENVOLVIMENTO SUSTENTÁVEL</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>1. Descrever os conselhos e as recolhas de instruções internacionais</li> <li>2. Descrever o quadro nacional e internacional de saúde ambiental</li> <li>3. Descrever os quadros nacionais e internacionais que apoiam o desenvolvimento sustentável (Agenda 21, Declaração do Rio, ODM, CMDS, NEPAD)</li> <li>4. Avaliar os projectos de construção em conformidade com os princípios do desenvolvimento sustentável</li> <li>5. Aplicar os quadros nacionais e internacionais que apoiam o desenvolvimento sustentável (Agenda 21, Declaração do Rio, ODM, CMDS, NEPAD)</li> </ol>

	<p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"> <li>• Os conselhos e as recolhas de instruções internacionais</li> <li>• O quadro nacional e internacional de saúde ambiental</li> <li>• Os quadros nacionais e internacionais que apoiam o desenvolvimento sustentável (Agenda 21, Declaração do Rio, ODM, CMDs, NEPAD)</li> <li>• Os projetos de construção em conformidade com os princípios do desenvolvimento sustentável</li> <li>• Os quadros nacionais e internacionais que apoiam o desenvolvimento sustentável (Agenda 21, Declaração do Rio, ODM, CMDs, NEPAD)</li> </ul>
14.	<p><b>ALTERAÇÕES CLIMÁTICAS</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>1. Integrar, nos conhecimentos atuais, as bases da ciência das alterações climáticas e os múltiplos desafios ambientais, sociais, políticos e económicos decorrentes deste fenómeno</li> <li>2. Aplicar uma abordagem interdisciplinar e sistémica a problemas específicos no quadro das alterações climáticas</li> <li>3. Familiarizar-se com estas e lançar um olhar crítico às fontes de informação relativamente à problemática das alterações climáticas.</li> </ol> <p><b><u>Conteúdo</u></b></p> <p>Ciência das alterações climáticas, retroações do sistema climático, ciclo do carbono, impacto das alterações climáticas, subida do nível do mar, medidas de adaptação e de mitigação, Protocolo de Kyoto, fontes e meios de redução de emissões de gás com efeito de estufa, estudos regionais de casos, desafios sociais, económicos e políticos em torno das alterações climáticas. Variações climáticas (antigas variações, recentes aquecimentos climáticos globais, seca e desertificação) factores (causas astronómicas, deslocação dos continentes para os pólos, crises vulcânicas) retroacção, consequências ligadas à humanidade; consequências sanitárias.</p>
15.	<p><b>GESTÃO DAS CATÁSTROFES E DO BIO-TERRORISMO</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>1. Definir os conceitos</li> <li>2. Descrever o papel do profissional de saúde ambiental na gestão dos desastres ou catástrofes</li> <li>3. Aplicar medidas de prevenção de desastres</li> <li>4. Executar planos para a prevenção de catástrofes</li> <li>5. Avaliar, de forma crítica, os serviços de gestão de socorros</li> <li>6. Comunicar com os actores na gestão de catástrofes.</li> </ol> <p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"> <li>• Definição dos conceitos</li> <li>• Descrição do papel do profissional de saúde ambiental na gestão dos desastres ou catástrofes</li> <li>• Aplicação de medidas de prevenção de desastres</li> <li>• Execução de planos para a prevenção de catástrofes</li> <li>• Avaliação, de forma crítica, dos serviços de gestão dos socorros</li> <li>• Comunicação com os actores na gestão de catástrofes</li> </ul>

16.	<p><b>PLANIFICAÇÃO E GESTÃO DE PROJECTOS</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>1. Desenvolver protocolos de projectos em saúde ambiental</li> <li>2. Rever os processos de gestão de projectos na área da saúde</li> <li>3. Gerir os projectos que intervêm na área da saúde ambiental</li> </ol> <p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"> <li>• Desenvolvimento de protocolos de projetos em saúde ambiental</li> <li>• Revisão dos processos de gestão de projectos na área da saúde</li> <li>• Gestão dos projetos que intervêm na área da saúde ambiental</li> </ul>
17.	<p><b>EPIDEMIOLOGIA</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>1. Explicar os factores, a classificação, a génese ou o modo de transmissão das doenças</li> <li>2. Gerir a informação estatística de base (recolha, análise, interpretação e divulgação de resultados)</li> <li>3. Definir os conceitos apropriados utilizados no controlo de doenças</li> <li>4. Aplicar os cinco níveis de prevenção na luta contra as doenças transmissíveis e não transmissíveis</li> </ol> <p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"> <li>• Os fatores, a classificação, a génese ou o modo de transmissão das doenças</li> <li>• Gestão da informação estatística de base (recolha, análise, interpretação e divulgação de resultados)</li> <li>• Definição dos conceitos apropriados utilizados no controlo de doenças</li> <li>• Aplicação dos níveis de prevenção na luta contra as doenças transmissíveis e não transmissíveis</li> </ul>
18.	<p><b>SAÚDE COMUNITÁRIA I</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>1. Definir os conceitos da saúde da população</li> <li>2. Explicar as diferentes técnicas demográficas e sua interpretação</li> <li>3. Descrever as intervenções sanitárias aplicáveis aos diferentes grupos da população</li> <li>4. Identificar, analisar e desenvolver medidas para garantir a igualdade do género (entre os sexos) nas comunidades</li> <li>5. Aplicar as questões morais das diferentes culturas na investigação em matéria de saúde da população</li> <li>6. Pôr em prática as intervenções dos serviços de saúde e da população.</li> </ol> <p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"> <li>• Os conceitos de saúde da população</li> <li>• As diferentes técnicas demográficas e sua interpretação</li> <li>• As intervenções sanitárias aplicáveis aos diferentes grupos da população</li> <li>• Identificação, análise e desenvolvimento de medidas para garantir a igualdade do género (entre os sexos) nas comunidades</li> <li>• As questões morais das diferentes culturas na investigação em matéria de saúde da população</li> <li>• Prática das intervenções dos serviços de saúde e da população</li> </ul>

19.	<p><b>DOENÇAS TRANSMISSÍVEIS E NÃO TRANSMISSÍVEIS</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>1. Explicar as doenças transmissíveis e não transmissíveis</li> <li>2. Descrever a patogenia dos diversos micro-organismos</li> <li>3. Identificar os grupos de risco</li> <li>4. Descrever os efeitos dos incidentes químicos sobre a saúde</li> <li>5. Explicar as doenças tropicais emergentes reaparecidas e negligenciadas</li> <li>6. Estabelecer programas de gestão das doenças contagiosas e não contagiosas</li> <li>7. Avaliar os aspectos toxicológicos das doenças não contagiosas</li> <li>8. Descrever os termos e as definições apropriadas relativamente à investigação sobre as manifestações de intoxicação alimentar e de desencadeamento das doenças</li> <li>9. Analisar, de forma crítica, os programas de gestão das doenças contagiosas e não contagiosas</li> <li>10. Gerir os problemas ligados às águas de natação (de interior e exteriores)</li> </ol> <p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"> <li>• As doenças transmissíveis e não transmissíveis</li> <li>• A patogenia dos diversos microrganismos</li> <li>• Identificação dos grupos de risco</li> <li>• Os efeitos dos incidentes químicos sobre a saúde</li> <li>• As doenças tropicais emergentes reaparecidas e negligenciadas</li> <li>• Adoção de programas de gestão das doenças contagiosas e não contagiosas</li> <li>• Avaliação dos aspetos toxicológicos das doenças não contagiosas</li> <li>• Os termos e as definições apropriadas relativamente à investigação sobre as manifestações de intoxicação alimentar e de desencadeamento das doenças</li> <li>• Análise crítica dos programas de gestão das doenças contagiosas e não contagiosas</li> <li>• Gestão dos problemas ligados às águas de natação (de interior e exteriores)</li> </ul>
20.	<p><b>SISTEMAS DE GESTÃO DA INFORMAÇÃO EM MATÉRIA DE SAÚDE I</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>1. Identificar os elementos do sistema de cuidados de saúde no país, a sua inter-relação, e o papel da informação sanitária</li> <li>2. Compreender a necessidade de adaptar o funcionamento do sistema de informação sanitária às especificidades do sistema nacional de saúde</li> <li>3. Seleccionar a informação para a tomada de decisões e medidas</li> <li>4. Interpretar, utilizar e divulgar a informação sanitária aos diferentes actores</li> <li>5. Integrar a informação no processo de decisão tendo em conta as outras determinantes (políticas, sociais e económicas)</li> </ol> <p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"> <li>• Os elementos do sistema de saúde</li> <li>• As fontes de informação</li> </ul>

	<ul style="list-style-type: none"> <li>• Os indicadores (tipo, qualidade e classificação)</li> <li>• Estatística descritiva e demografia</li> <li>• Recolha de informações: métodos adaptados em função das realidades de terreno e qualidade dos suportes e da recolha</li> <li>• Interpretação da informação sanitária: qualidade, significação e análise</li> <li>• Utilização da informação sanitária</li> <li>• Integração da informação no processo de decisão</li> </ul>
21.	<p><b>PRODUTOS ALIMENTARES: HIGIENE E PATOLOGIA</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>1. Diferenciar as características anatómicas importantes dos diferentes animais abatidos</li> <li>2. Descrever (incluindo a recolha e a análise) as condições fisiológicas e patológicas da doença</li> <li>3. Identificar, avaliar e comunicar (incluindo a recolha e a análise)</li> <li>4. Descrever o quadro nacional e internacional das doenças zoonóticas e importantes e a parasitologia ao nível das aves, dos peixes, dos bovinos e do gado</li> <li>5. Descrever o quadro jurídico nacional e internacional das condições patológicas e fisiológicas das doenças zoonóticas e bovinas, do gado e das aves</li> <li>6. Analisar, de forma crítica, e aplicar o quadro jurídico nacional e internacional para as doenças zoonóticas e importantes</li> <li>7. Descrever o papel e a função das outras agências envolvidas na inspecção da carne, na gestão do abate do gado e no bem-estar dos animais de consumo</li> <li>8. Descrever os princípios da boa prática num matadouro</li> <li>9. Aplicar a planificação de matadouros, a construção e a gestão em termos de normas e diretivas padrão</li> <li>10. Explicar as condições e as necessidades da produção</li> <li>11. Aplicar os princípios da avaliação dos riscos à inspecção da carne e da gestão do matadouro</li> <li>12. Inspeccionar a carne no matadouro</li> <li>13. Identificar os factores práticos em matéria de abate e a legislação que determina a higiene e a qualidade da carne</li> <li>14. Aplicar a higiene e os procedimentos em conformidade com os regulamentos sobre o abate de animais para consumo</li> <li>15. Descrever os agentes microbianos postos em causa na alteração dos alimentos</li> <li>16. Descrever as doenças ligadas ao consumo de alimentos</li> <li>17. Descrever as normas de higiene e de segurança alimentar que devem ser respeitadas</li> <li>18. Aplicar os gestos importantes de higiene alimentar</li> <li>19. Aplicar os princípios de pontos críticos de controlo (HACCP) à cadeia de géneros de origem animal e vegetal.</li> </ol> <p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"> <li>• As características anatómicas importantes dos diferentes animais abatidos</li> <li>• A recolha e a análise, as condições fisiológicas e patológicas da doença</li> <li>• Identificação, avaliação e comunicação</li> <li>• O quadro nacional e internacional das doenças zoonóticas e importantes</li> </ul>

	<p>e a parasitologia ao nível das aves, dos peixes, dos bovinos e do gado</p> <ul style="list-style-type: none"> <li>• O quadro jurídico nacional e internacional das condições patológicas e fisiológicas das doenças zoonóticas e dos bovinos, do gado e das aves</li> <li>• Análise crítica e aplicação do quadro jurídico nacional e internacional para as doenças zoonóticas e importantes</li> <li>• O papel e a função das outras agências envolvidas na inspecção de carne, na gestão do abate do gado e o bem-estar dos animais de consumo</li> <li>• Os princípios da boa prática num matadouro</li> <li>• A planificação de matadouros, a construção e a gestão em termos de normas e diretivas padrão</li> <li>• As condições e as necessidades da produção</li> <li>• Os princípios da avaliação dos riscos à inspecção da carne e da gestão do matadouro</li> <li>• Inspeção da carne no matadouro</li> <li>• Os fatores práticos em matéria de abate e a legislação que determina a higiene e a qualidade da carne</li> <li>• A higiene e os procedimentos em conformidade com os regulamentos sobre o abate de animais para consumo</li> <li>• Cadeia alimentar e segurança alimentar</li> <li>• Doenças hídricas, protecção e controlo da sua epidemiologia</li> <li>• Normas admitidas em higiene alimentar</li> <li>• Autorização para a preparação de alimentos e as indústrias de venda de água potável</li> <li>• Autorização para venda de licores</li> <li>• Organização do programa do seminário sobre a higiene e a segurança alimentar à intenção dos intervenientes nesta área</li> <li>• Procedimento e processo de higiene e de inspecção dos produtos alimentares.</li> </ul>
22.	<p><b>SAÚDE NO TRABALHO</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>1. Descrever as estruturas nacionais de controlo e promoção da saúde e da medicina do trabalho e a relação com as estruturas internacionais</li> <li>2. Fornecer uma explicação sobre a origem da saúde e da medicina do trabalho</li> <li>3. Descrever os princípios da avaliação de riscos</li> <li>4. Descrever os conceitos de base da avaliação e da identificação dos riscos ligados ao trabalho</li> <li>5. Avaliar no local de trabalho : <ul style="list-style-type: none"> <li>• os factores físicos</li> <li>• os factores biológicos</li> <li>• os factores químicos</li> <li>• os factores fisiológicos</li> <li>• os factores ergonómicos</li> </ul> </li> <li>1. Descrever os princípios da inspecção e da auditoria</li> <li>2. Avaliar os pontos seguintes em termos de legislação e de normas internacionais para a avaliação e aferição dos riscos: <ul style="list-style-type: none"> <li>• factores físicos</li> <li>• factores biológicos</li> </ul> </li> </ol>

	<ul style="list-style-type: none"> <li>• fatores químicos</li> <li>• fatores psicológicos</li> <li>• fatores ergonómicos</li> </ul> <ol style="list-style-type: none"> <li>1. Avaliar, de forma crítica, as questões de ordem ética na concepção de saúde e segurança no trabalho</li> <li>2. Avaliar, de forma crítica, os programas de gestão em termos de legislação nacional e internacional e normas</li> <li>3. Gerir a saúde do trabalho e os riscos profissionais que resultam dos seguintes factores no local de trabalho : <ul style="list-style-type: none"> <li>• fatores físicos</li> <li>• fatores biológicos</li> <li>• fatores químicos</li> <li>• fatores psicológicos</li> <li>• fatores ergonómicos</li> <li>• problemas de segurança</li> </ul> </li> <li>1. Avaliar, de forma crítica, os documentos e os sistemas de inspecção/auditoria para a gestão eficaz dos programas de OHS</li> <li>2. Conceber um plano de emergência para gerir os acidentes, os incidentes e as catástrofes</li> <li>3. Tomar uma medida apropriada no que respeita os problemas de ética na saúde e segurança no trabalho.</li> </ol> <p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"> <li>• As estruturas nacionais de controlo e promoção da saúde e da medicina do trabalho e a relação com as estruturas internacionais.</li> <li>• A origem da saúde e da medicina do trabalho</li> <li>• Os princípios da avaliação de riscos</li> <li>• Os conceitos de base da avaliação e da identificação dos riscos</li> <li>• Avaliação dos riscos sanitários no local de trabalho</li> <li>• Os princípios da inspecção e auditoria</li> <li>• Legislação e normas internacionais de avaliação e aferição de riscos</li> <li>• Avaliação crítica das questões de ordem ética na concepção de saúde e segurança no trabalho</li> <li>• Avaliação crítica dos programas de gestão em termos de legislação nacional e internacional e normas</li> <li>• Gestão da saúde no trabalho e dos riscos profissionais</li> <li>• Avaliação crítica dos documentos e dos sistemas de inspecção/auditoria para a gestão eficaz dos programas de OHS.</li> <li>• Conceção de um plano de emergência para gerir os acidentes, os incidentes e as catástrofes</li> <li>• Medidas apropriadas no que respeita os problemas de ética na saúde e segurança no trabalho</li> <li>• Direito do trabalho</li> </ul>
23.	<p><b>VENTILAÇÃO DOS ESTABELECIMENTOS PÚBLICOS E PRIVADOS</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>1. Definir os conceitos de ventilação</li> <li>2. Descrever os diferentes tipos de ventilação</li> <li>3. Executar os cálculos relativos à ventilação para avaliação e resolução dos problemas ligados aos sistemas de ventilação</li> </ol>

	<ol style="list-style-type: none"> <li>Integrar a informação sobre os sistemas de ventilação de um local de trabalho específico na avaliação e gestão dos riscos</li> <li>Discutir as componentes de diversos tipos de sistemas de ventilação e de depuradores de ar.</li> </ol> <p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"> <li>Os conceitos de ventilação</li> <li>Os diferentes tipos de ventilação</li> <li>Os cálculos relativos à ventilação para avaliação e resolução dos problemas ligados aos sistemas de ventilação</li> <li>Integração da informação sobre os sistemas de ventilação de um local de trabalho específico na avaliação e gestão dos riscos</li> <li>As componentes de diversos tipos de sistemas de ventilação e de depuradores de ar.</li> </ul>
24.	<p><b>LUTA CONTRA OS VECTORES DE DOENÇAS</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>Descrever os vectores das doenças ligadas à saúde ambiental</li> <li>Descrever o bionómico em termos da sua fisiologia, ciclo de vida e distribuição</li> <li>Utilizar a investigação para a prevenção e o controlo das doenças transmissíveis</li> <li>Realizar actividades de intervenção contra os vectores de doenças</li> </ol> <p><b><u>Conteúdo</u></b></p> <ol style="list-style-type: none"> <li>Historial das doenças vectoriais</li> <li>Características da transmissão vectorial de uma doença</li> <li>O papel do vector na transmissão vectorial</li> <li>As principais doenças vectoriais</li> <li>Estratégias de luta contra as doenças vectoriais</li> <li>Doenças vectoriais e alterações climáticas</li> <li>Os vectores das doenças ligadas à saúde ambiental</li> <li>A bionómica em termos da sua fisiologia, ciclo de vida e distribuição</li> <li>A investigação para a prevenção e o controlo das doenças transmissíveis</li> <li>Actividades de intervenção contra os roedores e os vectores</li> <li>Definição de agentes patogénicos (bactéria, cogumelos, parasita) e de vectores importantes em saúde pública</li> <li>Exemplos de agentes patogénicos e de vectores</li> <li>Comparação dos métodos de luta contra o parasita/vector, isto é, biológico, físico, químico, genético, para medidas de controlo ambiental (luta integrada)</li> <li>Exemplos de produtos químicos utilizados na luta contra os parasitas da saúde pública</li> <li>Implicações sanitárias de certos produtos químicos utilizados na luta contra os parasitas</li> </ol>
25.	<p><b>EDUCAÇÃO E PROMOÇÃO DA SAÚDE AMBIENTAL</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>Explicar os conceitos de promoção e de educação da saúde</li> <li>Descrever os princípios da promoção da saúde</li> <li>Avaliar e analisar de forma crítica as políticas nacionais e internacionais em matéria de cuidados de saúde</li> <li>Analisar de forma crítica e aplicar os modelos de promoção da saúde</li> </ol>



	<p>5. Fazer uma análise das necessidades para determinar as condições da promoção da saúde</p> <p>6. Iniciar a abordagem e as estratégias privilegiadas de educação relativas ao ambiente.</p> <p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"> <li>• Conceitos de promoção e de educação da saúde</li> <li>• Conceitos de educação relativa ao ambiente, responsabilidade ecológica</li> <li>• Objectivos e actividades da educação relativa ao ambiente</li> <li>• Princípios da promoção da saúde</li> <li>• Avaliação e análise crítica das políticas nacionais e internacionais em matéria de cuidados de saúde</li> <li>• Análise crítica e aplicação dos modelos de protecção da saúde</li> <li>• Análise das necessidades para determinar as condições de promoção da saúde</li> <li>• Actores da educação relativa ao ambiente</li> <li>• Abordagem (a exploração crítica do meio, a resolução colectiva de um problema local e o desenvolvimento de um projecto comunitário) e estratégias privilegiadas da educação relativa ao ambiente.</li> </ul>
26.	<p><b>SISTEMAS DE GESTÃO DA INFORMAÇÃO EM MATÉRIA DE SAÚDE II</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>1. Definir a informação em matéria de saúde, de ambiente e dos sistemas de gestão destas informações</li> <li>2. Descrever os princípios de gestão da informação em matéria de saúde ambiental</li> <li>3. Descrever o ciclo de gestão em matéria de saúde ambiental</li> <li>4. Desenvolver e mostrar as melhores práticas na gestão institucional</li> <li>5. Desenvolver os instrumentos eficazes de recolha de dados</li> <li>6. Desenvolver, aplicar e avaliar as componentes de HIMS em matéria de saúde ambiental</li> <li>7. Analisar e interpretar os dados</li> <li>8. Utilizar os dados para uma planificação eficaz das actividades de saúde ambiental.</li> </ol> <p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"> <li>• Os conceitos de base do Sistema de Informação Ambiental, infra-estrutura física e lógica, armazenamento de dados, etc.</li> <li>• Análise e conceção de sistemas de informação</li> <li>• Abordagem metodológica dos sistemas de informação para o urbanismo</li> <li>• O sistema de informação ambiental</li> <li>• A informação geográfica (sistema de informação geográfica) e os tipos de dados espaciais, sistema de gestão de dados, cartografia de um território, aquisição e preparação de dados especiais, iniciação à ILWIS e outros programas adaptados, análise espacial com ILWIS : operação de retirada de reclassificação e de medida</li> <li>• Sensibilização para a segurança dos sistemas de informação de rotina</li> </ul>
27.	<p><b>SAÚDE COMUNITÁRIA II</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>1. Explicar os conceitos e as estratégias da saúde comunitária</li> <li>2. Fazer um diagnóstico comunitário</li> <li>3. Analisar a situação sanitária da comunidade</li> </ol>

	<ol style="list-style-type: none"> <li>4. Identificar o problema, definir prioridades</li> <li>5. Definir os objectivos e actividades, mobilizar os recursos para melhorar a situação</li> <li>6. Organizar e conduzir a acção</li> <li>7. Participar na organização comunitária</li> <li>8. Desenvolver um programa de base comunitária</li> <li>9. Seguir e avaliar as actividades de saúde comunitária</li> </ol> <p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"> <li>• Os conceitos de saúde, de saúde pública, de cuidados primários de saúde (CPS) e de saúde comunitária</li> <li>• As ciências humanas e a saúde</li> <li>• As estratégias da saúde comunitária</li> <li>• Diagnóstico comunitário</li> <li>• Estratégias de participação comunitária</li> <li>• Estruturas de participação comunitária</li> <li>• Desenvolvimento de um programa de base comunitária</li> <li>• Seguimento e avaliação das actividades de saúde comunitária</li> </ul>
28.	<p><b>GESTÃO DOS LIXOS</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>1. Explicar os princípios da biodegradação dos lixos</li> <li>2. Definir as terminologias relativas à gestão dos lixos</li> <li>3. Explicar os procedimentos, princípios e práticas exigidas para a recolha ou tratamento dos lixos</li> <li>4. Avaliar as opções de tratamento tais como a incineração, a pirólise, o autoclave e a compostagem</li> <li>5. Analisar, de forma crítica, os processos ligados às disposições legais, nacional e internacional de gestão dos lixos</li> <li>6. Elaborar estratégias inovadoras realizáveis de minimização de lixos para as comunidades rurais</li> </ol> <p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"> <li>• Os princípios da biodegradação dos lixos</li> <li>• A terminologia sobre a gestão dos lixos</li> <li>• Os procedimentos, princípios e práticas exigidas desde a recolha ao tratamento dos lixos</li> <li>• Avaliação das opções de tratamento tais como a incineração, a pirólise, o autoclave e a compostagem</li> <li>• Os processos ligados às disposições legais, nacionais e internacionais de gestão dos lixos</li> <li>• Estratégias inovadoras realizáveis de minimização de lixos para as comunidades rurais</li> </ul> <p><b>Opções práticas simples da gestão dos resíduos líquidos e sólidos</b></p> <ul style="list-style-type: none"> <li>• Definição de conceitos</li> <li>• Classificação dos lixos</li> <li>• Características dos lixos</li> <li>• Método de disposição de resíduos sólidos especialmente para a incineração e o aterro</li> <li>• Gestão dos lixos (hospitalar) provenientes dos cuidados de saúde</li> <li>• Novos conceitos na gestão dos lixos sólidos, isto é o dever de cuidar da sua</li> </ul>

	<ul style="list-style-type: none"> <li>reutilização, reciclagem e recuperação</li> <li>• Recolha e disposição das águas de esgoto</li> <li>• Definição das águas residuais e dos excrementos</li> <li>• Exemplos de águas residuais</li> <li>• Componentes e constituintes dos lixos líquidos</li> <li>• Métodos de gestão das águas residuais e dos excrementos</li> <li>• Gestão das lamas de drenagem</li> </ul>
29.	<p><b>LEIS DE SAÚDE AMBIENTAL E PROCESSOS LEGAIS</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>1. Descrever a hierarquia e os processos de formulação de convenções, leis e regulamentos decorrentes do direito e da saúde ambiental</li> <li>2. Identificar os principais instrumentos legais internacionais e nacionais relativos ao ambiente e à saúde ambiental</li> <li>3. Interpretar o quadro nacional e internacional legal (incluindo protocolos e convenções) para a comunidade</li> <li>4. Descrever o papel da EHO e outros profissionais envolvidos na aplicação da lei</li> <li>5. Descrever os processos legais em matéria de saúde ambiental</li> </ol> <p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"> <li>• A hierarquia e os processos de formulação de convenções, leis e regulamentos decorrentes do direito e da saúde ambiental</li> <li>• Os principais instrumentos legais internacionais e nacionais relativos ao ambiente e à saúde ambiental</li> <li>• Interpretação do quadro nacional e internacional legal (incluindo protocolos e convenções) para a comunidade</li> <li>• O papel da EHO e outros profissionais envolvidos na aplicação da lei</li> <li>• Os processos legais em matéria de saúde ambiental</li> </ul>
30.	<p><b>GESTÃO DO AR</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>1. Aplicar os princípios e as técnicas de controlo e de amostragem</li> <li>2. Avaliar as respetivas opções relativas à avaliação da poluição e do controlo do ar</li> <li>3. Avaliar a radiação e a radioactividade no quadro da poluição do ambiente</li> <li>4. Interpretar as medidas e fazer controlos e relatórios sobre as queixas relativas aos danos (ruídos) em matéria de ambiente</li> <li>5. Avaliar o impacto (avaliação das incidências) da poluição atmosférica nos humanos, animais e plantas</li> <li>6. Rever, de forma crítica, os processos ligados às disposições legais nacionais e internacionais da gestão da qualidade do ar</li> <li>7. Avaliar e comunicar os inventários de emissão.</li> </ol> <p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"> <li>• Os princípios e as técnicas de controlo e de amostragem</li> <li>• As opções respetivas relativas à avaliação da poluição e do controlo do ar</li> <li>• Avaliação da radiação e a radioactividade no quadro da poluição do ambiente</li> <li>• Interpretação das medidas e dos controlos e relatórios sobre as queixas relativas aos danos (ruídos) em matéria de ambiente</li> <li>• Avaliação do impacto (avaliação das incidências) da poluição atmosférica nos humanos, animais e plantas</li> </ul>

	<ul style="list-style-type: none"> <li>Os processos ligados às disposições legais nacionais e internacionais da gestão da qualidade do ar</li> <li>Avaliação e comunicação dos inventários de emissão.</li> </ul>
31.	<p><b>RECURSOS HÍDRICOS E GESTÃO DA QUALIDADE</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>1. Descrever a gestão da qualidade da água</li> <li>2. Descrever a diferença entre as características químicas, físicas e biológicas da água</li> <li>3. Estabelecer a diferença entre a água superficial, a purificação da água potável e o tratamento das águas residuais</li> <li>4. Descrever a importância da água</li> <li>5. Identificar e descrever a regulamentação nacional e internacional relativamente à segurança da água</li> <li>6. Descrever como validar as estratégias adequadas de distribuição e tratamento de água</li> <li>7. Descrever o processo de tratamento da água das piscinas</li> <li>8. Desenvolver e aplicar os planos dos sistemas de alimentação da água</li> <li>9. Compreender os diversos métodos de higiene e de gestão da água ao nível das famílias e das comunidades</li> <li>10. Compreender os critérios e as normas internacionais de gestão da qualidade da água</li> <li>11. Aplicar os procedimentos e técnicas de amostragem da água</li> <li>12. Aplicar as estratégias adequadas de controlo da qualidade da água potável</li> </ol> <p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"> <li>A gestão integrada dos recursos hídricos</li> <li>A gestão da qualidade da água</li> <li>As características químicas, físicas e biológicas da água</li> <li>A diferença entre a água superficial, a purificação da água potável e o tratamento das águas residuais</li> <li>A importância da água</li> <li>A regulamentação nacional e internacional relativamente à segurança da água</li> <li>A validação das estratégias adequadas de distribuição e tratamento de água</li> <li>O tratamento dos efluentes e da água das piscinas</li> <li>Os planos dos sistemas de alimentação de água</li> <li>Os diversos métodos de higiene e de gestão da água ao nível das famílias e das comunidades</li> <li>Os critérios e as normas internacionais de gestão da qualidade da água</li> <li>Procedimentos e técnicas de aferição da água</li> <li>Epidemiologia das doenças hídricas ou das doenças ligadas à água</li> <li>Estratégias adequadas de controlo da qualidade da água potável</li> </ul>
32.	<p><b>LUTA CONTRA A POLUIÇÃO</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>1. Identificar, descrever e aplicar os conselhos e os códigos específicos locais, nacionais e internacionais de luta contra a poluição</li> <li>2. Aplicar os procedimentos para a gestão de todo o tipo de lixo, isto é lixo hospitalares, lixo domésticos, lixo industriais, resíduos sólidos, líquidos e</li> </ol>

	<p>lixos perigosos</p> <ol style="list-style-type: none"> <li>3. Explicar os princípios e a importância da higiene pessoal e ambiental na luta contra a poluição</li> <li>4. Descrever os princípios, as práticas e as tecnologias adequadas da higiene</li> <li>5. Explicar a abordagem de equipa pluridisciplinar para a higiene</li> <li>6. Descrever os sistemas de controlo da poluição relativamente a uma comunidade específica</li> <li>7. Descrever abordagens participativas na gestão da higiene ao nível das famílias e comunidades</li> <li>8. Descrever o processo da biodegradação no ambiente (ar, água e terra)</li> <li>9. Aplicar as tecnologias adequadas de prevenção da poluição.</li> </ol> <p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"> <li>• A análise do ciclo de vida</li> <li>• Os conselhos e os códigos específicos locais, nacionais e internacionais de luta contra a poluição</li> <li>• Os procedimentos de gestão de todo o tipo de lixos, isto é lixos hospitalares, lixos domésticos, lixos industriais, resíduos sólidos, líquidos e lixos perigosos</li> <li>• Os princípios e a importância da higiene pessoal e ambiental na luta contra a poluição</li> <li>• Os princípios, as práticas e as tecnologias adequadas da higiene</li> <li>• A abordagem de equipa pluridisciplinar para a higiene</li> <li>• Sistemas de controlo da poluição numa comunidade específica</li> <li>• Abordagens participativas na gestão da higiene ao nível das famílias e das comunidades</li> <li>• O processo da biodegradação no ambiente (ar, água e terra)</li> <li>• As tecnologias adequadas de prevenção da poluição</li> </ul>
33.	<p><b>EDUCAÇÃO E PROMOÇÃO DA SAÚDE</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>1. Definir o conceito de educação e de promoção da saúde</li> <li>2. Explicar os conceitos de educação e de promoção da saúde no quadro da luta contra a poluição</li> <li>3. Analisar as políticas nacionais e internacionais sobre a protecção do ambiente e a sustentabilidade</li> <li>4. Aplicar os métodos participativos na educação sanitária</li> </ol> <p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"> <li>• Os conceitos de educação e de promoção da saúde</li> <li>• Os conceitos de educação e de promoção da saúde no quadro da luta contra a poluição</li> <li>• As políticas nacionais e internacionais sobre a protecção do ambiente e a sustentabilidade</li> <li>• As estratégias da comunicação (IEC) na educação sanitária</li> <li>• A importância dos métodos participativos</li> <li>• A comunicação ao serviço da saúde pública</li> <li>• Alguns princípios adoptados pela comunicação em saúde pública</li> <li>• Papel e limites da publicidade</li> <li>• A metodologia de elaboração de uma campanha de educação para a promoção da saúde</li> </ul>

34.	<p><b>ECO-TOXICOLOGIA</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>1. Definir os conceitos</li> <li>2. Determinar o impacto das substâncias tóxicas no ambiente</li> <li>3. Desenvolver medidas de controlo do impacto das toxinas ambientais no ambiente</li> <li>4. Explicar as definições e as equações relativas à toxicologia e a relação de resposta à dose dada</li> <li>5. Classificar os efeitos tóxicos em termos de tempo de reacção, os que provocam irritações e o efeito no corpo</li> <li>6. Explicar o conceito de avaliação de tempo</li> <li>7. Definir o conceito de prevenção dos riscos profissionais</li> <li>8. Comparar esses aspetos com a legislação e as normas nacionais e internacionais</li> <li>9. Avaliar os factores de risco profissionais utilizando os princípios de avaliação do tempo</li> <li>10. Explicar o efeito de diversas substâncias tóxicas no corpo</li> <li>11. Integrar a informação toxicológica nas avaliações dos riscos e nos planos de gestão.</li> </ol> <p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"> <li>• Os conceitos chave da eco-toxicologia</li> <li>• O impacto das substâncias tóxicas no ambiente</li> <li>• Medidas de controlo do impacto das toxinas ambientais no ambiente</li> <li>• As definições e as equações relativas à toxicologia e a relação de resposta à dose dada</li> <li>• Os efeitos tóxicos em termos de tempo de reacção, os que provocam irritações, o efeito no corpo</li> <li>• O conceito de avaliação do tempo</li> <li>• O conceito de prevenção dos riscos profissionais</li> <li>• A legislação e as normas nacionais e internacionais</li> <li>• Os fatores de risco profissionais utilizando os princípios de avaliação do tempo</li> <li>• O efeito de diversas substâncias tóxicas no corpo</li> <li>• A informação toxicológica nas avaliações dos riscos e nos planos de gestão</li> </ul>
35.	<p><b>GESTÃO DOS CADAVERES E CASAS MORTUÁRIAS</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>1. Aplicar os métodos de gestão de cadáveres e casas mortuárias com toda a segurança</li> <li>2. Avaliar os equipamentos para a conservação e o transporte de cadáveres</li> <li>3. Descrever os métodos e as práticas pelas quais pode ser feita uma exumação</li> <li>4. Descrever a gestão dos cadáveres não reivindicados</li> <li>5. Descrever os métodos de transporte de cadáveres segundo as leis nacionais e internacionais</li> </ol> <p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"> <li>• Os métodos seguros de gestão de cadáveres e casas mortuárias</li> <li>• Os equipamentos de conservação e de transporte de cadáveres</li> <li>• Os métodos e as práticas de exumação</li> <li>• A gestão dos cadáveres não reivindicados</li> </ul>

	<ul style="list-style-type: none"> <li>Os métodos de transporte de cadáveres segundo as leis nacionais e internacionais</li> </ul>
36.	<p><b>INSPECÇÃO SANITÁRIA DOS LOCAIS</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>Definir os conceitos de base</li> <li>Determinar as medidas a tomar antes da escolha da implantação de um lote e a construção de um edifício</li> <li>Aplicar políticas, regulamentos e leis relativas à habitação e à higiene dos locais do país</li> <li>Aplicar os procedimentos de inspecção dos locais e a redução dos danos.</li> </ol> <p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"> <li>Definição e diferenciação entre casa ideal e habitação</li> <li>Conceito e condições de uma casa ideal</li> <li>Precauções a tomar antes da escolha da implantação do lote e a construção de um edifício</li> <li>Procedimentos de inspeção dos locais e de redução dos danos</li> <li>Políticas, regulamentos e leis relativas à habitação e à higiene dos locais do país</li> <li>Inspeção sanitária dos locais</li> </ul>
37.	<p><b>HIGIENE HOSPITALAR</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>Definir os conceitos</li> <li>Explicar o interesse da higiene hospitalar</li> <li>Desenvolver as medidas de luta contra as infeções hospitalares</li> </ol> <p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"> <li>Definição dos conceitos</li> <li>Interesse da higiene hospitalar</li> <li>Medidas de luta contra as infeções hospitalares</li> </ul>
38.	<p><b>HABITAÇÃO</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>Explicar a relação entre a habitação e a saúde</li> <li>Descrever o papel de um profissional de saúde ambiental em matéria de educação</li> <li>Explicar o conceito de habitação social</li> <li>Descrever as condições especiais do local de residência</li> <li>Desenvolver mensagens educativas</li> <li>Comunicar as mensagens de IEC (Informação, Educação e Comunicação) relativas à boa habitação</li> <li>Avaliar os riscos que a construção causa à saúde</li> <li>Analisar a informação de uma avaliação de riscos da habitação</li> <li>Aplicar intervenções eficazes para uma melhor habitação</li> <li>Informar sobre o estado da habitação de acordo com o estipulado na legislação e regulamentos em vigor.</li> </ol> <p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"> <li>Relação entre habitação e saúde</li> <li>Papel de um profissional da saúde ambiental em matéria de educação</li> </ul>

	<ul style="list-style-type: none"> <li>• O conceito de habitação social</li> <li>• Condições especiais em matéria do local de residência</li> <li>• A análise do ar interior e das variedades de poluição: agentes físicos e contaminantes químicos ou microbiológicos ligados aos edifícios, equipamentos, ao ambiente exterior imediato e ao comportamento dos ocupantes, aos produtos de construção, mobiliário, manutenção, equipamento de aquecimento e de ar condicionado</li> <li>• Mensagens educativas</li> <li>• Mensagens de IEC (Informação, Educação e Comunicação) relativas à boa habitação</li> <li>• Avaliação dos riscos que a construção causa à saúde</li> <li>• Análise da informação de uma avaliação de riscos da habitação</li> <li>• Intervenções eficazes para uma melhor habitação</li> <li>• Informação sobre o estado da habitação de acordo com o estipulado na legislação e regulamentos apropriados</li> </ul>
39.	<p><b>ETICA E CÓDIGO DE DEONTOLOGIA</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>1. Definir os conceitos básicos</li> <li>2. Descrever as normas e os princípios de deontologia em saúde ambiental</li> <li>3. Explicar a integridade científica e profissional e os conflitos de interesse</li> <li>4. Descrever a História e a organização da saúde ambiental</li> <li>5. Aplicar os princípios éticos ligados à saúde ambiental</li> </ol> <p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"> <li>• Definição de saúde ambiental</li> <li>• Definição da ética e dos conceitos de saúde ambiental</li> <li>• Normas e os princípios de deontologia em saúde ambiental</li> <li>• Integridade científica e profissional e conflitos de interesse</li> <li>• História e evolução da saúde ambiental</li> <li>• Evolução da protecção em saúde ambiental</li> <li>• Necessidade de formação e admissão do quadro profissional médio e a sua importância na profissão da saúde ambiental</li> <li>• Ética profissional exigida ao quadro profissional relativamente ao seu comportamento, moral e atitude para com o público, a sua forma de vestir e o seu respeito pelos superiores hierárquicos</li> <li>• Princípios éticos ligados à saúde ambiental dando especial atenção ao registo, licença e participação no programa bem como a acção de evitar vícios negativos tais como o atraso no serviço, o absentismo e o abuso do álcool durante as horas de serviço, etc</li> </ul>
40.	<p><b>REDACÇÃO ADMINISTRATIVA</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>1. Redigir os vários suportes de comunicação administrativa (relatórios, correspondência, actas etc.)</li> </ol> <p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"> <li>• Redacção dos vários suportes de comunicação administrativa (relatórios, correspondência, actas etc.)</li> </ul>



41.	<p><b>ESTUDO DE IMPACTO AMBIENTAL</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>2. Descrever as diversas terminologias de EIA</li> <li>3. Identificar os actores envolvidos nos processos de EIA</li> <li>4. Identificar os diferentes tipos de desenvolvimentos em que está envolvido o EIA</li> <li>5. Compreender como conceber, conduzir, avaliar e interpretar as avaliações dos problemas de desenvolvimento</li> <li>6. Indicar os métodos para determinar os problemas ligados ao desenvolvimento dos projectos</li> <li>7. Compreender como prever os futuros problemas de desenvolvimento</li> <li>8. Compreender como avaliar ou medir os problemas de saúde no desenvolvimento</li> <li>9. Desenvolver e avaliar sistemas de gestão do ambiente, por exemplo OIN 14001</li> <li>10. Descrever os princípios e os processos para a realização de auditorias na área do ambiente</li> <li>11. Descrever como redigir uma auditoria de EIA e o relatório de avaliação</li> <li>12. Avaliar a relação interna entre as várias componentes do ambiente e as suas consequências relativas</li> </ol> <p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"> <li>• As diversas terminologias de EIA</li> <li>• Os atores envolvidos nos processos de EIA</li> <li>• Os diferentes tipos de desenvolvimentos em que está envolvido o EAI</li> <li>• Conceção, condução, avaliação e interpretação das avaliações dos problemas de desenvolvimento</li> <li>• Os métodos para determinar os problemas ligados ao desenvolvimento de projetos</li> <li>• Previsão dos futuros problemas de desenvolvimento</li> <li>• Avaliação ou medida dos problemas de saúde no desenvolvimento</li> <li>• Os sistemas de gestão do ambiente por exemplo OIN 14001</li> <li>• Os princípios e os processos para a realização de auditorias na área do ambiente</li> <li>• Redação de uma auditoria de EIA e o relatório de avaliação</li> <li>• A relação interna entre as várias componentes do ambiente e as suas consequências relativas</li> <li>• Instrumentos de avaliação ambiental, as características do EIA, procedimento de realização do EIA, procedimento administrativo do EIA, como fazer um EIA, os instrumentos de avaliação do impacto, abordagem metodológica de avaliação dos impactos ambientais, instrumentos de avaliação do impacto, ficha do impacto, realização da ficha de medida do impacto, plano de gestão ambiental.</li> </ul>
42.	<p><b>GESTÃO DA SEGURANÇA</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>1. Definir os conceitos relativos à segurança</li> <li>2. Explicar as teorias de prevenção dos acidentes</li> <li>3. Distinguir o risco do perigo</li> <li>4. Avaliar os riscos sanitários ligados aos locais de trabalho e na população</li> </ol>

	<p>em geral</p> <ol style="list-style-type: none"> <li>5. Conceber um programa de gestão de riscos de segurança</li> <li>6. Avaliar, de forma crítica, os programas de gestão em termos de legislação nacional e internacional e das normas</li> <li>7. Comparar os riscos profissionais e a medicina do trabalho no local de trabalho</li> <li>8. Desenvolver ações de segurança sanitária</li> </ol> <p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"> <li>• Os conceitos relativos à segurança</li> <li>• As teorias de prevenção dos acidentes</li> <li>• O risco e o perigo</li> <li>• Os riscos sanitários ligados aos locais de trabalho e à população em geral</li> <li>• Conceção de um programa de gestão de riscos em matéria de segurança</li> <li>• Avaliação crítica dos programas de gestão em termos de legislação nacional e internacional e as normas</li> <li>• Comparação dos riscos profissionais e a medicina do trabalho no local de trabalho</li> <li>• Ações de segurança sanitária</li> </ul>
43.	<p><b>BIOESTATÍSTICA E METODOLOGIA DE INVESTIGAÇÃO</b></p> <p><b><u>Objectivos de aprendizagem</u></b></p> <ol style="list-style-type: none"> <li>1. Definir os conceitos</li> <li>2. Fazer o historial da bio-estatística</li> <li>3. Aplicar os princípios gerais das estatísticas nos sistemas de gestão do serviço de saúde</li> <li>4. Desenvolver os protocolos de investigação e os instrumentos de recolha de dados</li> <li>5. Rever os relatórios de investigações científicas em saúde ambiental</li> <li>6. Avaliar as necessidades da comunidade e submete-las aos actores da área</li> <li>7. Realizar a investigação para uma dissertação científica</li> </ol> <p><b><u>Conteúdo</u></b></p> <ul style="list-style-type: none"> <li>• Os conceitos</li> <li>• O historial da bioestatística</li> <li>• Fundamentos conceptuais dos métodos estatísticos</li> <li>• Introdução às técnicas estatísticas elementares (estatísticas descritivas e exploratórias, cálculo de probabilidades, inferências estatísticas)</li> <li>• Os princípios gerais das estatísticas nos sistemas de gestão do serviço de saúde</li> <li>• As bases de conceptualização de um trabalho de investigação</li> <li>• Os protocolos de investigação e os instrumentos de recolha de dados</li> <li>• Os relatórios de investigações científicas em saúde ambiental</li> <li>• Avaliação das necessidades da comunidade e sua apresentação aos atores da área</li> <li>• Etapas da investigação para uma dissertação científica.</li> </ul>
44.	<b>ESTÁGIO EM ENGENHARIA CIVIL : 1 MÊS</b>
45.	<b>ESTÁGIO EM HIGIENE DO AMBIENTE: 1 MÊS</b>
46.	<b>ESTÁGIO PRÁTICO DE APLICAÇÃO : 3 MESES</b>
47.	<b>REDACÇÃO E APRESENTAÇÃO DO RELATÓRIO DA MONOGRAFIA</b>

## **ANEXO : AS MODALIDADES DE AVALIAÇÃO SEGUNDO O SISTEMA LMD**

### **I. AVALIAÇÃO DAS APTIDÕES**

As aptidões e as aquisições de conhecimentos são avaliadas semestralmente, seja por um controlo contínuo e regular, seja por um exame final ou pelos dois modos combinados.

#### **O controlo contínuo**

- Incide sobre questões pontuais para sondar o nível de compreensão do estudante.
- Diz respeito a questões ligadas ao curso, exercícios, TP, trabalho pessoal.
- É realizado em TD/TP num período limitado (geralmente 20 minutos).
- Cada uma destas avaliações intervém na nota final da matéria segundo uma ponderação fixada no início do semestre.

#### **O exame de fim de semestre / recuperação**

Incide, segundo as matérias, nos conhecimentos adquiridos durante o semestre. A sua duração é fixada pelo estabelecimento de ensino.

### **II. AVALIAÇÃO DA MATÉRIA**

- A nota de uma matéria compreende as notas do controlo contínuo e as notas do exame
- Obtém-se a passagem numa matéria se a nota obtida for igual ou superior a 10/20.

### **III. AVALIAÇÃO DA UE**

- A aquisição da UE depende da aquisição de todas as matérias que a compõem
- A UE também pode ser adquirida por compensação se a média de todas as notas obtidas nas matérias que a compõem, ponderadas dos seus respectivos coeficientes, for igual ou superior a 10/20.

### **IV. AVALIAÇÃO DO SEMESTRE**

- Todo o estudante que obtiver todas as UE passa no semestre
- A passagem do semestre pode igualmente ser feita por compensação entre as diferentes UE que o compõem, ponderadas dos seus coeficientes respetivos. Neste caso, a passagem do semestre ocorre se a média compensada for igual ou superior a 10/20.

### **V. AVALIAÇÃO DO ANO**

A passagem do ano académico depende da passagem nos dois semestres. A passagem do ano também pode ser feita por compensação. Permite a passagem do ano (L1, L2 ou L3) através do cálculo da média das notas das UE que compõem esse ano, afectadas aos seus respectivos coeficientes. Se esta média for superior ou igual a 10/20, o estudante obtém os 60 créditos do ano.

#### **Sessão de recuperação**

Todo o estudante não admitido na primeira sessão, apresenta-se à sessão de recuperação para provas nas matérias em que não obteve aprovação nos semestres.

A nota final escolhida para a matéria será a melhor das médias entre a primeira sessão e a sessão de recuperação. Todo o estudante que não tiver obtido uma média compensada

superior ou igual a 10/20 depois da sessão de recuperação, conserva os créditos das UE e das matérias em que obteve uma média superior ou igual a 10/20.

### **Organização da recuperação do ano em curso**

A recuperação dos débitos anteriores foi já abordada anteriormente. Aqui trata-se das recuperações do ano em curso (Semestre 1 : S1 e Semestre 2 : S2). É preciso:

- Realizar a recuperação do S1 no fim do S1 e a do S2 no fim do S2, ou
- Organizar a recuperação dos dois semestres no fim do S2.

A escolha de uma ou outra possibilidade implica a definição de uma estratégia conhecida de todos no início do ano universitário.

## **VI. PROGRESSÃO NOS ESTUDOS**

### **❖ Passagem de L1 para L2**

#### ***CASO 1 : CAPITALIZAÇÃO***

O estudante é admitido no segundo ano se validou os dois semestres do primeiro ano do ciclo de formação.

#### ***CASO 2 : COMPENSAÇÃO***

O estudante pode ser autorizado a continuar as matérias do segundo ano do ciclo de formação se validar pelo menos 50% dos créditos do primeiro ano, dos quais pelo menos 1/3 num semestre. Então, deve inscrever-se de novo nas matérias não adquiridas das UE não adquiridas no primeiro ano.

### **❖ Passagem de L2 para L3**

#### ***CASO 1 : CAPITALIZAÇÃO***

O estudante é admitido no terceiro ano se validou os quatro primeiros semestres do ciclo de formação.

#### ***CASO 2 : COMPENSAÇÃO***

A progressão para o 3º ano pode ser autorizada para qualquer estudante que justifique pelo menos 90% dos créditos dos dois primeiros anos e que tenha validado todas as UE fundamentais indispensáveis à prossecução dos estudos em especialidade. Neste caso, o estudante deve voltar a inscrever-se nas matérias não adquiridas das UE não adquiridas nos quatro primeiros semestres.

## **VII. EXAME DE CERTIFICAÇÃO**

É feito no fim da formação (no fim do terceiro ano). A obtenção do diploma é condicionado por:

- Aquisição dos créditos necessários para cada um dos seis (6) semestres.
- Aquisição da média de 10/20. Todavia, a escala de notação pode ser de 0 a 100%.

### **APRECIÇÃO**

(0 a 10) = Reprovação

(10 a 12) = Aprovado com a nota mínima (Sofrível)

(12 a 14) = Aprovado com a nota Suficiente

(14 a 16) = Aprovado com a nota Bom

(16 a 20) = Aprovado com a nota Muito Bom