REPUBLIQUE DU CAMEROUN
*Paix – Travail – Patrie*

REPUBLIC OF CAMEROON
*Peace – Work - Fatherland*

# MINISTERE DES ENSEIGNEMENTS SECONDAIRES
*MINISTRY OF SECONDARY EDUCATION*

**INSPECTION GENERALE DES ENSEIGNEMENTS**
*INSPECTORATE GENERAL OF EDUCATION*

# GEOLOGY SYLLABUS

## *Forms 4 and 5*







***Observer son environnement pour mieux orienter ses choix de formation et réussir sa vie***

**INSPECTION DE PEDAGOGIE CHARGEE DE L'ENSEIGNEMENT DES SCIENCES**
*INSPECTORATE OF PEDAGOGY IN CHARGE OF SCIENCES*

***December 2014***

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**Order N° 4199/14 /MINESEC/ IGE ……..** - 9 DEC 2014

**To outline the syllabuses for Form III, Form IV and Form V of Secondary General Education.**

**THE MINISTER OF SECONDARY EDUCATION,**

**Mindful of the Constitution;**
**Mindful of the Law N° 98/004 of 14 April 1998 to lay down Guidelines for Education in Cameroon;**
**Mindful of Decree N°2011/408 of 9 December 2011 to reorganise the Government;**
**Mindful of Decree N°2011/410 of 9 December 2011 to form the Government;**
**Mindful of Decree N°2012/267 of 11 June 2012 to organise the Ministry of Secondary Education;**

**HEREBY ORDERS AS FOLLOWS:**

**Article 1**: The syllabuses for Form III, Form IV and Form V of Secondary General Education shall be outlined as follows:

## PREFACE

## SYLLABUSES FOR 21ST CENTURY CAMEROON

At the beginning of this millennium, as Cameroon chooses to become an emerging nation by the year 2035, its secondary education sector faces many challenges. It should:

- Offer quality training and education to most young Cameroonians within a context marked by large classes in primary education;
- Prepare them for smooth insertion into a more demanding job market worldwide, through a pertinent teaching /learning process.

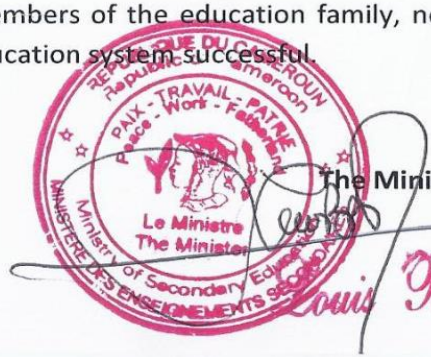
In addition, training tools have significantly evolved in their conception and implementation. A school that was mostly based on contextualised knowledge acquisition has given room, all over the world, for a school that aims at empowering learners to help them cope with complex and diversified real life situations. Instead of a school cut off from society, we now have a school deeply rooted in a society that takes into account sustainable development, local knowledge and cultures.

The implementation of this new school ,prescribed by the Law to lay down guidelines for education in Cameroon, and the necessity for socio-professional insertion require the adoption of a pedagogic paradigm for the development of syllabuses relating to **"The competence based approach with an entry through real life situations ".**

In this perspective, new syllabuses for Secondary General Education, those of Teacher Education and Training Referentials for Technical Education are part of this great change for the re-dynamisation of our education system. They are in line with the implementation of the provisions of Growth and Employment Strategy Paper (DSCE) which, by the year 2020, specifies the minimum amount of knowledge which each Cameroonian is supposed to possess by the time they leave the first cycle of secondary education.

These syllabuses define essential competencies that should be acquired by learners within the first cycle of secondary education, in terms of knowledge, know how and attitudes. They equally define the framework that will enable teachers to organise their pedagogic activities.

While congratulating all those who designed these syllabuses, I hereby exhort all the members of the education family, notably teachers, to acquaint themselves with the new paradigm, to effectively implement it and make the Cameroon education system successful.




**The Minister of Secondary Education**

Louis Bapes Bapes

## FIRST CYCLE SYLLABUS REVIEW

## A PARTICIPATORY AND INNOVATIVE APPROACH

The syllabuses that were drawn up by the Inspectorate General of Education in the Ministry of Secondary Education since 2012 are in accordance with the major guidelines for education in general and secondary education in particular as they are enshrined both in the 1998 law to lay down guidelines for education in Cameroon and in the 2009 Growth and Employment Strategy Paper(DSCE) .

These orientations could be summarised, amongst others, to train within the framework of an emerging Cameroon in the year 2035, citizens that will have a good mastery of the two official languages (English and French), deeply rooted in their cultures but open to a world in search for sustainable development and dominated by Information and Communication Technologies.

Conceived in the various Inspectorates of Pedagogy, and later introduced for trialling in secondary and high schools during the 2012/2013 school year, these syllabuses were developed with the contributions of classroom teachers and teacher trade unionists.

The new syllabuses had to undergo many changes:

- a shift from a skill based approach to a competence based approach through real life situations;
- a shift from a school cut off from society to one that prepares citizens for a smooth insertion into socio-cultural and economic activities ;
- a shift from an evaluation of knowledge to that of competences necessary to sustainable development.

When these new changes and orientations were taken into account, they naturally led to a shift of paradigm within the curriculum reform process. The option we have adopted is the competence based approach through real life situations.

The syllabuses of the first cycle of Secondary General Education are broken down into 5 areas of learning, each of them containing a given number of disciplines as shown in the table below.

| **Areas of learning** | **Disciplines** |
|---|---|
| 1- Languages and Literature | - French<br>- English<br>- Living Languages II<br>- Ancient Languages<br>- Literature(in English and in French) |
| 2- Science and Technology | - Mathematics<br>- The Sciences( Physics, Chemistry, Technology, Life and Earth Sciences)<br>- Computer Science |
| 3- Social Sciences/Humanities | - History<br>- Geography<br>- Citizenship Education |
| 4- Personal Development | - Sports and Physical Education<br>- Manual Labour |
| 5- Arts and National Cultures | - National Languages<br>- National Cultures<br>- Arts |

For 4ème and 3ème (Francophone sub-system of education), the weekly workload and the quota as compared to the total number of hours on the time table (35 h) are displayed in the table below:

| Domaines d'apprentissage | Volume horaire | Quota |
|---|---|---|
| Langues et Littérature | 11 heures | 31,42% |
| Sciences et Technologies | 11 heures | 31,42% |
| Sciences Humaines | 06 heures | 17,14% |
| Arts et cultures nationales | 03 heures | 08,57% |
| Développement personnel | 03 heures | 08,57% |

For the Anglophone sub-system of education (Form III, Form IV and Form V) the same information is summarized in the table below:

| Areas of learning | Weekly workload | Quota |
|---|---|---|
| Languages et Literature | 11 hours | 31,42% |
| Sciences et Technology | 11 hours | 31,42% |
| Social Sciences | 06 hours | 17,14% |
| Art, national languages and cultures | 03 hours | 08,57% |
| Personal development | 03 hours | 08,57% |

L'Inspecteur Général des Enseignements

Dr Evelyne MPOUDI NGOLLE

## END - OF - FIRST CYCLE LEARNER'S EXIT PROFILE

The first cycle of Secondary General Education admits young graduates from primary schools aged between ten and fourteen. Its general objectives are not only to build intellectual, civic and moral skills in these children but also competences and fundamental knowledge which will either enable them to foster their education in the second cycle, or to prepare them for a smooth insertion into the job market after professional training.

Thus, within the framework of these new syllabuses, the learner is expected , after the first cycle of secondary education, to be able to use his/her competences to solve problems through family of situations relating to domains of life as indicated in the table below:

| **N°** | **Domains/Areas of life** | **Families of situations to be treated in the 1st cycle** |
|---|---|---|
| 1 | Family and social life | • Participation in family life<br>• Healthy professional relationships<br>• Social integration |
| 2 | Economic life | • Discovery of income generating activities<br>• Discovery of the job market, social roles, jobs and professions<br>• Self confidence, aspirations, talents, self potential<br>• Practising healthy eating habits |
| 3 | Environment , health and well being | • Preservation of the Environment<br>• Quest for a healthy life style<br>• Choosing and practising a healthy life style |
| 4 | Citizenship | • Mastery of rules and regulations governing the Cameroonian society<br>• Discovery of cultural values and customs of the Cameroonian society |
| 5 | Media and Communications | • Discovery of the media world<br>• Discovery of Information and Communication Technologies |

In order to achieve these objectives, the learner should be able to mobilise , within the various disciplines and constructive areas of learning of the syllabuses, all the pertinent resources in terms of knowledge, know how and attitudes.

The next table gives you a general overview of the afore-mentioned objectives, while the syllabus for each subject unfolds, in details, all the expected competences per level and at the end of the 1st cycle.

| **Areas of Learning** | **Disciplines** | **Expected outcomes at the end of the 1st cycles** |
|---|---|---|
| 1-Languages and Literature | **Living languages:**<br>English,<br>French ,<br>German,<br>Italian,<br>Spanish,<br>Chinese,<br>Etc. | **French and English , L1**<br>Receptive skills: reading and listening<br>Read in an autonomous way, different types of texts related to areas of life as defined in the syllabus;<br>Listen and understand various texts related to the above mentioned areas of life<br>Productive skills: speaking and writing<br>Produce various types of texts , of average length related to these areas of life;<br>Language tools: appropriate use of various language tools in order to produce and read types of texts related to that level; |
| | English to Francophone learners<br><br>French to Anglophone learners | Communicate accurately and fluently using all four basic skills in language learning;<br>Be able to transfer knowledge learnt in class to real life situations out of the classroom;<br>Be able to cope and survive in problem solving situations; |
| | | **Living languages II**<br>Receptive skills: reading and listening<br>Read and understand simple texts on social life, citizenship, the environment, well being and health, media etc..<br>Listen and get oral information in order to simply interact during communication situations related the various domains of life.<br>Productive skills: speaking and writing<br>Sing, recite, dramatise , orally answer questions related to the various domains of life as defined in the syllabus;<br>Write short passages on various familiar topics. |

| | | |
|---|---|---|
| | **Ancient languages:** Latin, Greek<br>**National languages**<br><br>**Literature**<br>Cameroon Literature; French Literature;<br>Francophone Literature;<br>Other literatures | Develop general knowledge through ancient languages and cultures; know the origins of the French language for linguistic mastery;<br>Carry out elementary tasks in translation. |
| 2-Science and Technology | Mathematics,<br>The Sciences<br>Computer Science | Use mathematic knowledge skills and values with confidence to solve real life problems within the different domains of life;<br>Communicate concisely and unambiguously and develop power of mathematical reasoning (logical thinking, accuracy and spatial awareness). |
| | | **The Sciences:**<br>Acquire the fundamentals of sciences in order to understand the functioning of the human body, the living world, the earth and the environment;<br>Acquire methods and knowledge to understand and master the functioning of technical objects made by man to satisfy his needs;<br>Demonstrate attitudes to protect his/her health and environment. |
| | | **Computer Science :**<br>Master the basics of Information and Communication Technologies;<br>Exploit and use ICTs to learn. |
| **3- Social Sciences /Humanities** | **History**<br><br>**Geography**<br><br>**Citizenship Education** | Possess cultural references to better locate events in time and space within a democratic system and become a responsible citizen.<br>**History:**<br>Acquire a common culture ; be aware of heritage from the past and current challenges;<br>**Geography :**<br>Develop one's curiosity and knowledge of the world;<br>Get acquainted with landmarks to find your way and fit in the world.<br>**Citizenship Education:** |

| | | |
|---|---|---|
| | | Possess essential knowledge in rights and duties in order to fulfil his/her citizenship. |
| **4- Personal Development** | **Moral Education;**<br><br>**Home Economics;**<br><br>**Sports and Physical Education**<br><br>**Health Education** | Develop his / her physical abilities/skills ;<br>Get ready for physical challenges , save and regain energy after physical efforts;<br>Identify risk factors; possess basic knowledge and principles in hygiene and health education;<br>Demonstrate a sense of self control and appreciate the effect of physical activities.<br>Conceive and draw up sports and cultural animation projects;<br>Acquire methods and develop a high sense of efforts;<br>Conceive, draw up and implement projects that will enable one to project his/her image and feel the well being inspired by self-confidence. |
| **5- Arts and National Cultures** | **Arts/Artistic Education;**<br><br>**National Cultures** | **Artistic Education:**<br>Observe and appreciate works of art;<br>Carry out an artistic activity;<br>Gradually acquire the love for personal expression and creativity;<br>Possess a mastery of creativity in music, plastic arts and the performing arts.<br>Dramatise, recite texts (poems, tales, proverbs, etc.) relating to various areas of society;<br>Practise the different dramatic genres: sketches, comedy, tragedy, drama, etc.<br><br>**National languages and Cultures**<br>Demonstrate a mastery of Cameroon cultures;<br>Visit the various cultural areas of the country in order to discover their characteristics;<br>Demonstrate a mastery of basic rules in writing Cameroonian languages as well as basic grammatical notions applied to these languages;<br>Demonstrate a mastery of one of the national languages at 3 levels: morpho-syntax, reception and production of simple oral and written texts. |
| Even though the learners acquires skills in different disciplines, these competences are accompanied by other skills known as cross curricular competences related to intellectual, methodological, social and personal areas of learning. | | |
| **6- Cross curricular** | Intellectual and Methodological | Solve Problem in a given situation; |

| | | |
|---|---|---|
| **competences** | domains | Use knowledge skills and values with confidence in order to solve real life problems within the different domains of life;<br>With confidence, find useful information to solve problems he/she is faced with;<br>Give his/her opinion ;<br>Support his/her opinion with strong arguments ;<br>Assess him/herself with a view to remediation;<br>Demonstrate basic knowledge in note taking ;<br>Conceive and realise individual projects;<br>Analyse and summarise information, give feedback and report orally or in writing.<br>Develop problem solving approaches;<br>Exploit and use ICTs in his/her activities. |
| | **Social and Personal Domains** | Interact positively and assert his/her personality while respecting that of other people;<br>Join team work, fit in a common initiative project /group;<br>Demonstrate interest in cultural activities ;<br>Develop a sense of effort, love for work, perseverance in tasks or activities carried out ;<br>Understand and accept others in intercultural activities;<br>Accept group assessment. |

The resources to be mobilised by the learner are found in many disciplines and areas of learning. So it is important to implement these syllabuses not in isolation but as interrelated subjects. These remarks hold both for subject and cross curricular competences. They are so called to show that they should be developed through teaching/learning activities of the different subjects. The development of subject and cross curricular competences concern the entire education family as they are capable of inspiring an educative project and the putting in place of extracurricular activities. The ultimate training goal of these syllabuses, at the end of the first cycle, is to enable the learner to be self reliant, to be able to keep on learning throughout his/her life, to contribute to sustainable development and become a responsible citizen.

## Contents

## 1. GENERAL INTRODUCTION

The study of Geology is expected to be a development of the knowledge (scientific notions), know-how (improved methods and techniques) and development of attitudes about the earth as a planet. It offers to the learners the opportunity to construct and appropriate knowledge and skills necessary in explaining events and phenomena in his environment as well as to better manage the multiple and ever-changing daily life situations which he faces within the environment. This is a field science which requires laboratory as well as field excursions for the effective study of the earth.

## 2. COMPETENCIES THAT THE SYLLABUS WOULD DEVELOP IN THE LEARNER

**In the fields of societal and family life:** The syllabus seeks to inculcate in the learner psychosocial competencies (life skills) for meeting with the exigencies of individual and community life, health and responsible citizenship.

**In the economic domain:** It will enable the learner to acquire competencies in managing the transformation and preservation of simple consumer goods necessary for good health, wellbeing and comfort.

**In the field of environmental education:** It will enable the learner to reinvest the knowledge acquired in environmental conservation leading to the maintenance of the natural equilibrium and conservation which are life-wires of sustainable development.

## 3. PRESENTATION OF THE FAMILIES OF SITUATIONS COVERED BY THE SYLLABUS

| N°. | MODULE | FAMILY OF SITUATIONS | CLASS |
|---|---|---|---|
| I | Internal geodynamic processes | • Provision of man's resources in earth (surface and subsoil) resources<br>• Prevalence of natural risks and disasters | Form 4 |
| II | External geodynamic processes | • Denudation of the natural environment<br>• Depletion of petrologic resources | |
| III | Environmental/economic and applied Geology | • Management of geologic resources | |
| I | Internal geodynamic processes | • Prevalence of risks associated to geologic structures<br>• Prevalence of geohazards due to plate motions on the globe | Form 5 |
| II | External geodynamic processes | • Differences in evolution and geological environment<br>• Interpreting geological and topographical features | |
| III | Environmental/economic and applied Geology | • Prevalence of environmental hazards<br>• Wide distribution of mineral deposits<br>• Depletion of geological resources | |

## READING AND UNDERSTANDING THE SYLLABUS

The syllabus is presented in a matrix which appears as in the following table:

| CONTEXTUAL FRAMEWORK | | COMPETENCIES | | RESOURCES | | | |
|---|---|---|---|---|---|---|---|
| **Families of Situations** | **Examples of Situations** | **Categories of Actions** | **Examples of Actions** | **Content (Core Knowledge)** | **Aptitude (Skills)** | **Attitudes** | **Other Resources** |
| | | | | | | | |

## 5. EVALUATION OF THE OUTCOME OF THE GEOLOGY SYLLABUS

The overall goal of this syllabus is to evaluate the ability of the learner to construct, appropriate and reinvest scientific knowledge and methods to seek solutions to real life situations in different contexts.

Evaluation will be conducted at two levels:

1.1. evaluation of the scientific methods acquired and knowledge constructed and appropriated; and
1.2. evaluation of the competencies developed by the learner.

These would include among others the ability to:

- recall simple scientific facts, principles and concepts;
- explain scientific facts, concepts and principles in one's own words;
- use and care for equipment;
- design and use experiments to verify or demonstrate scientific concepts;
- be autonomous and assertive;
- be creative and innovative;
- apply scientific knowledge and methods in problem-solving;
- organise material and present ideas in a clear and logical manner;
- handle patterns in scientific knowledge and show prove of the appropriation of critical, imaginative and inferential thinking skills;
- initiate action in seeking solutions to daily life problems;
- communicate efficiently and interact effectively with other members of the community.

In any case, emphasis should be placed where necessary on the appropriation of psychosocial competencies inherent in each module.

## TIME ALLOCATION AND OVERVIEW OF THE MODULES

This syllabus will be taught in 75 hours giving a total of 90 periods of 50 minutes each at the rate of 03 lessons (periods) per week. Considering holidays, certificate examination time and other interruptions within the academic year, the teacher is advised to programme his/her teaching over 26 weeks with 60% of the work in the first term, 30% in the second term and 10% in the third term. It should be noted that emphasis is on the development of competencies that should culminate in the learner establishing the link between school knowledge and the community.

The three modules that make up the Geology syllabus and the relative duration to spend on each of them are as presented in the table below:

### 6. RELATIVE DURATION/PERIOD OF TEACHING OF EACH MODULE

| CLASS | MODULE 1 | MODULE 2 | MODULE 3 |
|---|---|---|---|
| Form 4 | 48 | 23 | 19 |
| Form 5 | 23 | 32 | 35 |

# FORM FOUR (4) SYLLABUS

# SYLLABUS OUTLINE FORM 4

## BRIEF PRESENTATION OF THE MODULES

## MODULE ONE: *INTERNAL GEODYNAMIC PROCESSES*

**TIME ALLOCATION:**

**INTRODUCTION TO THE MODULE**

This module treats:

- Introduction to Geology;
- Nature of the solar system;
- Earthquakes and
- Vulcanicity

The teacher should facilitate the deepening of the construction and appropriation of knowledge and competencies by the learner linked to:

- knowledge of specific scientific facts, terminologies, concepts, conventions, trends and sequences;
- the reinvestment of such knowledge in seeking solutions or explanations to life situations or events and phenomena in the learner's environment;
- the explanation of such mechanisms through the identification of problems and seeking ways of solving them; and
- the application of such knowledge to improve on human life in the field of Geology, other sciences, technology and the society.

## SYNOPSIS OF CATEGORIES OF ACTION, CORE KNOWLEDGE AND ESTIMATED DURATION IN PERIODS MODULE 1

| Category of actions | Core Knowledge | Estimated Duration in Periods |
|---|---|---|
| Appropriating the basic concepts of Geology | 1.1. Definition of Geology | 09 |
| | 1.2. Relationship between | |
| | 1.3. Geology and other subjects | |
| | 1.4. Branches of Geology | |
| | 2.1. Nature of the solar system | 12 |
| | 2.2. Relative position and size of the sun and its planets | |
| | 2.3. Geology of the moon as the earth's satellite | |
| | 2.4. Earth's shell and their physical states such as stratosphere, troposphere, lithosphere, asthenosphere, mantle and core | |
| Reduction of seismic risks, disasters and catastrophes | 3.0. Earthquakes. | 12 |
| | 3.1. Origin and definitions. | |
| | 3.2. Manifestations, types and types of waves. | |
| | 3.3. Methods of evaluating earthquake intensities and magnitude. | |
| | 3.3.1. Mercalli scale. | |
| | 3.3.2. Richters scale. | |
| | 3.4. Localisation of earthquakes on a global scale. | |
| | 3.5. Prediction of earthquakes. | |
| | 3.6. Monitoring of earth quakes. | |
| | 4. Vulcanicity. | 15 |
| | 4.1. Definitions of vulcanicity and magma | |
| | 4.2. Origin and types of magmas. | |
| | 4.3. Properties of magma. | |
| | 4.4. Types of volcanic eruptions. | |
| | 4.5. Products of volcanic eruptions. | |
| | 4.6. Extrusive and intrusive landforms. | |
| | 4.7. The Cameroon volcanic line. | |
| **TOTAL** | | **48 PERIODS** |

| CONTEXTUAL FRAMEWORK | | COMPETENCIES | | RESOURCES | | | |
|---|---|---|---|---|---|---|---|
| **Family of situations** | **Examples of situations** | **Category of actions** | **Example of actions** | **Essential Knowledge** | **Abilities (Aptitudes)** | **Life Skills (Practice)** | **Other resources** |
| Provision of man's needs in earth (surface and subsoil) resources | Existence of different scientific notions and concepts relating to the soil and the subsoil | Appropriating the basic concepts of Geology | • defining Geology and linking it with other scientific disciplines like Maths, Physics, Chemistry and Biology.<br>• distinguishing the various domains in Geology and their field applications<br>• being able to use the knowledge of the subject to help the society | 1.1. Definition of Geology<br>1.2. Relationship between Geology and other subjects<br>1.3. Branches of Geology<br>1.4. Importance of Geology to man | • Identify and use the knowledge acquired in relation with other scientific domains in real life situations. | • Raise awareness on the importance of the subject to the society | • Chemists<br>• Physicists<br>• Biologists<br>• Geographers |

| CONTEXTUAL FRAMEWORK | | COMPETENCIES | | RESOURCES | | | |
|---|---|---|---|---|---|---|---|
| **Family of situations** | **Examples of situations** | **Category of actions** | **Example of actions** | **Essential Knowledge** | **Abilities (Aptitudes)** | **Life Skills (Practice)** | **Other resources** |
| Provision of man's needs in earth (surface and subsoil) resources | Existence of different scientific notions and concepts relating to the soil and the subsoil | Appropriating the basic concepts of Geology | • Explaining the origin of the solar system and the relative positions of the various planets.<br>• Identifying the various lunar topographical features.<br>• Identifying the various earths shells and their Physical states and properties. | **2.1**. Nature of the solar system.<br>**2.2**. An account of the relative positions and size of the sun and its planets.<br>**2.3**. Geology of the moon as the Earth's satellite.<br>**2.4.** Earths shells and their physical states such as stratosphere, troposphere, lithosphere, asthenosphere, mantle and the core. | • Describe the origin of the solar system knowing the various positions of the planets and their sizes in relation to the sun.<br>• Describe the topographical features of the moon.<br>• Stratify the Earth into the various shells stating their properties and physical states. | knowing the position of the planet to which man belongs within the solar system. Differentiate the Earths' shells. | • Astronomers<br>• geographers<br>• climatologist |

| CONTEXTUAL FRAMEWORK | | COMPETENCIES | | RESOURCES | | | |
|---|---|---|---|---|---|---|---|
| **Family of situations** | **Examples of situations** | **Category of actions** | **Example of actions** | **Essential Knowledge** | **Abilities (Aptitudes)** | **Life Skills (Practice)** | **Other resources** |
| Prevalence of natural risks and disasters | Seismic risks and disasters | Reduction of seismic risks, disasters and catastrophes | • Awareness raising and/or educating the population.<br>• participating in disaster monitoring and management<br>• Early warnings and whistle blowing. | **3.0.** Earthquakes.<br>**3.1.** Origin and definitions.<br>**3.2**. Manifestations, types and types of waves.<br>**3.3.** Methods of evaluating earthquake intensities and magnitude.<br>**3.3.1.** Mercalli scale.<br>**3.3.2**. Richters scale.<br>**3.4.** Localisation of earthquakes on a global scale.<br>**3.5.** Prediction of earthquakes.<br>**3.6.** Monitoring of earth quakes.<br>**3.7.** Management of earthquakes. | • Recognising different phenomena that characterize earthquakes.<br>• Collection and organisation of information to prevent possible risks and disasters from earthquakes.<br>• Reconstitution of the seismic hist of an area.<br>• Identification of precursory signs of quakes.<br>• choice of construction sites.<br>• Participation in simulation exercises for earth quakes<br>• Application of safety rules in the event of an earth quake. | • Developing a whistle blowing attitude.<br>• Development of safety reflexes | Geologists<br>Seismologists<br>population of risky zones<br>Ministry of mines and energy. |

| CONTEXTUAL FRAMEWORK | | COMPETENCIES | | RESOURCES | | | |
|---|---|---|---|---|---|---|---|
| **Family of situations** | **Examples of situations** | **Category of actions** | **Example of actions** | **Essential Knowledge** | **Abilities (Aptitudes)** | **Life Skills (Practice)** | **Other resources** |
| Prevalence of natural risks and disasters | Volcanic risks and disasters | Reducing volcanic risks and disasters | • Awareness raising and educating the population on the dangers of volcanic eruptions<br>• Understanding the origin properties and types of magma.<br>• Recognising the various types of volcanic eruption and their products.<br>• Raising awareness on the importance of the Cameroon volcanic line and the dangers it poses to the population.<br>• Awareness about vulcanicity along the Cameroon volcanic line (CVL). | 4. Vulcanicity.<br>4.1. Definitions of vulcanicity and magma<br>4.2. Origin and types of magmas.<br>4.3. Properties of magma.<br>4.4. Types of volcanic eruptions.<br>4.5. Products of volcanic eruptions.<br>4.6. Extrusive and intrusive landforms.<br>4.7. The Cameroon volcanic line. | • Recognising the different processes that characterised volcanic eruptions.<br>• Collection and organisation of information to prevent possible risk and disaster.<br>• Identifying the types of volcanic products and applying their characters to help develop the society. | • Using volcanic products as manure<br>• Avoiding habitation and construction on steep slopes and on fragile volcanic products (mostly along the CVL) | • Volcanologist,<br>• Seismologist |

## MODULE TWO: *EXTERNAL GEODYNAMIC PROCESSES*

**TIME ALLOCATION:**

**INTRODUCTION TO THE MODULE**

This module treats:

- Surface processes and
- Sedimentary petrology

The teacher should facilitate the deepening of the construction and appropriation of knowledge and competencies by the learner linked to:

- knowledge of specific scientific facts, terminologies, concepts, conventions, trends and sequences;
- the reinvestment of such knowledge in seeking solutions or explanations to life situations or events and phenomena in the learner's environment;
- the explanation of such mechanisms through the identification of problems and seeking ways of solving them; and
- the application of such knowledge to improve on human life in the field of Geology, other sciences, technology and the society.

## SYNOPSIS OF CATEGORIES OF ACTION, CORE KNOWLEDGE AND ESTIMATED DURATION IN PERIODS MODULE 11

| Category of actions | Core Knowledge | Estimated Duration in Periods |
|---|---|---|
| Reduction of risks from the disruption of natural equilibria | 1. Surface processes | 18 |
| | 1.1. Definition of surface processes: weathering, erosion, transportation and deposition | |
| | 1.2. Types of weathering | |
| | 1.3. Factors affecting the rate of weathering (wind, waves, water, ice) | |
| | 1.4. Features produced by wind, water, and waves erosion deposition | |
| | 1.5. Mass wasting (definition) | |
| | 1.6. Types, classification and methods of prevention of mass wasting | |
| Utilization of sedimentary rocks | 2. Sedimentary petrology | 05 |
| | 2.1. Origin and definition of sedimentary rocks | |
| | 2.2. Stages and conditions of formation (alterations, transport, sedimentation) | |
| | 2.3. Lithification and diagenesis | |
| | 2.4. Simple sedimentary structures and textures | |
| | 2.5. Brief classification sedimentary rocks | |
| | 2.6. Petrologic description of sedimentary rocks | |
| | 2.7. Relationship between the properties of sedimentary rocks and their uses (clay, gypsum, sand, marble, schists, etc | |
| **TOTAL** | | **23 PERIODS** |

| CONTEXTUAL FRAMEWORK | | COMPETENCIES | | RESOURCES | | | |
|---|---|---|---|---|---|---|---|
| **Family of situations** | **Examples of situations** | **Category of actions** | **Example of actions** | **Essential Knowledge** | **Abilities (Aptitudes)** | **Life Skills (Practice)** | **Other resources** |
| Denudation of the natural environment | Risks from the disruption of natural equilibria | Reduction of risks from the disruption of natural equilibria | • Define and state the various types of weathering<br>• Identify the effects of weathering on specific rock types and minerals.<br>• list the various products of weathering and their importance to the society.<br>• Awareness of the dangers posed by mass wasting and areas that are prone to specific types of mass wasting. | 1. Surface processes.<br>1.1. Definition of surface processes. weathering, erosion, transportation and deposition<br>1.2. Types of weathering.<br>1.3. Factors affecting the rate of weathering.<br>1.4. Factors that influences erosion (wind, waves, water and ice). Features produced by wind, water and wave erosion and deposition.<br>1.5. Mass wasting (definition)<br>1.6. Types, classification and methods of prevention of mass wasting. | • Identify the various types of weathering in the field<br>• Describe the effect of weathering on specific rocks and minerals with their products.<br>• Identify the various products of weathering and their importance to man and the environment.<br>• Recognising the dangers tha accompanying mass wasting.<br>• Organisation and application of methods to check mass wasting. | Recognition of the various modes of weathering .and their products. production of Construction mat and ceramics fron weathered products. Development of safety reflexes. | • petrologists<br>• volcanologists<br>• pedologists<br>• civil engineers |

| CONTEXTUAL FRAMEWORK | | COMPETENCIES | | RESOURCES | | | |
|---|---|---|---|---|---|---|---|
| Families of situations | Examples of situations | Categories of action | Examples of actions | Content (Core Knowledge) | Aptitude (Skills) | Attitudes | Other Resources |
| Depletion of petrologic resources | Management of petrologic resources | Utilization of sedimentary rocks | – read and transcribe information contained in sedimentary rock (structure, texture, etc)<br>- use of rocks in building (e;g; sand) | 2. Sedimentary petrology<br>2.1. Origin and definition of sedimentary rocks<br>2.2. Stages and conditions of formation (alterations, transport, sedimentation)<br>2.3. Lithification and diagenesis<br>2.4. Simple sedimentary structures and textures<br>2.5. Brief classification sedimentary rocks<br>2.6. Petrologic description of sedimentary rocks<br>2.7. Relationship between the properties of sedimentary rocks and their uses (clay, gypsum, sand, marble, schists, etc<br>2.8. Quarrying of sand for building | - Identify and describe common rocks and textures<br>- Sort sedimentary rocks in terms of particle size<br>- Utilization of sedimentary rocks | Curiosity<br>Observation<br>Critical thinking | -Ministry of mines and industry<br>-environmentalists<br>-petrologists<br>-Civil engineers<br>- Geologists<br>- Biologists |

## MODULE THREE: *ENVIRONMENTAL/ECONOMIC AND APPLIED GEOLOGY*

**TIME ALLOCATION:**

**INTRODUCTION TO THE MODULE**

This module treats:

- Applied Geology;
- Energy resources;
- Soil
- Hydrology and mineral resources

The teacher should facilitate the deepening of the construction and appropriation of knowledge and competencies by the learner linked to:

- knowledge of specific scientific facts, terminologies, concepts, conventions, trends and sequences;
- the reinvestment of such knowledge in seeking solutions or explanations to life situations or events and phenomena in the learner's environment;
- the explanation of such mechanisms through the identification of problems and seeking ways of solving them; and
- the application of such knowledge to improve on human life in the field of Geology, other sciences, technology and the society.

## SYNOPSIS OF CATEGORIES OF ACTIONS, CORE KNOWLEDGE AD ESTIMATED DURATION IN PERIODS MODULE 111

| Category of actions | Core Knowledge | Estimated Duration in Periods |
|---|---|---|
| Prevention of soil degradation | 1. The soil | 05 |
| | 1.1. Structure of a soil profile | |
| | 1.2. Constituents of a soil | |
| | 1.3. Role of the soil | |
| | 1.4. Sustainable management of the soil | |
| | 1.5. Factors that favour soil degradation | |
| | 1.6. Protection of the soil | |
| Prevent energy and mineral resources depletion | 2. Economic and applied Geology (definition and mineral deposits) | 09 |
| | 2.1. Uses of local Geologic materials | |
| | 2.2. Energy sources, their origin, formation and occurrence | |
| | 2.3. The hydrologic cycle | |
| | 2.4. Underground water circulation and accumulation | |
| | 2.5. The water table, springs and wells | |
| | 2.6. Porosity, permeability and aquifers | |
| Utilization of igneous rocks | 3. Igneous petrology | 05 |
| | 3.1. Definition of igneous petrology and igneous rocks | |
| | 3.2. Brief classification of igneous rocks | |
| | 3.3. Petrologic description of common igneous rocks | |
| | 3.4. Quarrying for construction | |
| **TOTAL** | | **19 PERIODS** |

| **CONTEXTUAL FRAMEWORK** | | **COMPETENCIES** | | **RESOURCES** | | | |
|---|---|---|---|---|---|---|---|
| Families of situations | Examples of situations | Categories of action | Examples of actions | Content (Core Knowledge) | Aptitude (Skills) | Attitudes | Other Resources |
| Management of Geological resources | Soil degradation | Prevention of soil degradation | - Educate and sensitise on role of the soil<br>- Practice soil conservation Techniques | 1. The soil<br>1.1. Structure of a soil profile<br>1.2. Constituents of a soil<br>1.3. Role of the soil<br>1.4. Sustainable management of the soil<br>1.5. Factors that favour soil degradation<br>1.6. Protection of the soil | - Practice terrace farming<br>- Prevent soil erosion<br>- Practice fallowing | Curiosity<br>Observation<br>Critical thinking<br>Environmental friendliness | -Ministry of mines and industry<br>-environmentalists<br>-petrologists<br>-Civil engineers<br>- Geologists<br>- Biologists |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Management of Geological resources | Depletion of energy and mineral sources | Prevent energy and mineral resources depletion | - Educate and sensitise<br>- Practice energy and mineral conservation | 2. Economic and applied Geology (definition and mineral deposits)<br>2.1. Uses of local Geologic materials<br>2.2. Energy sources, their origin, formation and occurrence<br>2.3. The hydrologic cycle<br>2.4. Underground water circulation and accumulation<br>2.5. The water table, springs and wells<br>2.6. Porosity, permeability and aquifers | - Adopt preventive and conservation measures in the exploitation and use of geologic resources | Eco-friendliness | Ministry of mines and industry<br>-environmentalists<br>-petrologists<br>-Civil engineers<br>- Geologists<br>- Biologists |
| | Depletion of petrologic resources | Utilization of igneous rocks | - read and transcribe information contained in sedimentary rocks (structure, texture, etc)<br>- use of rocks in building | 3. Igneous petrology<br>3.1. Definition of igneous petrology and igneous rocks<br>3.2. Brief classification of igneous rocks<br>3.3. Petrologic description of common igneous rocks<br>3.4. Quarrying | - Identify and describe common rocks and textures<br>- Sort sedimentary rocks in terms of particle size<br>- Utilization of sedimentary rocks | Curiosity<br>Observation<br>Critical thinking | -Ministry of mines and industry<br>-environmentalists<br>-petrologists<br>-Civil engineers<br>- Geologists<br>- Biologists |

# FORM FIVE (5) SYLLABUS

# SYLLABUS OUTLINE FORM 5

## BRIEF PRESENTATION OF THE MODULES

## MODULE ONE: *INTERNAL GEODYNAMIC PROCESSES*

**TIME ALLOCATION:**

**INTRODUCTION TO THE MODULE**

This module treats:

- Structural Geology, stress and strain forces;
- Folds, faults and joints;
- Plates and plate tectonics and
- Continental drift;

The teacher should facilitate the deepening of the construction and appropriation of knowledge and competencies by the learner linked to:

- knowledge of specific scientific facts, terminologies, concepts, conventions, trends and sequences;
- the reinvestment of such knowledge in seeking solutions or explanations to life situations or events and phenomena in the learner's environment;
- the explanation of such mechanisms through the identification of problems and seeking ways of solving them; and
- the application of such knowledge to improve on human life in the field of Geology, other sciences, technology and the society.

## SYNOPSIS OF CATEGORIES OF ACTIONS, CORE KNOWLEDGE AND ESTIMATED DURATIONS IN PERIODS MODULE 1

| Category of actions | Core Knowledge | Estimated Duration in Periods |
|---|---|---|
| Preventing risks associated to geological structures | 1. Structural Geology | 12 |
| | 1.1. Definition and description of stress and strain | |
| | 1.2. Rock response to stress, strain (brittle and ductile responses). | |
| | 1.3. Definition and description of folds based on the attitude of the axial plane (symmetrical and asymmetrical etc.). | |
| | 1.4. Definition and description of faults (normal, reverse, and tear faults). | |
| | 1.5. Definition and description of common joints such as cooling joints, tectonic joints and desiccation joints. | |
| Preventing geohazards due to plate motions | 2. Definition of Plates and Plate Tectonics. | 11 |
| | 2.1. An outline of the Earths major and minor Plates | |
| | 2.2. An outline of the various types of plate boundaries and their characteristic features and processes. | |
| | 2.3. The theory of Seafloor Spreading | |
| | 2.4. Some major evidences to prove the theory of Sea floor Spreading | |
| | 2.5. The concept of Continental Drift | |
| | 2.6. Evidences to support the concept | |
| | 2.7. Continental Drift and it relationship to the shapes of continents today. | |
| **TOTAL** | | **23 PERIODS** |

| CONTEXTUAL FRAMEWORK | | COMPETENCIES | | RESOURCES | | | |
|---|---|---|---|---|---|---|---|
| **Family of situations** | **Examples of situations** | **Category of actions** | **Example of actions** | **Essential Knowledge** | **Abilities (Aptitudes)** | **Life Skills (Practice)** | **Other resources** |
| Prevalence of risks associated to geological structures | Management of risks associated to geological structures | Preventing risks associated to geological structures | • Identification of folds, faults and joints in the environment.<br>• Educating on the risk factors in constructing along faults planes. | 1. Structural Geology<br>1.2. Definition and description of stress and strain<br>1.3. Rock response to stress, strain (brittle and ductile responses).<br>1.4. Definition and description of folds based on the attitude of the axial plane (symmetrical and asymmetrical etc.).<br>2.4. Definition and description of faults (normal, reverse, and tear faults).<br>2.5. Definition and description of common joints such as cooling joints, tectonic joints and desiccation joints. | • Recognition of the geologic and economic importance of folds, faults and joints. | • Using geologic structures to map out possible disaster risk zones.<br>• Linking structures to possible mineralized areas and springs. | • Structural geologist.<br>• Engineering geologist. |

| CONTEXTUAL FRAMEWORK | | COMPETENCIES | | RESOURCES | | | |
|---|---|---|---|---|---|---|---|
| **Family of situations** | **Examples of situations** | **Category of actions** | **Example of actions** | **Essential Knowledge** | **Abilities (Aptitudes)** | **Life Skills (Practice)** | **Other resources** |
| Prevalence of geohazards due to plate motion on the globe. | Management of geohazards of plate motion origin | Preventing geohazards due to plate motions | • Identifying the forces that drive plate motions.<br>• Identify processes and features associated to various plate boundaries.<br>• Describe the effects of Continental Drift to the present day distribution of natural resources. | 2. Definition of Plates and Plate Tectonics.<br>2.1. An outline of the Earths major and minor Plates<br>2.2. An outline of the various types of plate boundaries and their characteristic features and processes.<br>2.3. The theory of Seafloor Spreading<br>2.4. Some major evidences to prove the theory of Sea floor Spreading<br>2.5. The concept of Continental Drift<br>2.6. Evidences to support the concept Continental Drift and it relationship to the shapes of continents today. | - Resolving the notion of plate motion and relating it to the asthenosphere.<br>- Identify the various types of quakes and volcanism that are associated to the various plate boundaries.<br>- Relate the concept of continental drift to Sea Floor Spreading, plate motions and plate boundaries. | • Relationship between plate boundaries and disaster risk zones on a global scale. | • Seismologist<br>• Volcanologist<br>• Environmental geologist. |

## MODULE TWO: *EXTERNAL GEODYNAMIC PROCESSES*

**TIME ALLOCATION:**

**INTRODUCTION TO THE MODULE**

This module treats:

- Palaeontology;
- Stratigraphy;
- Geological maps and
- Field excursion.

The teacher should facilitate the deepening of the construction and appropriation of knowledge and competencies by the learner linked to:

- knowledge of specific scientific facts, terminologies, concepts, conventions, trends and sequences;
- the reinvestment of such knowledge in seeking solutions or explanations to life situations or events and phenomena in the learner's environment;
- the explanation of such mechanisms through the identification of problems and seeking ways of solving them; and

the application of such knowledge to improve on human life in the field of Geology, other sciences, technology and the society.

## SYNOPSIS OF CATEGORIES OF ACTIONS, CORE KNOWLEDGE AND ESTIMATED DURATION IN PERIODS MODULE 11

| Category of actions | Core Knowledge | Estimated Duration in Periods |
|---|---|---|
| Identifying evolutionary and environmental changes from fossils. | 1. Definition of Palaeontology and fossils | 10 |
| | 1.1. Types of fossils | |
| | 1.2. Conditions necessary for fossil preservation. | |
| | 1.3. Fossils as geological indicators | |
| | 1.4. Uses of fossils | |
| Absolute and relative dating methods | 2. Definition of Stratigraphy | 10 |
| | 2.1. The stratigraphic time scale | |
| | 2.2. Stratigraphic principles | |
| | 2.3. Definition and types of unconformities. | |
| | 2.4. Transgression and regression | |
| | 2.5. Simple methods of relative dating. | |
| Construction of topographic profile and cross-sections. | 3. Geological maps | 09 |
| | 3.1. Basic signs and symbols on map. | |
| | 3.2. Interpretation and construction of topographic profiles and cross sections | |
| | 3.3. Interpretation of simple structures from simple $A_4$ maps. | |
| | 3.4. Uses of Geologic maps | |
| Facilitate field research towards identification and quantifying natural resources | 4. Practical work | 03 |
| | 5. Field excursion | |
| **TOTAL** | | **32 PERIODS** |

| CONTEXTUAL FRAMEWORK | | COMPETENCIES | | RESOURCES | | | |
|---|---|---|---|---|---|---|---|
| **Family of situations** | **Examples of situations** | **Category of actions** | **Example of actions** | **Essential Knowledge** | **Abilities (Aptitudes)** | **Life Skills (Practice)** | **Other resources** |
| Differences in evolution and geological environment | Fossils as evolutionary and environmental indicators | Identifying evolutionary and environmental changes from fossils. | • Locating fossil species to their respective environments.<br>• Identification of different types of fossils.<br>• Classifying fossils.<br>• Using fossils to decipher evolutionary change.<br>• Using fossils to determine the order of rock formation. | 6. Definition of Palaeontology and fossils<br>6.1. Types of fossils<br>6.2. Conditions necessary for fossil preservation.<br>6.3. Fossils as geological indicators<br>6.4. Uses of fossils | • Drawing, labelling and describing different classes of fossil organisms.<br>• Recognising modes of preservation of fossils.<br>• Environments of fossilization, importance to man and the society. | -Identification and description of different species of fossils<br>-Recognising the importance of fossils.<br>-Fossils and oil accumulation | Palaeontologist |

| CONTEXTUAL FRAMEWO | | COMPETENCIES | | RESOURCES | | | |
|---|---|---|---|---|---|---|---|
| **Family of situations** | **Examples of situations** | **Category of actions** | **Example of actions** | **Essential Knowledge** | **Abilities (Aptitudes)** | **Life Skills (Practice)** | **Other resources** |
| The earth's history. | Method of studying earth history. | Absolute and relative dating methods | • Application of stratgraphic principles in establishing earth history<br>• Use of unconformities to decipher internal geodynamic forces and missing links in earth's history<br>• Field identification of marine transgression and regression | 7. Definition of Stratigraphy<br>7.1. The stratigraphic time scale<br>7.2. Stratigraphic principles<br>7.3. Definition and types of unconformities.<br>7.4. Transgression and regression<br>7.5. Simple methods of relative dating. | -Understanding and recognising unconformities, facies due to sea level charger<br>-Causes of sea level Changes<br><br>-Application of stratigraphic principles to the natural environment. | -recognition of earth history.<br>Ability to date geologic event, episodes and materials | Stratigraphers.<br>Historical geologist. |

| CONTEXTUAL FRAMEWORK | | COMPETENCIES | | RESOURCES | | | |
|---|---|---|---|---|---|---|---|
| **Family of situations** | **Examples of situations** | **Category of actions** | **Example of actions** | **Essential Knowledge** | **Abilities (Aptitudes)** | **Life Skills (Practice)** | **Other resources** |
| Interpreting geological and topographical features on maps | Simple structures, topographic profile and cross-section | Construction of topographic profile and cross-sections. | • Identify and relate features on map to block diagrams and natural environment.<br>• Recognise how scales of maps are developed and used.<br>• Construct a topographic profiles and cross-sections.<br>• Locate places, geological features and mineral deposits on maps | 8. Geological maps<br>8.1. Basic signs and symbols on map.<br>8.2. Interpretation and construction of topographic profiles and cross sections<br>8.3. Interpretation of simple structures from simple $A_4$ maps.<br>8.4. Uses of Geologic maps | - Recognizing common signs and symbols on maps.<br>- Identify the various geological features on maps.<br>-Construction of topographic profiles and cross-section<br>-Identify common features in the field<br>- Importance of various features to geologist and civil engineers. | -Use of drawing set constructs a profile and a section.<br>-Reduction of portions of maps using scales.<br>-using map to determine the nature of the internal earth. | • Cartographer<br>• Geographer<br>• Geologist<br>• Civil engineer<br>• Ministry of public work |

| CONTEXTUAL FRAME WORK | | COMPETENCIES | | RESOURCES | | | |
|---|---|---|---|---|---|---|---|
| **Family of situation** | **Example of situation** | **Category of actions** | **Example of Actions** | **Essential knowledge** | **Abilities aptitudes** | **Life skills practice** | **Other resources** |
| Interpreting geological and topographical features | Identification of specimens in the laboratory and at its environment of formation | Facilitate field research towards identification and quantifying natural resources | • Observation and description of rocks, minerals and fossils collected from the field.<br>• Analysis of sediments<br>• Obtaining density of minerals.<br>• Identification of some geological features on maps | 9. Practical work<br>10. Field excursion | -Identify and briefly describe local minerals, rocks and fossils.<br>-Sort sediments in terms of particle size.<br>-Measure density of minerals<br>-Identify common geological features on maps and relate to the natural environment. | Development of skills to extract rocks and minerals in the field.<br>Identification of rocks, minerals and fossils in the field.<br>Use of maps to identify geological features. | • Geologic maps<br>• Rocks and mineral samples<br>• Crystal models<br>• Important geologic sites. |

## MODULE THREE: *ENVIRONMENTAL/ECONOMIC AND APPLIED GEOLOGY*

**TIME ALLOCATION:**

**INTRODUCTION TO THE MODULE**

This module treats:

- Environmental geology
- Crystallography
- Metamorphic petrology

The teacher should facilitate the deepening of the construction and appropriation of knowledge and competencies by the learner linked to:

- knowledge of specific scientific facts, terminologies, concepts, conventions, trends and sequences;
- the reinvestment of such knowledge in seeking solutions or explanations to life situations or events and phenomena in the learner's environment;
- the explanation of such mechanisms through the identification of problems and seeking ways of solving them; and
- the application of such knowledge to improve on human life in the field of Geology, other sciences, technology and the society.

## SYNOPSIS OF CATEGORIES OF ACTIONS, CORE KNOWLEDGE AND ESTIMATED DURATION IN PERIODS MODULE 111

| Category of actions | Core Knowledge | Estimated Duration in Periods |
|---|---|---|
| Occurence of natural geologic and human induced hazards | 1. Environmental Geology | 09 |
| | 1.1. Definition of Environmental Geology | |
| | 1.2. Common natural geologic hazards (eruptions, earthquakes, landslides, floods, mudflows etc) | |
| | 1.3. Geologic mining methods and the environment | |
| | 1.4. Simple methods of controlling Geohazards | |
| | 1.5. Global warming and its effects on climate | |
| Identification of minerals of economic importance | 2. Crystallography | 21 |
| | 2.1. Definitions of crystalline, crystal and a unit cell | |
| | 2.2. Description of chemical bonds (ionic, covalent, metallic and residual forces) | |
| | 2.3. Crystal morphology; faces, edges, nodes, solid angles and common simple forms such as cubes, prisms, pinacoids, octahedrons etc | |
| | 2.4. Classification of crystals into systems and classes based on the crystallographic axes and axial angles. | |
| | 2.5. Definition of crystal symmetry and its elements | |
| | 2.6. Definition Mineralogy, some physical properties of minerals. | |
| | 2.7. Description of some common minerals (quartz, feldspars, micas, olivines, talc, pyrite, chalcopyrite, galena, hematite, halite etc. | |
| | 2.8. Definition of silicate minerals and their classification based on their structures. | |
| Utilisation of metamorphic rocks | 3. Metamorphic petrology | 06 |
| | 3.1. Definition of metamorphic rocks | |
| | 3.2. Factors influencing metamorphism | |
| | 3.3. Simple description of types of metamorphic rocks | |
| | 3.4. Metamorphic textures and structures | |
| | 3.5. Petrologic description of common metamorphic rocks | |
| | 3.6. Quarrying | |
| **TOTAL** | | **35 PERIODS** |

| CONTEXTUAL FRAMEW | | COMPETENCIES | | RESOURCES | | | |
|---|---|---|---|---|---|---|---|
| **Family of situations** | **Examples of situatio** | **Category of actions** | **Example of Actions** | **Essential Knowledge** | **Abilities (Aptitudes)** | **Life Skills (Practice)** | **Other resources** |
| Prevalence of environmental hazards | Natural hazards | Reduction of natural geologic and human induced hazards | • Creating awareness by educating.<br>• Mapping of human induced and natural geologic hazards in communities.<br>• Identification of natural geologic and human-induced hazards<br>• Disaster prediction and early warning whistle-blowing. | 3. Environmental Geology<br>3.1. Definition of Environmental Geology<br>3.2. Common natural geologic hazards (eruptions, earthquakes, landslides, floods, mudflows etc)<br>3.3. Geologic mining methods and the environment<br>3.4. Simple methods of controlling Geohazards<br>3.5. Global warming and its effects on climate variability and change. | • -Collection of information on the history of the disasters.<br>• Precursory signs of the hazards.<br>• Prevention methods<br>• -Reduction of effects of the hazards.<br>• -Safety rules in the event of specific hazards. | • Development of community alert methods<br>• Evacuation directions and methods | • Ministry of Mines and Industry<br>• Environmentalist |

| CONTEXTUAL FRAMEWORK | | COMPETENCIES | | RESOURCES | | | |
|---|---|---|---|---|---|---|---|
| **Family of situations** | **Examples of situations** | **Category of actions** | **Example of Actions** | **Essential Knowledge** | **Abilities (Aptitudes)** | **Life Skills (Practice)** | **Other Resources** |
| Wide distribution of mineral deposits. | Mineral characterisation. | Identification of minerals of economic importance | • Being able to produce cardboard/wood<br>• Identify and explain the various common forms of crystals.<br>• Relating the various crystals forms to those that are found around the environment.<br>• Being able to see and recognize a mineral in the natural environment from its form. | 4. Crystallography<br>4.1. Definitions of crystalline, crystal and a unit cell<br>4.2. Description of chemical bonds (ionic, covalent, metallic and residual forces)<br>4.3. Crystal morphology; faces, edges, nodes, solid angles and common simple forms such as cubes, prisms, pinacoids, octahedrons etc<br>4.4. Classification of crystals into systems and classes based on the crystallographic axes and axial angles.<br>4.5. Definition of crystal symmetry and its elements<br>4.6. Definition Mineralogy, some physical properties of minerals.<br>4.7. Description of some common minerals (quartz, feldspars, micas, olivines, talc, pyrite, chalcopyrite, galena, hematite, halite etc.<br>4.8. Definition of silicate minerals and their classification based on their structures. | - Recognizing the various common crystal forms on wooden models.<br>- Using the common mineral forms to identify natural minerals in the geologic environment.<br>- Identifying the uses of the common minerals and their importance to the society.<br>-Being able to identify common minerals with the aid of their physical properties.<br>- Identify the common mineral resources and their locations in the country. | • Identifying mineral from their crystal forms.<br>• Educating the population on the importance and uses of minerals around their environment. | • Crystallographer<br>• mineralogist<br>• mining industries or companies |

| CONTEXTUAL FRAMEWORK | | COMPETENCIES | | RESOURCES | | | |
|---|---|---|---|---|---|---|---|
| Families of situations | Examples of situations | Categories of action | Examples of actions | Content (Core Knowledge) | Aptitude (Skills) | Attitudes | Other Resources |
| Depletion of geological resources | Management of mineral resources | Utilisation of metamorphic rocks | – Educate and sensitise<br>– Practicing sustainable exploitation of rocks and mineral resources<br>- Use of rocks in building | 4. Metamorphic petrology<br>4.1. Definition of metamorphic rocks<br>4.2. Factors influencing metamorphism<br>4.3. Simple description of types of metamorphic rocks<br>4.4. Metamorphic textures and structures<br>4.5. Petrologic description of common metamorphic rocks<br>4.6. Quarrying | Adopt preventive and conservation measures in the exploitation and use of geologic resources | Eco-friendliness | Ministry of mines and industry<br>-environmentalists<br>-Petrologists<br>-Civil engineers<br>- Geologists<br>- Biologists |

**Article 2**: The syllabus presented in article one here above shall be implemented as from the beginning of the 2016-2017 school year;

**Article 3**: All previous provisions repugnant hereto are hereby repealed;

**Article 4**: Inspectors Coordinator General, the Director of General Secondary Education, the Director of Examinations and Certification, Regional Delegates of Secondary Education, Divisional Delegates of Secondary Education, Education Secretaries of various Private Educations Agencies, Principals of public and private schools, each in their own sphere shall be charged with the strict implementation of this order which shall be inserted and published in the Official Gazette in English and French.

Yaoundé, - 9 DEC 2014

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