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

COMPUTER SCIENCE

TEACHING SYLLABUS FORMS III, IV AND V







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INSPECTION DE PEDAGOGIE CHARGEE DE L'ENSEIGNEMENT DE L'INFORMATIQUE
INSPECTORATE OF PEDAGOGY IN CHARGE OF COMPUTER SCIENCE

December 2014

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INSPECTORATE GENERAL OF EDUCATION

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 - English - Living Languages II - Ancient Languages - Literature(in English and in French)
2- Science and Technology	- Mathematics - The Sciences(Physics, Chemistry, Technology, Life and Earth Sciences) - Computer Science
3- Social Sciences/Humanities	- History - Geography - Citizenship Education
4- Personal Development	- Sports and Physical Education - Manual Labour
5- Arts and National Cultures	- National Languages - National Cultures - 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%

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MINISTERE DES ENSEIGNEMENTS SECONDAIRES

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 Healthy professional relationships Social integration
2	Economic life	Discovery of income generating activities Discovery of the job market, social roles, jobs and professions Self confidence, aspirations, talents, self potential Practising healthy eating habits
3	Environment , health and well being	Preservation of the Environment Quest for a healthy life style Choosing and practising a healthy life style
4	Citizenship	Mastery of rules and regulations governing the Cameroonian society Discovery of cultural values and customs of the Cameroonian society
5	Media and Communications	Discovery of the media world 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:** English, French , German, Italian, Spanish, Chinese, Etc.	**French and English , L1** Receptive skills: reading and listening Read in an autonomous way, different types of texts related to areas of life as defined in the syllabus; Listen and understand various texts related to the above mentioned areas of life Productive skills: speaking and writing Produce various types of texts , of average length related to these areas of life; 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 French to Anglophone learners	Communicate accurately and fluently using all four basic skills in language learning; Be able to transfer knowledge learnt in class to real life situations out of the classroom; Be able to cope and survive in problem solving situations;
		Living languages II Receptive skills: reading and listening Read and understand simple texts on social life, citizenship, the environment, well being and health, media etc.. Listen and get oral information in order to simply interact during communication situations related the various domains of life. Productive skills: speaking and writing Sing, recite, dramatise , orally answer questions related to the various domains of life as defined in the syllabus; Write short passages on various familiar topics.

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

		Geography : Develop one's curiosity and knowledge of the world; Get acquainted with landmarks to find your way and fit in the world. **Citizenship Education:** Possess essential knowledge in rights and duties in order to fulfil his/her citizenship.
4- Personal Development	**Moral Education;** **Home Economics;** **Sports and Physical Education** **Health Education**	Develop his / her physical abilities/skills ; Get ready for physical challenges , save and regain energy after physical efforts; Identify risk factors; possess basic knowledge and principles in hygiene and health education; Demonstrate a sense of self control and appreciate the effect of physical activities. Conceive and draw up sports and cultural animation projects; Acquire methods and develop a high sense of efforts; 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;** **National Cultures**	**Artistic Education:** Observe and appreciate works of art; Carry out an artistic activity; Gradually acquire the love for personal expression and creativity; Possess a mastery of creativity in music, plastic arts and the performing arts. Dramatise, recite texts (poems, tales, proverbs, etc.) relating to various areas of society; Practise the different dramatic genres: sketches, comedy, tragedy, drama, etc. **National languages and Cultures** Demonstrate a mastery of Cameroon cultures; Visit the various cultural areas of the country in order to discover

		their characteristics; Demonstrate a mastery of basic rules in writing Cameroonian languages as well as basic grammatical notions applied to these languages; 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 competences	Intellectual and Methodological domains	Solve Problem in a given situation; Use knowledge skills and values with confidence in order to solve real life problems within the different domains of life; With confidence, find useful information to solve problems he/she is faced with; Give his/her opinion ; Support his/her opinion with strong arguments ; Assess him/herself with a view to remediation; Demonstrate basic knowledge in note taking ; Conceive and realise individual projects; Analyse and summarise information, give feedback and report orally or in writing. Develop problem solving approaches; 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; Join team work, fit in a common initiative project /group; Demonstrate interest in cultural activities ; Develop a sense of effort, love for work, perseverance in tasks or activities carried out ; Understand and accept others in intercultural activities; 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.

TEACHING SYLLABUS

COMPUTER SCIENCE

FORM 3, 4, & 5

CLASS	WEEKLY TEACHING LOAD (Hours)	ANNUAL TEACHING LOAD (Hours)	COEFFICIENT
FORM 3	02	50	2
FORM 4	02	50	2
FORM 5	03	75	3

CONTENT

I. Introduction

The rapid growth in computing technologies has within the past decades made remarkable impact in everyday life, be it social, business, education, every facet of society today is impacted by these technologies. These technologies include hardware such as computers, video projectors, interactive white boards, cameras, storage devices and software such as productivity packages (word processing, spread sheets, graphic, presentation packages, etc.). The integration of technology into the teaching learning process is considered as an important process that would enhance comprehension and creativity in the learner for an optimal learning outcome. Thus there is need to design, develop, and implement a curriculum that would enable learners acquire technology skills, develop competence to exploit computers purposefully in a knowledge society, and acquire knowledge of the fundamental principles and concepts of the science involved. The subject here referred to as Computer Science address these curriculum needs.

Computer Science was instituted by the Government of Cameroon as a subject discipline in secondary schools in the 2002/2003 school year. Given its importance it is implemented as a transversal discipline with a view to serve as a component of/and also facilitate ICT integration. Drawn from three main knowledge areas, the syllabus would prepare students to demonstrate digital competency by integrating these knowledge areas: Computer Science, Information and communication technology, and digital literacy. Thus the aims of the syllabus reflect this peculiarity whereby:

Students demonstrate understanding, and apply the fundamental principles and concepts of computer science, analyse problems in computational terms, and have practical experience of writing simple computer programs in order to solve problems.

Students evaluate and apply Information and Communication Technologies, including new or unfamiliar technologies analytically to solve problems including using computers to learn.

Students are responsible, competent, confident and creative users of Information and Communication Technologies.

In this perspective, the syllabuses for Forms Three and Four of Secondary Education are composed of two modules each, while that of Form Five is made up of three modules. Each module outlines the essential competencies to be attained by the learner during the academic year. The total workload consists of 50 hours of teaching for Form 3 and 50 hours of teaching for Form 4 and 75 hours of teaching for Form 5.

II. First Cycle Learner Profile

The profile of learner for the first cycle of secondary school is articulated around the three main knowledge areas:

i. Articulate understanding of fundamental concepts of Computer Science,
ii. Develop problem solving competences,
iii. Exploit ICT purposefully to enhance learning.

These will enable the learner to become digitally competent and thus demonstrate the following competences:

Demonstrate the use of the computer in a range of applications,
Demonstrate an understanding of the characteristics of computer hardware, software and communication systems,
Exploit computer hardware/software features and communication systems
Describe and explain the use of different forms of data organisation and processing,
Articulate the need for a systematic approach to the solution of problems, and identify where, in its solution, a computer would be appropriate,
Demonstrate understanding of basic algorithms in programming, and deduce results from conditional statements (choice and iteration),
Articulate understanding of the social, environmental, health, economic, security issues and consequences when computers are used,
Select and apply appropriate techniques for the computer based solution of problems,
Design, implement, and document effective solutions to problems, using appropriate hardware and software,
Evaluate relative importance and or consequences of computers in various life situations,
Articulate understanding of trends in technology advances and evaluate impact on society.

III. Learning Domain and Corresponding Disciplines

The Computer Science syllabus for Forms Three, Four, and Five of secondary school is within the learning domain of **Sciences and Technology**, which regroup other subjects including:

Mathematics,
Biology,
Physics,
Chemistry;
Technology.

IV. Contribution of Computer Science Syllabus to Learning Domain

The First cycle syllabuses have been designed to initiate learners to basic concepts of Computer Science by introducing a collection of essential knowledge and competences that would enable the learner use computer and various collaborative and development tools to solve problems. The learner would explore and exploit the computer and develop aptitudes in manipulating the computer system devices including software to realize various tasks and to enhance learning in other domains such as: the arts, natural languages and cultures, and human sciences.

V. Contribution of Computer Science Syllabus to Life Situations

All domains of life are concerned by the tremendous development of computing technologies. Nevertheless, Computer Science is implemented as a transversal discipline and it integrates well in all domains of life including the following life-study area

Table 1: Summary of contribution of Computer Science syllabus to Life Situation

LIFE SITUATION	CONTRIBUTION
Social and family life	Study and appraise business correspondence Prepare home budgets Manage domestic chows Manipulate electronic devices Communicate and disseminate information
Business	Develop and manage business databases Make rational use and management of resources and services Research and employment Project planning implementation and evaluation Digital services Entrepreneurship
Environment, Health, and well-being	Protect nature Develop and manage databases of sites Practice e-healthcare including telemedicine Take actions and act wisely to protect and harness the environment
Citizenship	Use the computer resources purposefully Manage privacy and intellectual property Protect public utilities
Media and communication	Facilitate communication through multimedia resources Manage multimedia resources Manipulate communication devices (cell phones, radio, etc.)

VI. Family of Life Situations Addressed by the Computer Science Syllabus

In order to develop competencies in learners, the Computer Science syllabus explores the following family of life situations:

Use of Application packages,
Exploiting Operating systems and Network platforms,
Employing algorithmic reasoning and exploiting software development tools to solve simple problems,
Hardware Systems and System Maintenance,
Information Systems development,
Databases and Data Resource Management,
Technology in society, People and Computer Systems,
Study of number systems;
Software development.

VII. Summary Table of Modules of Computer Science Syllabus

Table 2: Modules outline for Forms Three, Four, and Five

Level	Modules	Duration
Form 3	**Module1**: Operating System and Networks	25 H
	Module 2: Application Packages; Algorithm concepts	25 H
Form 4	**Module 1**: Hardware Systems and System Maintenance	25 H
	Module 2: Number systems; Software Development Tools	25 H
Form 5	**Module 1:** Information Systems and Data Resource Management,	25 H
	Module 2: Technology and Society; People and Computer Systems	25 H
	Module 3: Software development, Projects	25 H

VIII. Presentation of Modules

A) Modules for Form Three

A.1: MODULE 1

A.1.1 TITLE OF MODULE: OPERATING SYSTEM AND NETWORKS

Duration: 25 H

A.1.2 PRESENTATION OF MODULE

This module seeks to develop in the learner basic competencies needed to understand and effectively exploit features of computer networks and operating system platforms to be productive. This module would lead the learner to articulate an understanding of operating system and networks, evaluate the benefits and limitations of communication networks, explain the role of OS in device management, process management, and resources management, and discuss technology issues (ethical, privacy, crime, piracy, emerging technologies).

A.1.3 CONTRIBUTION OF MODULE TO CURRICULAR GOALS AND ACHIEVEMENT

This module would enable learners work efficiently in computer network platforms and also employ operating system to be productive in the economic, Social and Family, and Media and communication life domains.

A.1.4 CONTRIBUTION OF MODULE IN THE LEARNING DOMAIN

The module is expected to lead the learner to explore and identify components of computer networks and functions of operating systems. The learner would also develop a wide range of competencies that would lead the learner to:

Articulate an understanding of operating system and network technologies,
Evaluate relative importance of operating system and network technologies,
Exploit operating system, networks, and system tools.

A.1.5 CONTRIBUTION OF MODULE TO THE TEACHING SYLLABUS AND OTHER DOMAINS OF LIFE

This module would enable the learner to:

Select and use computer network resources,
Facilitate sharing of knowledge and other resources,
Uphold ethical and responsible attitudes when using computers.

A.1.6. TABLE OF MAIN COMPONENTS OF MODULE 1

CONTEXTUALISATION		COMPÉTENCES TO BE ATTAINED		RESSOURCES			
Family of life situations	**Examples of life situations**	**Categories of actions**	**Examples of actions**	**Basic Knowledge**	**attitudes**	**Other resources**	**Duration**
Computer network platform	Job Search Planning to travel to other places Change of living environment Exploration of a country, its culture, its history and its geography Understanding a technology Updating ones knowledge Interpretation of news Self-learning E-Communication Participation in social and cultural activities Computer assisted learning	**Exploit a computer network platform**	Describe the different types of networks Evaluate importance and limitations of networks. Describe network topologies Evaluate importance and limitations of network topologies Describe the different Network architectures Describe configuration of a computer network (protocol, IP Address..) Explain network addressing (static, dynamic) Evaluate the need for security measures in networks, (user access levels, passwords, and encryption). Evaluate network policies (acceptable use, data recovery,..) Enumerate the basic equipment of a network Articulate understanding of the role of networking equipment (cables, Ports, network card, etc) Describe communication modes Explain Network operating system (protocols Dialling software, File Transfer software, etc.) Explain the functioning of the third-layer component of a network Connect a computer to a (wired or wireless) network Explain the different roles of computers in a client-server or in a peer-peer network Share a resource (printer, disk drive, etc.)	Computer Network, Types of Network Network Topology, Network Protocol, Server, Client, IP Address, Network hardware Router Gateway, Gateway, Subnet Mask, Domain, Switch, Hub DNS - DHCP server, modem, optic fibres Communications media Simplex, half duplex, full duplex	Team work Collaborative Honest and diligence Accountability Communicative Critical thinking Creative Ethical Logical reasoning Self- discipline	**DIDACTIC** Computer Laboratory Specialized Software Computer Text books Specialized Journals Digital Resources Tutorials Projector screen Overhead Projector Interactive Whiteboard (IWB) Project manual	7 H

CONTEXTUALISATION		COMPÉTENCES TO BE ATTAINED		RESSOURCES			
Family of life situations	**Examples of life situations**	**Categories of actions**	**Examples of actions**	**Basic Knowledge**	**attitudes**	**Other resources**	**Duration**
Computer network platform	Access resources and other networks Communication with other networks Access to resources Academic and professional research	**Use a browser to access the Internet**	Explain terms : internet, the Internet, browser, URL Evaluate importance and areas of application of the internet Trace evolution and identify basic components of the internet Differentiate between the Internet and the Web (www) Use different web technologies: email, search engines Explain the notion of Internet Service Provider Identify Internet Service Providers in the country Describe the characteristics of a good ISP (access, speed, reliability etc.) Explain the services offered on the Internet (mail, Relay Chat) Access Internet services through a browser Navigate through web pages Describe common file standards associated with the Internet Evaluate the importance of compressing files that are transmitted via the Internet.	internet the Internet Surfer, Hyperlink Internet Services Provider (ISP), www, e-mail, FTP, Chat, and IP Telephony JPG, GIF, PDF, MP3, MP4 MPEG Menu, Tool bars, URL Download, upload Web Site Electronic Mail URL Search engines Browser		**HARDWARE** Computers & accessories Digital Camera network hardware: connectors Cables, etc Crimping pliers Cable Tester USB Key Media	2 H
		Search Information on the Internet	Describe and identify search engines Outline steps in carrying out research on the Internet Prepare a search Use a search engine Download a digital resource Select the sites after the result of a query Bookmark the important links Organize the marked pages			**HUMAN** Teacher IT specialist	2 H
Digital services	Computer aided manufacturing Online services	**Reservations, Digital services**	Discuss the concepts involved in online marketing (advertisements, shopping, banking etc.) Evaluate digital services (E-commerce, E-learning, etc)	e-health care e-business e-library etc			2H
Exploiting Social Network platforms	Communicate with other people	**communicate with other people** **Respect social communication ethics**	Exploiting social network: (Facebook, Twitter, Skype) Send an instant message to one or more users: Join a social network group Add new people to an account, Configure an account to be visible or invisible to others. Communicate via chats, blogs, groups and forums	Facebook Blog forums YouTube		**DIDACTIC** Computer Laboratory Specialized Software Computer Text books Specialized	2H

CONTEXTUALISATION		COMPÉTENCES TO BE ATTAINED		RESSOURCES			
Family of life situations	**Examples of life situations**	**Categories of actions**	**Examples of actions**	**Basic Knowledge**	**attitudes**	**Other resources**	**Duration**
Exploiting operating system platforms	Proper functioning of a device Securing Data Protecting Equipment Using automated tools to improve productivity and collaboration System user tools Collaborative tools	**Exploit the features of an operating system**	Identify operating system platforms Describe the functions of an operating system Identify types of operating systems Describe the booting process of a computer Modify the date/time of a computer Use help menu Configure the devices (keyboard, printer, screen)	Operating System Application Software User Session Control Panel Device Manager Menus CD, DVD, optical drive USB Port Command line GUI Sound Voice, audio, natural language) Interactive interface Quality of a good interface	Team work Collaborative Honest and diligence Accountability Communicative Critical thinking Creative Ethical Logical reasoning Self- discipline	Journals Digital Resources Tutorials Projector screen Overhead Projector Interactive Whiteboard (IWB) Project manual	6H
		Human computer Interface	Define a computer interface Describe various human computer interfaces Evaluate the role of interactive HCI Explain the need for a good interface design: colour, help facility, dialogue boxes, menus etc.				2H
		Organize data on media	Describe the organization of data on a disk-magnetic, optical Differentiate between a file and a folder Perform operations on a file Perform operations on a folder Read from and write to a medium				1 H
		Enhance productivity **Organise data on a storage device**	Install devices with help of device drivers Run an antivirus Defragment a storage medium Compress software Convert Text to table /table to text Utility software	File, Folder Explorer Shortcuts Device driver User tools Music, picture, downloading tools			1H

A.2 MODULE 2

A.2.1 TITLE OF MODULE: APPLICATION PACKAGES; ALGORITHM CONCEPTS

Duration: 25 H

A.2.2 PRESENTATION OF MODULE

This module has as goals to encourage the learner to:

Discuss types of productivity tools (Word processor, Spread sheet, Presentation etc),
Use advanced functions of productivity tools,
Identify characteristics of an algorithm,
Exploit software development tools to implement simple algorithms.

A.2.3 CONTRIBUTION OF MODULE TO ACHIEVEMENT AND CURRICULAR GOALS

This module would enable learners to be productive in order to exercise societal roles in business, social and family life, and above all in media and communication world.

A.2.4 CONTRIBUTION OF MODULE IN THE AREA OF LEARNING

This module would lead the learner to carry out word processing, manage spread sheets, presentations and make of other productivity tools. These competences would be employed by learner to facilitate knowledge and skills acquisition in other disciplines in the domain of science and technology:

Select and exploit application package that is suitable for a given task,
Facilitate sharing of knowledge and other resources,
Evaluate relative importance of each application package.

A.2.5 CONTRIBUTION OF MODULE TO THE TEACHING SYLLABUS AND OTHER DOMAINS OF LIFE

The main objective is to encourage the learner to become autonomous with the computer. In this regard, the learner should be able to identify and select appropriate productivity tools with respect to the task at hand and uphold ethical and responsible attitudes

A.2.6. TABLE OF MAIN COMPONENTS OF MODULE 2

CONTEXTUALISATION		COMPETENCIES TO BE ATTAINED		RESOURCES			
Family of life situations	**Examples of life situations**	**Categories of actions**	**Examples of actions**	**Basic knowledge**	**Attitudes**	**Other Resources**	**Duration**
Production of digital documents	preparing a correspondence preparing a presentation Producing statistics Managing stock Tracking expenditure Preparing a budget (school, Home) Preparing a list of items Preparing payoll Preparing a cultural activity Preparing a communication Drafting a message	**Improve the quality of a document (editing, formatting)**	Insert objects (table, image, bullets, numbering, header, footer, Word Art, drop cap) Exploit advanced features of word processors Perform mail merge Generate a table of contents, List of Figures, etc.	Menus Toolbars Spread sheet Workbook Cell Formatting Slide Animation	Team work Collaborative Honest and diligence Accountability Communicative Algorithmic thinking Critical thinking Creative Ethical Logical reasoning Systemic reasoning Self-discipline	**DIDACTIC** Computer Laboratory Specialized Software Computer Text books Specialized Journals Digital Resources Tutorials Projector screen Overhead Projector Interactive Whiteboard (IWB) Project manual Tutorials	15H
		Efficient arithmetic operations	Identify the parts of an electronic spread sheet Describe cell addresses Perform simple arithmetic operations (addition, subtraction, multiplication, division, average) Navigate within a spread sheet Select a range of cells in a spread sheet Do a page set-up and print the data in a worksheet Manage workbook sheets (rename, move, copy ,)				
		Produce a slideshow Design invitations, post cards , Brochures, Newsletters etc.	Design a presentation Design and create a slide show Add and delete slides Add effects (animation, sound, transition) Insert illustration (pictures, shapes, picture.) Insert Building blocks (page parts, calendar etc.)				
Database systems	Introduction to Database	**Record simple transactions**	Define Databases Components of database Identify Models of databases	Database models Hierarchical, , networked etc			4H
Algorithmic reasoning Using development tools	Design solution to problems Automating tasks Tracking process Compliance with procedures	**Characterize an algorithm Implement simple algorithms**	Identify task with algorithmic solutions Identify the parts of an algorithm Identify simple instructions Identify instructions blocks Dry run a simple algorithm Guided implementation of algorithm Exploit a graphic programing productivity tool	Algorithm Characteristics an algorithm		**HUMAN** Teacher IT Specialist	6H

B) Modules for Form Four

B.1. MODULE 1

B.1.1 TITLE OF MODULE: HARDWARE SYSTEMS AND SYSTEM MAINTENANCE

Duration: 25 H

B.1.2 PRESENTATION OF MODULE 1

This module would lead the learner to:

Describe hardware devices,

Explain hardware systems including basic hardware architecture,

Ensure the functioning of the computer system through maintenance (preventive, adaptive, repairs, Hardware diagnostics).

B.1.3 CONTRIBUTION OF MODULE 1 TO ACHIEVEMENT AND OTHER CURRICULAR GOALS

The competencies acquired through this module "hardware systems software and system maintenance" would permit the learner to exercise its societal roles in the following life domains; Economy life, Social and Family life, and Media and communication.

B.1.4 CONTRIBUTION OF MODULE IN THE AREA OF LEARNING

The module is expected to lead the learner to explore, identify hardware components and its functions. This module would lead the learner to develop a wide range of competencies to exploit hardware systems to be productive and to employ maintenance tools to ensure the functioning of a computer system. The learners would:

Articulate an understanding of the functioning of a hardware system,

Evaluate relative importance of maintenance for a computer system,

Exploit maintenance tools to ensure the continuous functioning of a computer system.

B.1.5 CONTRIBUTION OF MODULE 1 TO THE TEACHING SYLLABUS AND OTHER DOMAINS OF LIFE

The main objective is to encourage the learner to become confident when using the computer. In this regard, the learner should be able to ensure the proper functioning of the computer system.

B.1.6 TABLE OF MAIN COMPONENTS OF MODULE 1

CONTEXTUALISATION		COMPÉTENCES TO BE ATTAINED		RESSOURCES			
Family of life situations	**Examples of life situations**	**Categories of actions**	**Examples of actions**	**Basic Knowledge**	**attitudes**	**Other resources**	**Duration**
Selecting Computer Hardware Assessing functionalities of Hardware	Selecting suitable Hardware Use of appropriate device Acquisition of digital devices Installation of digital devices Scanning of documents Use of a tutorial	**Identifying hardware** **Selecting suitable hardware for a given task**	Identify input devices Identify output devices Identify the characteristics of a computer Relate characteristics to functionalities Describe the types of memory in a computer Describe components of processor Explain the machine cycle Describe nature of buses Identify main components of the motherboard	Peripheral devices System unit Memory Processor features Motherboard Buses BIOS, CMOS, Sockets, processor, expansion cards Software Utilities Maintenance File, Directory Update, upgade Defragmentation Partitioning Logic gate : AND, OR, NOT Simple logic circuits Truth tables	Team work Collaborative Honest and diligence Communicative Algorithmic thinking Critical thinking Creative Ethical Logical reasoning Systemic reasoning Self-discipline	**DIDACTIC** Computer Laboratory Specialized Software Computer Text books Specialized Journals Digital Resources Tutorials Projector screen Overhead Projector Interactive Whiteboard (IWB) Project manual **HARDWARE** Computers Digital Camera USB Key Media	10 H
	Customising a digital work environment Installation and use of applications	**Identifying and Selecting suitable software for a given task**	Explain system software and types Explain application software & types Identify desirable attributes of given software. Describe how to acquire a software Differentiate types of software Differentiate firmware, hardware Select suitable software				4 H
Building logic circuits.	Representation of digital signals Combining digital signals	**Identifying and Combining basic logic gates logic to produce logic circuits**	Identifying the logic gates: AND, OR, NOT, NAND, NOR, XOR. Sketching logic gates symbols Demonstrate functions of logic gates with truth tables. Designing simple logic circuits Analysing simple logic circuits Derive truth table from a given logic circuit				4H

CONTEXTUALISATION		COMPÉTENCES TO BE ATTAINED		RESSOURCES			
Family of life situations	**Examples of life situations**	**Categories of actions**	**Examples of actions**	**Basic Knowledge**	**attitudes**	**Other resources**	**Duration**
Ensuring the functionality of computer systems	Management and protection of data on a disk Use of an appropriate game application Disassembly and assembly of computer Hardware Trouble-shoot basic hardware faults Caring for a computer Selecting appropriate hardware for a task Disc crash Virus attack	**Ensure the proper functioning of the computer system** **Securing the computer from failure and damage** **Trouble shooting basic hardware and software fault**	Define the terms virus, antivirus Identify the types of maintenance State the various ways of protecting software State the various ways of protecting equipment Characteristics of a file (name, extension, size, creation date, location, default application) Scan a storage medium Install, repair, and uninstall software (operating system, office suite, antivirus etc.) Delete an application Update an antivirus Check errors on a Storage medium Defragment a Storage medium Identify partitions Cleaning a storage medium Using UPS, surge suppressors Troubleshooting	Maintenance: Preventive, Adaptive, Hardware diagnostic Repairs Compatibility	Team work Collaborative Honest and diligence Accountability Communicative Algorithmic thinking Critical thinking Creative Ethical Logical reasoning Systemic reasoning Self- discipline	printed circuits Surge protectors UPS Device drivers Basic hardware maintenance tools	6 H

B.2. MODULE 2

B.2.1 TITLE OF THE MODULE: DATA REPRESENTATION; SOFTWARE DEVELOPMENT TOOLS

Duration: 25 H

B.2.2 PRESENTATION OF MODULE 2

This module would allow the learner to demonstrate an understanding of number systems. The learner is also expected to demonstrate an understanding of algorithmic thinking in problem-solving, and appreciate the role of logic and logical thinking in problem-solving. They should be able to employ software development tools, implement simple algorithms, and understand how a simple piece of software might have been developed.

B.2.3 CONTRIBUTION OF THE MODULE TO ACHIEVEMENT AND OTHER CURRICULAR GOALS

This module would allow the learner to demonstrate algorithmic thinking in problem-solving, and appreciate the role of logic and logical thinking in problem-solving. The learner would exploit software development tools to design algorithms, implement simple algorithms.

B.2.4 CONTRIBUTION OF MODULE 2 IN LEARNING AREAS

The module would enable the learner to develop competencies needed to facilitate problem solving in the Sciences and technology learning domain as well as in the other domains. The learner would be able:

Articulate an understanding of number systems,
Articulate an understanding of software development tools,
Evaluate relative importance of software development tools,
Exploit software development tools to implement simple algorithms.

B.2.5 CONTRIBUTION OF MODULE 2 TO THE TEACHING SYLLABUS AND OTHER DOMAINS OF LIFE

This module has as goal to develop in the learner competencies that would permit in a given life situation, the ability to solve problems of daily living. Consequently, the learner should be able to:

Select and use software development tools,
Uphold ethical and responsible attitudes.

B.2.6 TABLE OF MAIN COMPONENTS OF MODULE 2

CONTEXTUALISATION		COMPETENCIES TO BE ATTAINED		RESOURCES			
Family of life situations	**Examples of life situations**	**Categories of actions**	**Examples of actions**	**Basic knowledge**	**Attitudes**	**Other resources**	**Duration**
Representing data for a computer Working with files and data types Units of measurements of data	Explaining how information is represented in a computer Data theft Manipulating numerals Working with different file formats. Choosing an appropriate data type units of measurement of data	**Representing information in a computer**	Define bit. Representing numbers. Representing characters (ASCII & EBCDIC) Representing instructions.	Bit Coded systems Instruction sets Binary representation	Team work Collaborative Honest and diligence Accountability Communicative Algorithmic thinking Critical thinking Creative Ethical Logical reasoning Systemic reasoning Self- discipline	**DIDACTIC** Computer Laboratory Specialized Software Computer Text books Specialized Journals Digital Resources Tutorials Projector screen Overhead Projector Interactive Whiteboard (IWB) Project manual Spread sheet or database application Different files from different applications	3H
		Encryption, decryption of information	Define terms: Data, Information, Code, coding. Explain Characteristics of Information	Encryption Decryption			1H
		Use of the number systems	Identify the notations of commonly used bases (bases 2, 8, 10 and 16) Convert from one base to another , Perform addition and subtraction in base two.	Symbols Conversion Information Units of measurement			4H
		Identifying the different file formats	Identify file formats Verify file formats Differentiate file formats	video: avi, mpeg, … database: dbf, mdb, Hypermedia: html, .. sound: wav, mp3 documents: txt, doc... graphics: jpeg, tiff, system application.exe sys			1H
		Working with simple data types	Articulate understanding of data types. Identify simple data types: Numbers (integers and real numbers, Characters, String, Money, Date and time, Boolean) Appreciate the existence of other data types; complex data types: arrays and records.	Simple data types Structured or complex data types			2H
		Selecting appropriate units	State the units of measurement in computing, their multiple and sub-multiples, Convert from one unit to another Explain the following units: Inch, DPI, Hertz, BPS, Pixel and X,	Units: Byte, Kilo Bytes, Mega Byte Giga Byte, Tera byte			2H

CONTEXTUALISATION		COMPETENCIES TO BE ATTAINED		RESOURCES			
Family of life situations	**Examples of life situations**	**Categories of actions**	**Examples of actions**	**Basic knowledge**	**Attitudes**	**Other resources**	**Duration**
Advanced features of spread sheet	Monitoring expenditures Preparing budgets Preparing costings Ranking items Selecting options	**Carrying out Calculations in a spreadsheet** **Exploit advanced features of a spread sheet**	Enter a formula Copy a formula Use the text features (Find, Replace, concatenate) Use the Date and Time Features Use the mathematical functions (sum, product, average, min, max, rank count-if , the add-if) Insert a chart Use conditional formatting	Selection Formula Function Formatting Graph		Teacher Computer laboratory Computer manual Internet connection Simulation and models many algorithms Samples of simple programs	5H
Solving familiar or unfamiliar problems	Identifying steps to solve a problem. Working in an IDE.	**Selecting programming languages** **Exploit development tools.**	Differentiate between programing languages. Explain programing paradigms: imperative, declarative, and object, oriented paradigms. Evaluate the importance development tools: compiler, interpreters, and assemblers.	Object-oriented Declarative Imperative Compliers Interpreter Assembler Text editor	Team work Collaborative Honest and diligence Accountability Communicative Algorithmic thinking Critical thinking Creative Ethical Logical reasoning Systemic reasoning Self- discipline		7H
		Identifying algorithmic control structures	Identify control structures in an algorithm Evaluate the importance of control structures in algorithms Select a suitable control structure to solve a given problem	Characteristics of algorithm Sequence Choice Loop(Iteration)			
		Writing algorithms	Write simple algorithms using development tools Test and correct errors in algorithms	Pseudo code Flow chart. logic errors syntax errors Semantic			

C) Modules for Form Five

C.1: MODULE 1

C.1.1 TITLE OF MODULE: INFORMATION SYSTEMS, DATA RESOURCE MANAGEMENT

Duration: 25 H

C.1.2 PRESENTATION OF MODULE

Learners should be able to demonstrate a general understanding of system design. They should be able to select and design appropriate ways of organising data within a system and discuss the merits of different forms of data organisation. They should be able to select suitable software and hardware for a given task and to justify their choice

C.1.3 CONTRIBUTION OF MODULE TO CURRICULAR GOALS AND ACHIEVEMENT

This module would allow the learner to demonstrate an understanding of information systems. The learner would exploit Data management resources to facilitate problem solving.

C.1.4 CONTRIBUTION OF MODULE IN THE LEARNING DOMAIN

The module would enable the learner to develop competencies needed to facilitate problem solving in the Sciences and technology learning domain as well as in the other domains.

Articulate an understanding information systems,
Articulate an understanding of database systems,
Evaluate relative importance of System Development Life Cycle,
Exploit data management resources to facilitate problem solving.

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C.1.5 CONTRIBUTION OF MODULE TO THE TEACHING SYLLABUS AND OTHER DOMAINS OF LIFE

This module has as goal to develop in the learner competencies that would permit in a given life situation, the ability to solve problems of daily living. Consequently, the learner should be able to:

Select and use system development tools,
Uphold ethical and responsible attitudes.

C.1.6 TABLE OF MAIN COMPONENTS OF MODULE 2

CONTEXTUALISATION		COMPETENCIES TO BE ATTAINED		RESOURCES			
Family of life situations	**Examples of life situations**	**Categories of actions**	**Examples of actions**	**Basic knowledge**	**Attitudes**	**Other resources**	**Duration**
Types of information system Develop an Information system	Information system in an organisation School management Information system, Library management information system Hospital management Information System	**Identifying components of an IS** **Designing an information system for an organisation**	Define an Information System Describe functional components of an Information System Identify basic functions of an organization Describe Management levels within an organisation Identify types of information systems in an organisation (TPS, EIS, DIS) Evaluate characteristics of different types of IS in an organisation Information flow within an organization Security of systems	Define terms Organization Management levels Information flow Management IS Processing IS Management support Transaction processing Commercial and General data processing systems Stock control Banking system	Team work Collaborative Honest and diligence Accountability Communicative Algorithmic thinking Critical thinking Creative Ethical Logical reasoning Systemic reasoning Self- discipline	**DIDACTIC** Computer Laboratory Specialized Software Computer Text books Specialized Journals Digital Resources Tutorials Projector screen Overhead Projector Interactive Whiteboard (IWB) Project manual	6H
Systems	Modelling Systems Simulating Systems Monitoring and control systems	**Modelling and simulating systems**	Explain systems modelling, simulation Evaluate advantages of simulation and modelling Perform what-if-analysis using spread sheet	Notions of Simulation Modeling Spreadsheet functions			2H
		Identifying monitoring systems and control systems	Explain monitoring systems Explain control system Identify areas where monitoring systems are used (e.g in organisations, security networks) Identify areas where control systems are used (eg in production lines; patient, environment, traffic -rail, air, road).	Monitoring system Control system			2H
		Defining the system	Problem definition and feasibility study Evaluate existing system: manual or computerized Suggest possible options for new system :	System definition System specification			1H
		Analyzing a system.	Analyse systems and evaluate options Review system development plan	System analysis			1H

System development Life Cycle	Analyzing a system. Designing a computerized system Using project management strategies	**Designing a system**	Select appropriate hardware, software, and interfaces. Propose a step-by-step solution to the problem *Tools:* charts, pseudo code, flow diagrams	System design interface design		Teacher Computer laboratory Computer manual Internet connection Digitalized resources Specialized resources Access to community library.	1H
		System Development and Testing **Data capture**	Make a choice of appropriate coding system or software design (implementation choice). Use the test plan and correct errors.. Devise a test plan and a checking cycle Describe types and sources of data, Outline selection methods of data capture and data verification. Describe common methods of validating data: length checks, type checks, range checks, presence checks, check digits-parity	coding test plan Data capture data collection instrument: questionnaire, interview, etc			4H
		Implementing a system	Describe the flow of data in the system. Describe system security. Different methods of implementation	conversion methods Parallel, pilot, plunge, piece meal			2H
		Providing system support	Writing user documentation: use data flow diagrams, flow charts to outline user manuals and tutorials Writing technical documentation: precautions to be taken, basic maintenance strategies, models and simulation etc. Define monitoring and system control measures.	Notions of Monitoring system Control system User manuals Tutorials Technical documentation			2H
Data Resource management	Developing an information system Security of Data	**Identifying tools, models and strategy to develop an IS** **Record simple transactions** **Check for redundancy in data storage**	Structure of an organisation Describe the purpose and required outcome of an information system Data types Components of database Populate a simple database Explain data mining Data security Describe data organisation	Architectural requirements Organisation of data Concept of database			6H

C.2 MODULE 2

C.2.1 TITLE OF MODULE: TECHNOLOGY AND SOCIETY, PEOPLE AND COMPUTER SYSTEM

DURATION**: 25 H**

C.2.2 PRESENTATION OF MODULE

Learners would be able to evaluate the importance and limitations of using computers (health, economic, governance, education etc). They would also demonstrate an understanding of the ethical and moral obligations on leaders, managers and users of computers, and the implications of global communications for society. Learners would be able to describe the roles and responsibilities of people who work with computer systems, select suitable software, hardware and development tools for a given technology task and justify choice, and also evaluate issues of emergent technologies and its impact on society.

C.2.3 CONTRIBUTION OF MODULE TO CURRICULAR GOALS AND ACHIEVEMENT

The learner would by the end of this module, be able to discuss issues of computer system people and society, checking outcomes obtained from processing information through computer use, and respect of basic intellectual proprietary rights. Some of these activities are designed to contribute to the development of the learner's sense of responsibility.

C.2.4 CONTRIBUTION OF MODULE IN THE LEARNING DOMAIN

The module is expected to lead the learner to explore, identify issues of technology use and how it impacts the society and also appraise trends in technology. The learner would:

Articulate an understanding of the impact of technology on the society,
Articulate an understanding of the impact of computer systems on people,
Evaluate relative impact computer system on people and the society (e.g. environment),
Exploit computer system/technology resources to limit negative impact,
Estimate advantages and possible challenges of emergent technologies.

C.2.5 CONTRIBUTION OF MODULE TO THE TEACHING SYLLABUS AND OTHER DOMAINS OF LIFE

This module would enable the learner to:

Uphold ethical and responsible attitudes,
Prevent negative impacts such as health hazards, waste disposal, etc.,
Select and use computer system purposefully.

C.2.6 TABLE OF MAIN COMPONENTS OF MODULE 2

CONTEXTUALISATION		COMPETENCIES TO BE ATTAINED		RESOURCES			
Family of life situations	**Examples of life situations**	**Categories of actions**	**Examples of actions**	**Basic knowledge**	**Attitudes**	**Other resources**	**Duration**
Career in Information Technology Impact of computers on People and the workplace Health and safety when using technology	Choosing a career Proper waste disposal Design of a technology platform/environment	**Search for computer occupations**	Describe the roles and responsibilities of computer systems specialists	Computer occupations network manager software engineer The workplace ergonomics Social and economic effects on people, organisations and society	Team work Collaborative Honest and diligence Accountability Communicative Algorithmic thinking Critical thinking Creative Ethical Logical reasoning Systemic reasoning Self- discipline	**DIDACTIC** Computer Laboratory Specialized Software Computer Text books Specialized Journals Digital Resources Tutorials Projector screen Overhead Projector Interactive Whiteboard (IWB)	2H
		Identify occupational hazards	Explain Health concerns repetitive stress injury (RSI), carpal tunnel syndrome(CTS). Appraise the need for ergonomic design of technology & technology environments: height of computer tables & chairs.				4H
		Identify effects of computer system on people	Describe the impact on people of changes to existing production methods & services, New opportunities for employment within and out of Cameroon. Explain the effects of global communication. Outline history of computers and effects of changing technology in society.				5H

CONTEXTUALISATION		COMPETENCIES TO BE ATTAINED		RESOURCES			
Family of life situations	**Examples of life situations**	**Categories of actions**	**Examples of actions**	**Basic knowledge**	**Attitudes**	**Other resources**	**Duration**
Technology and society Technology and everyday life	Buying and selling online Receiving health care online Computers used for quality control Computers used for manufacturing Learning with the computer	**Identifying issues impacting computer use** **Providing digital services** **Providing Computer Aided Production** **Integrating ICT in: education, business, commerce, the art manufacturing, health care, education and entertainment, media**	Explain the need to ensure privacy Explain types of computer crime: Outline measures to check crime Describe Computer Malware. Describe methods used to guard against malware: Explain appropriate use of technology and sources of misuse, (simple scenarios) Examples of codes of conduct: BCS, ACM, IEEE. Evaluate applications of Social networks e.g. web communities, e-commerce, e-learning. ICT in Learning in the classroom Measures to combat computer crime Evaluate Impact of Social Networks Identify ethical issues	Social and economic effects on people, organisations and society Security of computer systems Computer crime Ethical issues E-commerce ATM Telemedicine commuting Robot Quality control E-learning Distance learning	Team work Collaborative Honest and diligence Accountability Communicative Algorithmic thinking Critical thinking Creative Ethical Logical reasoning Systemic reasoning Self- discipline	Project manual Computer Laboratory Productivity suits Project manual Specialized resources Digitalized resources Digitalized resources	5 H
Databases	Recording transactions	**Record simple transactions** **Check for redundancy in data storage verification and validation of data.**	Define Databases Identify Models of databases Components of database Use a database application to create a simple relational database Populate a simple database Create simple queries to demonstrate data integrity and consistency.	Concept of database Hierarchical, networked, multidimensional etc Field Record Table Form Query			5H
Implementing projects	Investigating processes Reporting and evaluating correctness of solutions to projects	**Managing a projects.**	Explain the concept of a project. Explain Planning, monitoring, and control as in projects Explain project management terms: earliest start time, earliest finish time, slack time, lag time, float time, milestone, event, task, critical task, etc. Outline project management tools, techniques and models Use project management tools to facilitate the execution of projects: Gantt and PERT charts.	Notions on project management: Stages Management Tools, Scope Cost Event Project Management Issues			4H

C.3: MODULE 3

C.3.1 TITLE OF MODULE: SOFWARE DEVELOPMENT, PROJECTS

Duration: 25 H

C.3.2 PRESENTATION OF MODULE

This module would allow the learner to demonstrate algorithmic thinking and appreciate the role of logic and logical thinking in problem-solving. They would be able to design and implement simple algorithms and understand how a simple piece of software might have been developed. The learner would carry out and report minor projects. The learner would investigate and report the processes and results, and evaluate the correctness of the results. Learners would be expected to:

Articulate understanding of programming concept and programming languages,
Exploit Integrated Development Environment (IDE),
Implement/carry out and report a minor project,
Evaluate the correctness of the results of minor projects.

C.3.3 CONTRIBUTION OF THE MODULE TO ACHIEVEMENT AND OTHER CURRICULAR GOALS

This module would allow the learner to demonstrate algorithmic thinking in problem-solving, investigation and reporting solution to problems and simple projects. The learner would exploit development tools to design algorithms, implement simple programs, and understand how a simple piece of software might have been developed. Carry out minor projects and write a report of the process.

C.3.4 CONTRIBUTION OF MODULE 3 IN LEARNING AREAS

The module would enable the learner to develop competencies needed to facilitate problem solving, investigation, and reporting of minor projects in the Sciences and technology learning domain as well as in the other domains. The learner is expected to:

Evaluate relative importance of software development tools,
Investigate and report minor projects.

C.3.5 CONTRIBUTION OF MODULE 3 TO THE TEACHING SYLLABUS AND OTHER DOMAINS OF LIFE

This module has as goal to develop in the learner competencies that would permit in a given life situation, the ability to solve problems of daily living. Consequently, the learner should be able to:

Provide logical solutions to problems,
Uphold ethical and responsible attitudes,
Investigate and report solution to problems and processes.

C.3.6 TABLE OF MAIN COMPONENTS OF MODULE 3

CONTEXTUALISATION		COMPETENCIES TO BE ATTAINED		RESOURCES			
Family of life situations	**Examples of life situations**	**Categories of actions**	**Examples of actions**	**Basic knowledge**	**Attitudes**	**Other Resources**	**Duration**
Solving Problems using algorithms Realizing minor projects	Developing algorithms to solve problems. Exploiting development tools. Automating tasks Process Tracking Compliance with procedures Implementing and reporting minor projects Preparing multimedia presentations Designing simple graphics. Creating and	**Selecting programming languages** **Exploit development tools.**	Explain programming paradigms Evaluate importance development tools: compilers, interpreters and assemblers.	Object-oriented Declarative Imperative Compliers Interpreter Assembler Text editor	Team work Collaborative Honest and diligence Accountability Communicative Algorithmic thinking Critical thinking Creative Ethical Logical reasoning Systemic reasoning Self- discipline	Computer s and accessories Computer manual Internet connectivity Simulation and models Samples of simple Algorithms	2H
		Identifying algorithmic control structures.	Identify control structures in an algorithm Evaluate the importance of control structures in algorithms Select a suitable control structure in a given problem	Characteristics of algorithm Sequence Choice Loop(Iteration) Recursive			2H
		Representing algorithms.	Write out simple algorithms using: pseudo code, flow charts, data flow diagrams Test and correct errors in algorithms Give the characteristics of good algorithms. Determine the complexity of an algorithm.	Algorithm characteristics Pseudo code Flow chart. Complexity			4H
		Running simple programs **Testing for correctness.**	Develop simple code fragments from algorithms using a standard programming language: C, Java Use formatting language: java script, Compile and run the programs Explain the need for a good programing style. Establish correctness of algorithm developed. Assess the program developed for correctness of solution using language tools: debug, run,	Step-wise Top-down Compiling Correctness			4H
		Editing of images, sound and music. Publishing on the web.	Design simple multimedia applications with images, sound and music Evaluate the usefulness of multimedia presentations.	Presentation software: Slide show Transition,		**Applications** Word processor Spread sheet	2H

Implementing minor projects Evaluating case study Investigating and reporting minor projects	populating a simple database Investigating reporting minor projects Using computer software applications to carry out tasks	**Using desktop publishing applications**	Design and publish simple articles using publishing software Design and insert simple graphics in articles Publishing on the web (articles, blogs,) Uploading to and downloading from the internet. (articles, images, audio & video)	Animation formatting and editing articles, images, audio, and video. Design and publish : Journals, Labels Newspapers, Invitation Business cards, Advertisement, Graphics applications: File type Image colours Line size AutoCAD	Team work Collaborative Honest and diligence Communicative Algorithmic thinking Critical thinking Creative Ethical	Presentation Publishing Autodesk Desktop Publishing photo editing Database package **Hardware** Computer s Internet connection. Project manuals **Human** Teacher Lab Assistant Technician	2H
		Using graphics application	Draw images using a graphics application such as Paint, Express, Adobe illustrator, open office draw, etc. Export or copy drawings to other applications.				2H
		Using Autodesk Applications	Using Autodesk application (Technical drawing) Export or copy drawings to other applications				2H
		Building simple databases	Using a database application to create and populate a simple database Create simple queries to demonstrate data integrity and consistency.	Table Form Query			2H
		Participating in projects	Writing Minor Project reports Investigating and reporting minor projects	Case study Project report format		Field work Project Manuals	3H

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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