# G. O. E. L Computer Educational Initiative Curriculum

## ACKNOWLEDGEMENTS

**[Adopted from Zimsec O & A'Level_Hexco Curriculum]**

This curriculum comprises of a teacher's guide for introductory courses for students undertaking a private education at the G.O.E.L Educational initiative. It covers introductory lessons on the basic components of the computer, intro to basic functions, comprehensive lessons on the applications and use of the computer across sectors, and an intensive introduction to Word processing, Spreadsheet, Database, and Presentation. And conclusively algorithm designs and programming concepts.

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## 1.0 PREAMBLE

### 1.1 Introduction

The curriculum is designed to deliver a freestyle approach to computer education meant to apply in everyday scenarios. It provides learners with a basis to advanced computer use in programming, design, coding, and computer operations and packages. The curriculum aims to equip learners with the knowledge and skill, on a broad range of computer applications in day to day life. It also thrives to arm learners with a basic understanding of how information processing systems are designed to fit practical applications and how they work. The curriculum concentrates on the principles of information and communication technology, and their applications so as to foster creativity, innovation and Technopreneurship within learners.

### 1.2 Rationale

1.2.1 for access to basic computer education

1.2.2 for the cultivation of computer skills, problem solving skills and computer literacy

1.2.3 for the basic information on effective internet use

1.2.3 for the promotion of creativity through the use of technology

### 1.3 Assumptions

1.4.1 That the subject at hand is learn-able

1.4.2 That the subject is worthy of study

1.4.3 That the subject comprises of the most important information a person should know

1.4.4 That as a result of its study and mastery, human lives will improve as a result of knowing it

1.4.5 That as a result of its study and mastery, culture and society will experience improvement, evolution and growth

### 1.4 Cross-cutting themes

1.5.1 With drug and substance abuse on the rise among the youth, the curriculum seeks to entice the youth

From the streets using its dynamic and applicable educational system.

1.5.2 With the drop in employment opportunities, the curriculum also seeks to develop the entrepreneurial mind using technological methods.

## 2.0 CURRICULUM OBJECTIVES

### 2.1    Knowledge

**Learners should be able to**

2.1.1 Describe a range of day to day applications of information processing

2.1.2 Apply information processing technology in effecting conventional data processing for individuals and organizations

2.1.3 Explain the functions of hardware and software components of information and communication systems and their interrelationship

### 2.2 Skills

**Learners should be able to**

2.2.1 Use computers sensibly to generate, implement and document everyday problems and solutions

2.2.2 demonstrate knowledge and understanding of the techniques used to solve information and communication technology problems

2.2.3 Analyses information and communication technology applications in terms of data flow and system requirements

## 3.0 AIMS

**The syllabus aims to enable learners to:**

3.1 cultivate problem solving skills through practical applications in information and communication technology

3.2 elevate computer literacy through an understanding of information processing applications and methods

3.3 gain a broad understanding of the study, as the groundwork to advanced computer science

3.4 develop an understanding in the daily use of computers so as to solve real life socio economic problems

3.5 acquire entrepreneurial skills coupled with technological skills to bring about unique work systems and solutions

## 4.0 METHODOLOGY

**Methodology**

To achieve the above stated aims and objectives the following should be implemented

- Expert presentations
- Demonstrations
- Question and Answer sessions
- Research
- Group and Individual Work
- Group Discussions

## 5.0 TIME ALLOCATION

**Time Allocation**

The subject should be allocated at least three session per week encompassing 7 hours, with at least 4 hours being devoted to theoretical work and the 3 to practical work with computer applications.

## 6.0 TOPICS

**The syllabus consists of the following topics:**

## Topic Contents:  PRESENTATION OF SYLLABUS

| Section | Section |
|---|---|
| <ul><li>**Introduction to BUILD in a box**</li><li>**48 HOUR Bootcamp**</li></ul> http://www.africanleadershipacademy.org/programs/biab/ | I |
| **Introduction to Technopreneurship** | II |
| **Introduction to Computer Hardware and Software** | III |
| **Introduction to Applications of Computers and their social and economic Impacts** | IV |
| **Introduction to Computer operations and packages** | V |
| **Introduction to algorithm design and programming concepts** | VI |
| **Project based Technopreneurship** | VII |

**Section I:** Introduction to Build in a Box

| Skills/Topic | Objectives<br><br>Learners should be able to: | Content<br><br>[Knowledge Skills, Attitudes] | Suggested learning Activities & Notes | Suggested Learning Resources |
|---|---|---|---|---|
| 5.11 | ● Introduction to BUILD in a box | ● Participant will be able to understand the BUILD model<br><br>● Participants will be able to utilize the BUILD model as a design thinking tool to create, explore solutions to address community challenges and learn how to communicate these ideas effectively | ● Discuss Design thinking methodologies towards introducing the BUILD model.<br><br>● Discuss the Business model canvas<br><br>● Discus and explore case studies in the BUILD in a Box<br><br>● Build prototype models for the ideated solutions<br><br>● Idea pitching and practise . | |

## Section 1I: Introduction to Technopreneurship

| Skills/Topic | Objectives<br><br>Learners should be able to: | Content<br><br>[Knowledge Skills, Attitudes] | Suggested learning Activities & Notes | Suggested Learning Resources |
|---|---|---|---|---|
| 5.10 Techno-Preneurship | • Defining Entrepreneurship<br><br>• Defining Techno-Preneurship<br><br><br><br>• Build perspective into components of Technopreneurship | • Explain the principles and fundamentals of entrepreneurship<br><br>• Explore the interdisciplinary relationship of Technology and entrepreneurship<br><br>• Explore the benefits of entrepreneurial thinking<br><br>• Environmental Technopreneurship component<br><br>• Science parks<br><br>• Incubation centers<br><br>• Academic institutions<br><br>• Research and development centers | • Discuss Entrepreneurship from a broad perspective<br><br>• Identifying principles of entrepreneurship<br><br>• Groups attempt to tie Entrepreneurship to techno-Preneurship and possible example identifications<br><br><br><br>• Discussing the uses of Technopreneurship components | |

**Section III:** Introduction to Computer Hardware and Software

| Skills/Topic | Objectives<br><br>Learners should be able to: | Content<br><br>[Knowledge Skills, Attitudes] | Suggested learning Activities & Notes | Suggested Learning Resources |
|---|---|---|---|---|
| **6.10 Hardware and Software** | • Identify Hardware devices<br><br>• Setup Hardware devices<br><br>• Identify software | • Input devices<br><br>• Output devices<br><br>• Storage Devices<br><br>• Processing devices<br><br>• Software concepts | • Demonstrate the use of hardware devices<br><br>• Identify different software<br><br>• Discussing the function of an OS | • PC and Laptops<br><br>• Printers<br><br>• Online Tutorials |
| **6.11 Hardware and Software** | • Identify Application of Software<br><br>• Use utility software and tools | • Application Software<br><br>• Off-shelf software<br><br>• Customized software<br><br>• Open source software<br><br>• System software utility tools | • types of application software<br><br>• Classifying application software<br><br>• Performing system | • OS- I.e. Linux, Windows, Mac Os<br><br>• System utility tools such as Tune-up, Disk Fragmentizer |
| **6.12 Hardware and Software** | • Identify various applications of hardware<br><br>• Compare different | • Hardware devices<br><br>• Applications of Hardware devices i.e. Post. ATM, DTA | • Demonstrating the use of hardware devices | • Operating systems such as Linux, Windows, |

| | OS | Capturing systems | ● Identify different OS | Android |
|---|---|---|---|---|
| | ● Explain the functions of OS | ● O_S<br>● PC operating system<br>● Mobile OS i.e. | ● Discussing the functions of an OS | ● Mobile phones |
| **6.13 Hardware and Software** | ● Replace malfunctioning components<br>● Troubleshoot and Fix common software and hardware problems | ● Hardware and software maintenance<br>● Common errors<br>● Software<br>● Keyboard<br>● Mouse<br>● Hard drive<br>● Memory | ● Maintaining hardware and software<br>● Building a functional PC | ● Hardware components<br>● Software tool kit<br>● Repair toolkit<br>● Internet<br>● Online tutorials |

**Section IV:** Introduction to Applications of Computers and their social and economic Impacts

| Skills/Topic | Objectives<br><br>Learners should be able to: | Content<br><br>[Knowledge Skills, Attitudes] | Suggested learning Activities & Notes |
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| **7.10 Applications of Computer science** | ● Describe areas of computer applications | ● Agriculture<br>● Banking Systems<br>● Education<br>● Social Networks<br>● Research and Development | ● Distinguish different computer applications<br><br>● Educational tours to technology centers |

| 7.11 The range and scope of computer applications<br><br>● **General applications** | ● Identify general applications using examples<br><br>● Explain a variety of computer applications<br><br>● State purposes, requirements, designs of the applications | ● Communication and Information systems<br><br>   ❏ VoIP<br>   ❏ Fax<br>   ❏ Email<br>   ❏ E-conferencing<br>   ❏ Database systems<br>   ❏ Social networks<br>   ❏ Other internet services<br><br>Commercial and general data processing<br><br>● E-Banking<br>● POS<br>● Stock Control<br>● E-Commerce<br>● Record management systems<br><br>Industrial, technical and scientific Uses<br><br>● Weather forecasting<br>● CAD/CAM<br>● Simulation and modeling i.e. Flight simulation<br>● Image processing I.e. GPRs<br><br>Monitoring and control | ● Research and reporting on general application areas of computers<br><br>● Discussing a variety of computer applications<br><br>● Conducting field trips to identify general computer application areas |

| | | systems | |
|---|---|---|---|
| | | • Traffic control<br>• Nuclear power stations<br>• Patient monitoring<br><br>Expert systems and artificial intelligence<br>• Mineral prospecting<br>• Medical diagnosis<br>• Speech recognition<br><br>Entertainment, Education, and training<br>• E-Learning<br>• E-Marking<br>• E-Registration<br>• Multimedia systems<br>• Animation and film | |
| **7.12 Social & Economic implications of the uses of computers** | • Determine the social and economic implications of the use of computers on people and organizations<br><br>• Highlight the advantages and disadvantages of the use of computers across a range of application areas<br><br>• Justify the need for Data integrity and security | Economic and social implications of the use of computers<br><br>Privacy and data integrity<br>• Reliability<br>• Security<br>• Computer crime_Hacking_Viruses<br>• Data protection legislation | • Researching on the social and economic implications of the use of computers on people and organizations<br><br>• Identifying new products and services brought by the use of computers<br><br>• Discussing the effects of the use of computers across a range of application areas |

| | | Computer ethics | |
| | | | |
| | | Advantages and disadvantages of the use of computers across a range of application areas | • Investigating changes in employment and retraining |
| | | | • Debating on the need for privacy and data integrity |
| | | | • Discussing security measures |

## Section V: Introduction to Computer operations and packages

| Skills/Topic | Objectives<br><br>Learners should be able to: | Content<br><br>[Knowledge Skills, Attitudes] | Suggested learning Activities & Notes |
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| **8.1MS_Word**<br><br>**Introduction to Word** | • Explain the features of word processor<br><br>• State the disadvantages and advantages of a word processor<br><br>• List processor examples | ❏ Word processor<br>❏ Word processor features<br>❏ Word wrap<br>❏ Widow /orphan<br>❏ Soft return/hard return<br>❏ Pagination<br>❏ Hard space/ loft space | • Describing the word processor environment<br><br>• Listing advantages and disadvantages of word processors<br>• Identify uses of word processors |

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| | | ❏ Drop cap<br>❏ Word processor exam[les | ● Typing text which encompasses all letters on the keyboard |
| **Document creation** | Use keyboard and<br>mouse<br><br>❏ Type documents<br><br>❏ Save documents<br><br>❏     documents | Keyboard and mouse<br><br>❏ Typing procedures<br><br>❏ Saving procedures<br><br>❏ Retrieving procedures | ● Identifying keyboard keys and their functions<br><br>● discussing keyboard use<br><br>● Opening documents<br>● Saving documents |
| **Text Formatting** | Format text | Text formats<br><br>❏ Bold<br><br>❏ Italic<br><br>❏ Underline<br><br>❏ Subscript<br><br>❏ Superscript<br><br>❏ Borders<br><br>❏ Changing text color<br><br>❏ Font size changing<br><br>❏ Font type changing | ● Discussing text formatting procedures<br><br>● Typing a short paragraph and text |
| **Paragraph** | Format paragraphs | Paragraph<br>Justification<br><br>❏ Line spacing<br><br>❏ Drop cap<br><br>❏ Indentation<br><br>❏ Columns<br><br>❏ Tabulation | ● Explaining the concepts of paragraph formatting<br><br>● Discussing areas of application of various paragraph formats<br><br>● Typing and effecting |

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| | | ❏ Bullets and numbering | paragraph formatting |
| **Page formatting** | Format document pages | ❏ Page formats<br>❏ Page layout<br>❏ Water marks<br>❏ Headers and footers<br>❏ Page numbering and styles<br>❏ Boarders | ● Discussing formats and formatting procedures<br><br>● Performing pages formats |
| **Document Inserts** | Insert objects into a document<br>❏ Insert objects<br>❏ Format objects<br>❏ Export and import objects | Document inserts<br>❏ Table<br>❏ Pictures<br>❏ Charts<br>❏ Word art<br>❏ Symbols<br>❏ Clip art<br>❏ Equations<br>❏ files | ● Discussing procedures of insertions<br><br>● Practicing inserting objects<br><br>● Formatting objects |
| **Document editing** | ● Using spelling and grammar checks<br><br>● Search and replace text<br><br>● Move text<br><br>● Delete text blocks | ❏ Copy and paste<br>❏ Moving texts<br>❏ Cut and paste<br>❏ Drag and drop<br>❏ Delete<br>❏ Find and replace<br>❏ Spelling and grammar | ● Moving text<br>● Copying and pasting<br>● Cutting and pasting<br>● Locating and replacing text<br>● Using spelling and grammar check facility |
| **Printing** | Print documents | Print dialogue box | ● Opening print dialogue box |

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| | | | ● Discussing print dialogue box options<br><br>● Producing print outs |
| **Mail merge** | ● Create documents using mail merge<br><br>● Explain situations where mail merge is used. | ❏ Mail merge<br>❏ Mail merge applications<br>❏ Mail merge procedure<br>❏ Form letters<br>❏ Data sources<br>❏ Fields<br>❏ merging | ● Discussing use of mail merge<br><br>● Explaining mail merge procedures<br><br>● Demonstrating mail merge process<br><br>● Creating mail merge documents<br><br>● Printing merged documents |
| **8.20 Spreadsheet**<br><br>**Introduction to spreadsheet** | ● Describe the spreadsheet package<br><br>● List the advantages and disadvantages of spreadsheets | ● Spreadsheet environment<br><br>● Spreadsheet<br><br>   I.e. MS excel<br><br>   Lotus 1-2-3 | ● Discussing the spreadsheet environment<br><br>● Stating the advantages and disadvantages of a spreadsheet<br><br>● Identifying the uses of spreadsheets |
| **8.21**<br><br>**Worksheet creation** | ● Create a worksheet | ❏ Data entry<br>❏ Values<br>❏ Labels<br>❏ Formulas | ● Entering labels<br>● Entering values<br>● Referencing data in a spreadsheet<br>● Saving a worksheet |

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| | | ❑ Cell<br><br>❑ Saving and retrieving<br><br>❑ Formula steps<br><br>❑ User-defined<br><br>❑ Functions<br><br>❑ logical | |
| **8.22**<br><br>**Formulae application** | ● Create formulae<br><br>● Apply formulae<br><br>● Predict formulae outcome<br><br>● Copy formulae | ● Formulae copying methods<br><br>● Dragging<br><br>● Copy and paste<br><br>● fill | ● Explaining the nature of formulae<br><br>● Entering formulae using an auto sum of Fix Functions<br><br>● Copying formulae using methods such as dragging<br><br>● Interpreting formulae |
| **8.23**<br><br>**worksheet** | ● Format worksheet | ● Data formatting<br><br>● Labels and values<br><br>● Currency format<br><br>● Decimal format<br><br>● Font size<br><br>Font types<br><br>Borders and shading | ● Changing appearances of data in a worksheet<br><br>● Displaying data in currency and decimal format<br><br>● Applying border and shading to data and worksheet |
| **8.24** | ● Edit worksheet | ❑ Row and columns | ● Inserting rows and columns |

| Editing a worksheet | | ❏ Data <br> ❏ Worksheet <br> ❏ Text <br> ❏ panes | ● Deleting rows and columns <br><br> ● Adjust rows and column <br><br> ● Naming worksheets <br><br> ● Changing worksheet values <br><br> ● Freezing panes |
|---|---|---|---|
| **8.25** <br> **Graphs and charts** | ● Represent data using graphs and charts <br><br> ● Import and export graphs and charts | ● Data selection <br> ● Bar charts <br> ● Column charts <br> ● Line graphs <br> ● Pie charts <br> ● Graph formatting <br> ● Import and export <br>    ❏ Data <br>    ❏ Graphs | ● Creating different charts and graphs using a set of data <br><br> ● Importing and exporting graphs, charts, and data <br><br> ● Labeling graphs and charts <br><br> ● Printing worksheets graphs and charts |
| **8.3** <br> **Databases** <br> **Intro to databases** | ● Define the concept of a database <br><br> ● list the advantages and disadvantages of databases | ● Database, field, record, file <br><br> ● Database examples | ● describing database concepts and using specific database packages such as MS Access <br><br> ● Listing the advantages and disadvantages of |

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| | | ❏ MS access<br>❏ Lotus approach<br>❏ Oracle<br>● Uses of databases | databases |
| **8.31**<br><br>**File Structure** | ● create a file structure | ❏ Fields<br>❏ data types<br>❏ field size<br>❏ data formats<br><br>validation rules and input<br><br>❏ Masks<br>❏ tables | ● Explaining file suture<br><br>● Opening a database program<br>● Creating a database<br>● signing database files<br>● Setting fields, data<br><br>l)Pes, fonts, field sizes, validate'>n checks and input masks |
| **8.32**<br><br>**Objects** | ● design forms, reports and queries | ● Forms<br>● Reports<br>● Types of queries<br>● delete Select | ● Creating forms<br>● signing queries<br>● Running queries<br>● Signing reports |
| **8.33 Data manipulation** | ● Manipulate records | ● Records<br>  ❏ add<br>  ❏ delete<br>  ❏ edit<br>  ❏ search and filler<br>  ❏ sort<br>  ❏ print | ● Adding records<br>● Deleting records<br>● Editing records<br>● Searching and filtering records<br>● Sorting records<br>● Printing records |

| 8.40 Presentation introduction to presentation | ● describe the features of a presentation package<br><br>● list advantages and disadvantages of presentation packages | ● Presentation Package environment<br><br>● Presentation packages<br>❏ MS PowerPoint<br>❏ freelance graphics | ● Explaining Presentation environment<br><br>● Discussing the advantages and disadvantages of presentation packages<br><br>● Discussing uses of presentation packages |
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| **8.41**<br>**Presentation authoring creation** | ● design slides<br>● add animation<br>● show slide | ● Features of presentation<br>❏ slides<br>❏ Charts<br>❏ presenter notes<br>❏ images<br>❏ slide transitions<br>❏ animation effects | ● Explaining Slide design procedures<br>● Opening a presentation program<br>● Designing slides<br>● Inserting. Arts and images<br>● Entering presenter notes<br>● Creating organograms<br>● Applying slide transitions and animations<br>● Saving slides<br>● Relieving Slides<br>● Demonstrating presentations<br>● Printing presentations |

**Section VI: Introduction** to algorithm designs and programming concepts

| Skills/Topic | Objectives<br><br>Learners should be able to: | Content<br><br>[Knowledge Skills, Attitudes] | Suggested learning Activities &Notes |
|---|---|---|---|
| **9.10**<br>**Standard algorithms** | Describe algorithms using<br><br>pseudo codes and<br><br>Flowcharts<br><br>Apply searching and<br><br>sorting to solve problems | ● Algorithm: structures<br>   ❏ selection<br>   ❏ repetition/iteration<br>   ❏ recursion<br>   ❏ linear<br>● Sorting algorithms<br>   ❏ bubble sort<br>   ❏ quicksort<br>● Searching algorithms<br>   ❏ linear<br>   ❏ binary search | ● Designing algorithms using pseudocodes and flowcharts<br><br><br>● Solving searching and sorting problems |
| **9.11 System design** | Compare top-down and | ● System design approaches | ● Discussing top-down and bottom-up approaches to |

| approaches | bottom-up approaches to program design | ❏ top-down design<br><br>❏ bottom-up description | program design<br><br>● Demonstrating the use of top-down and bottom-up approaches to program design |
|---|---|---|---|
| **9.12 Programming languages** | ● Explain the features of programming languages<br><br>● describe the features of low 1evell 1anguages<br><br>● describe the features of high-level languages<br><br>● compare high level and lo\v level languages | ● Language features<br>❏ programming constructs<br>❏ Constants<br>❏ Variables<br>❏ Expressions<br>❏ statements<br>❏ control structure<br>❏ block structure<br>❏ Variables<br>    ❏ Local<br>    ❏ global<br>❏ functions and procedures<br>❏ parameter passing<br>    ❏ by value<br>    ❏ by reference<br>● input, output and file handling operations<br>● Programming languages<br>❏ High-Level language (HLL)<br>❏ Low-Level language | ● Discussing the features of programming language<br><br>● Describing characteristics or features of high-level languages and their proper use<br><br>● Analyzing high level and low-level languages |

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| | | (LLL) | |
| | | ● LLL types<br>❏ machine language<br>❏ assembly language | |
| | | ● HLL types<br>❏ imperative/procedural<br>❏ Declarative | |
| | | ● general purpose<br>❏ special purpose<br>Object-Oriented Programming (OOP) | |
| **9.13**<br>**Visual Basic programming**<br>VB (6.0 or .net) | ● define basic VB programming technics<br><br>● identify data types<br><br><br><br><br><br>● declare variables | ● The basic structure of a VB program<br>● Data types in VB<br>❏ integer<br>❏ real<br>❏ character<br>❏ string<br>❏ word<br>❏ Boolean | ● Discussing basic VB programming terms<br><br>● Explaining data types<br><br><br>● Declaring variables correctly as they apply to VB programming<br>● Choosing correct |

| | | | identifier names |
|---|---|---|---|
| | ● use operators and VB syntax correctly | ● Variables<br>● constants<br>● Syntax<br>❏ statements<br>❏ expressions<br>● Operators | ● Using correct operators and VB syntax |
| | | ❏ arithmetic | ● Designing VB interfaces using VB controls |
| | ● explain the scope of a variable | ❏ Logical<br>❏ assignment<br>❏ comparison | ● Discussing the scope of variables |
| | ● code simple VB programs | | ● Coding VB programs such as simple arithmetic problems: addition, subtraction, division, and multiplication of two or more variables, use of contro1 structures |
| | | ● Variable scope<br>❏ global<br>❏ local | ● Programs_ that calculate ( Area. roots of a quadratic equation and grading of marks ) |
| | | ● VB control interfaces textbox<br>❏ command button<br>❏ checkbox<br>❏ option button<br>❏ list box | Running a VB code<br><br>Dry run a VB code |
| | | ● Control structures<br>❏ sequence<br>❏ repetition<br>❏ Do...While | Applying error handling techniques in the VB program<br><br>Debugging in programs |

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| | | ❏ For...Next<br>❏ Do... Until | BB: Annotate statement and correct indentation |
| | ● Develop a CB code<br>● Identify types of errors<br>● Apply error handling techniques in a VB program<br>● Debug errors in programs | ● Selection/decision<br>❏   case<br>❏ Else if<br>❏ Case... of<br>❏ If… then... else<br>❏ Cascaded / Nested if<br><br>● Errors in VB<br>❏ Types of errors<br>      ❏ Syntax<br>      ❏ Logical<br>      ❏ Runtime<br>● Error handling techniques<br>Try catch as an exception | |

**Section VII:** Introduction to Technopreneurship

| Skills/Topic | Objectives<br><br>Learners should be able to: | Content<br><br>[Knowledge Skills, Attitudes] | Suggested learning Activities &Notes | Suggested Learning Resources |
|---|---|---|---|---|
| 10.10  Techno-Preneurship | ● Defining Entrepreneurship<br><br>● Defining Techno-Preneurship | ● Explain the principles and fundamentals of entrepreneurship<br><br>● Explore the interdisciplinary relationship of Technology and entrepreneurship<br><br>● Explore the benefits of entrepreneurial thinking | ● Discuss Entrepreneurship from a broad perspective<br><br>● Identifying principles of entrepreneurship<br><br>● Groups attempt to tie Entrepreneurship to techno-Preneurship and possible example identifications | |
| 10.11 Techno-Preneurship | ● describe the Technopreneurship components | ● Environmental Technopreneurship componet<br><br>❏  Science parks<br><br>❏  Incubation centers<br><br>❏  Academic institutions | ● Discussing the uses of Technopreneurship components<br><br>● Attending to ICT Exhibition Expos | |

| | | ❏   Research and development centers | | |
|---|---|---|---|---|
| 10.12 Techno-Preneurship | Intro to the business aspect<br><br>● describe the elements of intellectual capital<br><br>● explain the attributes of business ethics<br><br>● identify the marketing and business strategies element<br><br>● explain the elements of marketing and business | ●  Elements of Intellectual capital<br>❏  Human capital<br>❏  Organization capital<br>❏  Social capital<br><br>●  Business ethics (Unhu/Ubuntu/<br>Vumunhu)<br><br>●  Marketing and business strategies<br>❏  e-commerce | ● Discussing the elements of Intellectual Capital<br><br>● Discussing the attributes of business ethics<br><br>● Creating an ICT based business plan<br><br>●  Discussing the elements of marketing | ●  Internet<br><br>● Print and electronic media such as journals<br><br>● Case study<br><br>● CZI |
| 10.13 Techno-Preneurship | ● outline financial resource components<br><br>●  identify ideal conditions for the business location | ●  Finance and funding<br><br>●  Market research | ● Discussing finance and funding opportunities<br><br>● Discussing ideal conditions for the business location<br><br>● Conducting market surveys | ● Print and Electronic media<br><br>● ICT Tools |

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| 10.14<br><br>Techno-Preneurship | ● identify laws that govern Technopreneurship<br><br>● describe the intellectual property rights | ● Laws and policies on Technopreneurship<br><br>● Intellectual Property Rights<br><br>❏ Patents<br>❏ Copyrights | ● Discussing the laws and policies of Technopreneurship<br><br>● Describing the intellectual property rights | ● Internet<br><br>● Electronic and print media<br><br>● Expert Guests |
| 10.15<br><br>Techno-Preneurship | Project-based Learning | | ● Introduction to BUILD in a box<br>● 48 HOUR Bootcamp<br><br>http://www.africanleadershipacademy.org/programs/biab/ | |