NCDC
NATIONAL CURRICULUM DEVELOPMENT CENTRE

# NATIONAL CERTIFICATE IN INFORMATION AND COMMUNICATION TECHNOLOGY

# NCICT

## Teaching Syllabus


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NATIONAL CURRICULUM DEVELOPMENT CENTRE

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# Contents

# Foreword

Government of Uganda through the National Curriculum Development Centre, under the Ministry of Education and Sports embarked on reviewing the Business, Technical and Vocational curricula to make it competence based as advocated for by the BTVET Strategic Plan (2011 – 2020) of "Skilling Uganda". Government emphasis has been placed on provision of knowledge, skills and work attitudes for majority of Ugandans with a view of improving service delivery and increasing productivity of citizens.

To ensure quality and standards across the country, the Ministry through National Curriculum Development Centre (NCDC) in partnership with the various institutions that had developed individual curricula took up the responsibility of harmonizing the curricula materials for all institutions both private and public. Government further streamlined the post Ordinary level programmes to run for two years, with the aim of equating such qualifications to the Advanced Certificate of Education and to allow for progression, and in accordance with the recommendations of the Government White Paper (1992).

The harmonization of this curriculum was premised on the current labour market demands, making it learner centered, and competence based. It focuses on core tasks and continuous assessment, with each semester involving execution of a real life project that makes the graduate competent in the field of work.

The current environment is very dynamic and creates a lot of challenges for the learners. Therefore the National Certificate in Information and Communication Technology (NCIT) programme is aimed at equipping learners with skills in software management, hardware management, network management and
office administration. It will guide them on how to deal with problems which can greatly impact on the day-to-day operations of business.

As Minister responsible for Education I urge both public and private Business, Technical, Vocational and other tertiary institutions charged with a duty of training in the country, to embrace this programme.

**Hon. Janet Kataaha Museveni**
First Lady and Minister for Education and Sports

# Acknowledgement

National Curriculum Development Centre (NCDC) extends its appreciation to all panel members and institutions that participated in developing this curriculum.

NCDC recognises the Uganda Business and Technical Examinations Board (UBTEB) for their financial and technical contributions.

The Centre further acknowledges the different institutions that directly composed the panel members for developing this curriculum. These include; Uganda Colleges of Commerce, industries, and the private institutions under the UGAPRIVI umbrella.

Finally we would like to appreciate the Ministry of Education and Sports, particularly the BTVET department for the continuous support and guidance given to the Centre in fulfilling our mandate.

**Grace K. Baguma**
Director
National Curriculum Development Centre

# Acronyms

| | |
|---|---|
| BTVET | Business Technical and Vocational Education and Training |
| CBET | Competence Based Education and Training |
| CGPA | Cumulative Grade Point Average |
| CH | Contact Hours |
| CSS | Cascading Style Sheets |
| CU | Credit Units |
| GP | Grade Point |
| HTML | Hyper Text Markup Language |
| LAN | Local Area Network |
| LH | Lecture Hours |
| MoES | Ministry of Education and Sports |
| NCDC | National Curriculum Development Centre |
| NCIT | National Certificate in Information and Communication Technology |
| PH | Practical Hours |
| RJ45 | Registered Jack 45 |
| UBTEB | Uganda Business and Technical Examinations Board |
| UCE | Uganda Certificate of Education |
| URL | Uniform Resource Locator |
| WAN | Wide Area Network |
| WoW | World of Work |
| WWW | World Wide Web |

# Introduction

With jobs being scarce, the information technology industry continues to show a promising demand trend. However, with the changing needs of society and technology advancement, ICT technicians need to be equipped with modern knowledge, skills and attitude in order to competently fit in the ever changing labour market. This need called for the review of the NCIT curriculum to make it competence based and also input content that addresses the contemporary needs of the labour market.

This curriculum will equip learners with the currently required knowledge and skills in information technology and give them advantage to take on a lot of opportunities and jobs that include;

a) typesetting documents.
b) managing computer repair workshops.
c) support in setting up, configuring and troubleshooting a Local Area Network (LAN).
d) web designing and performing computer graphics.

This curriculum is in line with the BTVET Act of (2008), the BTVET Strategic Plan 2011 – 2020 of "Skilling Uganda'' and the Uganda Vision 2040. The modules offered in this programme are packaged in a manner that will enable the learner to attain particular skills required for performing tasks required in the world of work. The competences that the learner is expected to acquire are clearly spelt out in the modules covered in each of the two semesters of an academic year.

Modules such as Fundamentals of Information Technology; Basic Kiswahili; Basic Communication Skills, are aimed at enhancing the learner's communication, report writing, and presentation skills.

While modules like Microsoft Office Applications, Computer Ethics, HTML Web programming, Computer Graphics and Photo Editing, Web site Development, Electronic Communication and Networks, Basic Computer Maintenance, will enable the learner to demonstrate core ICT skills.

Industrial Training which is done at the end of each academic year is aimed at bridging the gap between institutional-based training and the world of work.

This curriculum includes a professional profile, which was developed as an amalgamation of the various tasks from which modules have been formed.

The skills to be acquired will enhance the learners' confidence and ability to participate effectively in income generating activities, not only as members of the business world, but also as creative citizens dealing with issues emanating from the works that impact on other people's lives.

# General Guidelines and Regulations

## Programme Title

The programme shall be called National Certificate in Information and Communication Technology (NCIT)

## Duration of the Programme

The National Certificate Information and Communication Technology (NCIT) is a full time programme taught in two academic years.

Each academic year will be divided into two semesters. Semester one and two will consist of seventeen (17) weeks, comprising of fifteen (15) weeks of teaching/learning and continuous assessment and two (2) weeks of practical and written examinations.

In case of any challenge, the programme should be completed within a time frame of **five** years from the time of enrolment and registration.

## Admission/Entry Requirements

A candidate shall be eligible for admission to the National Certificate in Information and Communication Technology (NCIT) programme on meeting any of the following minimum qualifications:

**a) Ordinary Level Entry Scheme (Uganda Certificate of Education entry scheme)**

The candidate should be a holder of a Uganda Certificate of Education Education (UCE) with at least three passes obtained in the same year of sitting.

**b) Certificate Entry Scheme**

The candidate should hold a Junior Vocational Certificate (JVC) OR Community Polytechnic Certificate (CPC), obtained from any recognised institution.

## Curriculum Implementation

The curriculum for National Certificate in Information and Communication Technology (NCIT) is based on a modular system. During the training, continuous assessment shall be carried out as a CBET requirement. This shall start with preparatory assignments that prepare the learner for the programme relating it to the core tasks. Each module contains sub-

modules that will help the learner to understand how to perform the core tasks through:

- Applied knowledge
- Practical involvement
- Professional attitude

The learner will also have to carry out a real life project to put into practice the knowledge and competences acquired in class.

## Prospects for National Certificate in Information and Communication Technology

NCIT graduates may opt to further their education and improve on their skills by offering a diploma and or degree in Information Technology or any other vocational program of one's choice.

### Assessment Criteria

Each module shall be assessed out of 100 marks as follows:

| | |
|---|---|
| Continuous assessments | 40% |
| Final examinations | 60% |

### Continuous Aassessments

These shall be either individual based or group assignments. They will consist of:

- Practical work
- Classroom exercises and presentations
- Assignments
- Tests
- Industrial Training and projects execution

There shall be final examinations within the last two weeks of every year set and conducted by UBTEB.

A candidate shall be considered to have acquired a competence on performing tasks required in the labour market. One must have attended at least 75% of the module and undergone both continuous assessment and end of year examinations.

Continuous assessment shall be handled by the training institutions and verified by UBTEB officials.

## Project Work

This involves a combination of subjects' knowledge, process skills and transferable abilities. Learners have to apply classroom knowledge and skills proactively in a real-life context for an extended period of time. Each learner will be required to run a real life project outside classroom time. At the end of every academic year a learner should have a visible real life project on the ground to be authenticated by UBTEB.

Project work shall be assessed continuously by the teachers and marked out of 100% just like other modules. This shall be based on both the final product and the process involved in making it. A team of examiners from UBTEB shall move around to assess the implementation, authenticity, and progression of the projects.

**The following guidelines may be considered for project assessment:**

| | |
|---|---|
| Innovation and creativity | 10 marks |
| Customer care | 10 marks |
| Neatness | 10 marks |
| Record keeping | 10 marks |
| Health and safety observation | 10 marks |
| Actual performance | 20 marks |
| Final product | 20 marks |
| Project report | 10 marks |
| **TOTAL** | **100 marks** |

**Industrial Training**

Every learner must get placement for Industrial Training to be done at the end of each academic year. Industrial Training shall be assessed out of 100% as a full module considering the following areas:

| | |
|---|---|
| Attendance | 05 marks |
| Time management | 05 marks |
| Teamwork | 05marks |
| Creativity and innovativeness | 15 marks |
| Customer care | 10 marks |
| Health and safety | 15 marks |
| Actual performance | 25 marks |
| Written report | 20 marks |

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**TOTAL 100% marks**

Samples of assessment forms for the academic and the field supervisors are provided in the appendices.

UBTEB shall verify the authenticity of the Industrial Training marks awarded by the two supervisors by sending their representatives to visit the trainees at the organisations where they will be placed and working.

## Awards

A learner who completes the programme with at least 2.0 Cumulative Grade Point Average (CGPA) in each of the modules shall be awarded a classified **''National Certificate in Information and Communication Technology** by Uganda Business and Technical Examinations Board (UBTEB).

A learner who completes the programme and does not attain at least 2.0 (GPA) in some modules shall be awarded a **''Competence Certificate**" by UBTEB for the modules passed. The Competence Certificate shall enable the learner to have specialised upgrading and employment since he/she will have attained useful competences and skills in the specialised field.

On completion of year 1, a learner will be entitled to a statement of results by the examining body indicating the grades obtained in each module.

## Module Credits and the Weighting System

1. Each module will be weighed using the credit units (CU).
2. One credit unit is equivalent to 15 contact hours (CH) per semester.
3. A contact hour can either be a teaching/lecture hour (LH), tutorial hour (TH), field visit hour (FVH) or practical hour (PH).
4. One contact hour is equivalent to 1 classroom teaching hour, 2 tutorial hours or 2 practical /field visits hours.
5. Modules are weighed according to credit units (CU) ranging from a minimum of 2.0 to a maximum of 5.0 based on their core relevancy in the area of specialization.

Hence a module weighed 2 CU will take 30 contact hours, 3 CU will take 45 contact hours, 4 CU for 60 contact hours, and 5 CU for 75 contact hours.

No credit unit shall be awarded to any module in which a learner obtains less than 2.0 grade points.

## Grading of Modules

Each module shall be graded out of 100 marks and assigned an appropriate letter grade and grade points as follows:

| MARKS (%) | LETTER GRADE | GRADE POINTS |
|---|---|---|
| 80-100 | A | 5.0 |
| 75-79 | $B^+$ | 4.5 |
| 70-74 | B | 4.0 |
| 65-69 | C+ | 3.5 |
| 60-64 | C | 3.0 |
| 55-59 | D+ | 2.5 |
| 50-54 | D | 2.0 |
| 0 – 49 | F | 0 |

## Cumulative Grade Point Average (CGPA)

The grading of NCIT awarded to a learner shall be done according to the Cumulative Grade Point Average (CGPA) score. The final marks for the modules shall be converted into Grade Points (GP).

## Computation of the CGPA

The learner's CGPA at a given time shall be obtained by:

1. Multiplying the grade points obtained in each module by the corresponding credit units assigned to the module to arrive at the weighted score for that module.
2. Adding together the weighted scores for all modules up to that time
3. Dividing the total weighted scores by the total number of credit units taken up to that time.

## Classification of the Certificates

The National Certificate in Information and Communication Technology (NCIT) shall be classified according to the CGPA obtained up to the end of the programme. The certificates shall be classified as follows:

| Class | CGPA |
|---|---|
| Distinction | 4.30 – 5.00 |
| Credit | 2.80 – 4.29 |
| Pass | 2.00 – 2.79 |

## Retaking a Module

Retaking will require a learner to redo the entire module by attending lectures, doing continuous assessment, and sitting the final examinations of that module. There shall be no supplementary examination or tests set for any retake but a learner will re-do the paper when the module is next examined.

A learner may also retake a module to improve the grades obtained at the first sitting. Should the learner get a lower grade for a retake, his/her original grade should prevail.

A learner should be allowed a maximum of three retakes for a module.

Whenever a module is retaken and passed, the academic transcript should **not** indicate so.

## Dead Year

A learner shall be allowed to apply for a dead year of study due to financial constraints, sickness or other genuine problem and should be allowed to resume the programme at the level he/she exited for the dead year. A

learner who applies for a dead year shall also have to complete the programme within duration of five (5) years from the time of enrolment and registration into the programme.

## Academic Year Load

A learner shall carry a maximum of 25 Credit Units per semester.

Each academic year shall contain a maximum of eight modules/assessment units including project work.

## Methodology

The teaching/learning methods in this curriculum are just a sample. It is at the teacher's discretion to apply any other method deemed suitable to the classroom setting. The type of method selected should be guided by the competences to be acquired by the learner. The teacher is encouraged to use a variety of method in a lesson to make it more interesting and practical.

Examples of some of the teaching/learning methods include:

**1. Discussion**

**a) Group Discussion**

Learners discuss issues in groups. This method enables knowledge/information to come from the learners rather than from you. It promotes teamwork and allows all learners to have an opportunity to give their opinions and ideas; and also stimulates their interest as they learn from each other.

**Guidelines for using group discussion method**

i) Group learners.

ii) Give clear instructions to learners as to what each group should do.

iii) Assign task(s) to each group.

iv) Learners discuss issues raised in the task with your guidance.

v) Learners agree on the issues to be presented.

vi) Learners make group presentations and general discussions

vii) Summarize agreed class points.

b) **Guided Discussions**

**Guidelines for using guided discussion method:**

i) Lead the discussion and act as the chairperson/secretary.

ii) Give clear instructions to learners as to what they should do.

iii) Learners discuss issues raised in the task with your guidance.

iv) Learners agree on the issues.

v) Summarize the session by drawing on the main points.

**2. Case Study**

This is where you give learners information about a situation for them to come up with decisions or solutions to a problem. The purpose of case studies is to:

i) Help learners to identify and solve problems in a typical situation.

ii) Provide learners with confidence in decision making.

iii) Help learners develop analytical skills.

**3. Brainstorming**

This is a way of obtaining as many views as possible from the learners in a short time. The learners should be guided to give as many ideas as they can, on a particular issue. It is recommended that all ideas are accepted without questioning. The ideas should be ranked according to the relevancy to the issue being brainstormed.

**Basic rules for brainstorming**

i) Encourage as many ideas as possible.

ii) Encourage positive criticism.

**4. Buzz Method**

This is a method of training that requires learners seated near each other to discuss an issue that could have a lot of points or controversy to be agreed upon. The noise is the murmur that the class makes like that of buzz. Therefore some manageable noise or murmur should not be mistaken for no learning. This method is good in situations where one cannot conduct effective training like when it is raining.

Ask questions about what learners have discussed to find out if they have understood.

**5. Guided Discovery**

This method is based on the notion that the learners know more than they think they know. The assumption is that they only need to be prompted to discover this knowledge for themselves. Your role is to organise the learning environment and present the content in such a way that the learners can discover more knowledge and ideas.

**6. Demonstration**

This is the act of exhibiting, describing, and explaining the operation or process by use of a device, machine, process or product to learners. A demonstration can be carried out by you or the learners.

**7. Illustration**

This is a depiction or representation of a subject matter, such as a drawing, sketch, painting, photograph, or other kind of image of things seen, remembered or imagined, using a graphical representation. This method is best used where words are not sufficient to clearly bring out a concept. It gives a visual impression to what is being taught.

**8. Guest Speaker**

Guest speakers could be local entrepreneurs, government officials, professional practitioners or community leaders invited to make a presentation to learners. Guest speakers can provide a variety to the entrepreneurship education learning, share experience, add value by engaging learners in an educational or informative manner. The method provides learners with an opportunity to physically interact with a practitioner and motivates them to develop an entrepreneurial attitude.

**9. Role-Play**

This method is where learners are presented with a situation they are expected to explore by acting out the roles of those represented in this situation. You should carefully select and prepare properly the role-play learners for their roles. Equally prepare the remaining learners for the role-play by briefing them on how they are to act during the presentation. The players should try to behave naturally during the presentation.

You should:

i) observe when the presentation is taking place.

ii) guide learners in the programme of presentation to ensure that they focus on the theme of the play.

iii) engage learners in a discussion or ask them questions about what they have learnt from the role play with a view of finding out if the role play has provided sufficient information.

**10. Study Tour**

This is when learners are taken out to perform particular tasks with the aim of carrying out an observation, practice or witness the flow of events. It enables the learners to link the school situation with the reality in the community or world of work.

**11. Field Attachment**

This is when learners are attached to some entrepreneur(s) to practice during their study time. It does not only enable them to relate what they have learnt in classroom but also allows them to acquire more knowledge and skills beyond what was covered. It further motivates learners to become practitioners or entrepreneurs.

## Final Paper Examinations Format

### Year 1 Semester 1 Examinations Format

| Paper Name and Code | Examination Format |
|---|---|
| NCIT111: Fundamentals of Information Technology<br><br>BCCS 112: Basic Communication Skills<br><br>NCIT113: Basic Mathematics | Each paper shall consist of **eight** questions and the candidate is required to answer any **five. All** questions carry **equal** marks.<br><br>The questioning techniques to be applied should seek the candidate's ability to remember, comprehend, apply, analyse, synthesise and evaluate conditions. The total duration of the examination is **3** hours. |
| NCIT112: Microsoft Office Applications | The paper shall consist of **three practical** questions carrying **50 marks each**. A candidate will be required to answer **any two**. A print out of the practical outputs together with the softcopies of all files used will be sent to the assessing body. The questioning techniques to be applied should seek for the candidate's ability to, comprehend, apply, analyse, synthesise and evaluate conditions. |

| Paper Name and Code | Examination Format |
|---|---|
| | The duration of this examination shall be 2 **hours**. |
| NCIT114: Real Life Project I | The paper shall consist of continuous assessment marks.<br>The examinations board verifies the authenticity of the awarded marks from the completed projects on the ground and learners' participation through presentations.<br>The total duration of the examination is during 15 weeks of teaching. |

## Year 1 Semester 2 Examinations Format

| Paper Name and Code | Examination Format |
|---|---|
| NCIT 123: Computational Mathematics<br>NCED 125: Entrepreneurship Development | Each paper consists of **eight** questions and the candidate is required to answer any **five. All** questions carry **equal** marks.<br>The questioning techniques to be applied should seek the candidate's ability to remember, comprehend, apply, analyse, synthesise and evaluate conditions. The total duration of the examination is **3** hours. |
| NCIT 121: Basic HTML Web Programming | The paper will consist of **six** questions and the candidate is required to answer any **four. All** questions will carry **equal** marks.<br>The questioning techniques to be applied should seek the candidate's ability to remember, comprehend, apply, analyse, synthesise and evaluate conditions. The total duration of the examination is **3** hours. |
| NCIT 122: Computer Graphics and Photo Editing | The paper shall consist of two papers, **I [**Practical questions**]** and **II [**Knowledge questions**]**. Paper I shall consist of **one compulsory** practical question and will be marked out of **40marks**.<br>The total duration of the examination for **paper I** will be **6 hours.** |

| Paper Name and Code | Examination Format |
|---|---|
| | Paper II shall consist of **eight** questions and will be marked out of **100 marks** and then computed to 60 **marks.** The candidate will be required to answer **any five**, each question will carry **20 marks.** The total duration of the examination for **paper II** will be **3 hours.** |
| NCIT 124: Real Life Project 2 | **The paper shall consist of continuous assessment marks.**<br>The examinations board verifies the authenticity of the awarded marks from the completed projects on the ground and learners' participation through presentations.<br>The total duration of the examination is during 15 weeks of teaching. |
| 1. NCIT 125: Industrial Training I | **The paper shall consist of continuous assessment marks.**<br>The examinations board verifies the authenticity of the awarded marks from the completed projects on the ground and learners' participation through presentations.<br>The total duration of the examination is during 15 weeks of teaching. |

## Year 2 Semester 1 Examinations Format

| Paper Name and Code | Examination Format |
|---|---|
| 1. NCIT 212: Networking and Data Communication<br>2. NCIT 213: Computer Ethics | Each paper consists of **eight** questions and the candidate is required to answer any **five. All** questions carry **equal** marks.<br>The questioning techniques to be applied should seek the candidate's ability to remember, comprehend, apply, analyse, synthesise and evaluate conditions. The total duration of the examination is **3** hours. |
| 3. NCIT 211: Static Website Development | The paper shall consist of two papers, **I [**Practical questions**]** and **II [**Knowledge questions**]**. Paper I shall consist of **one** |

| Paper Name and Code | Examination Format |
|---|---|
| | **compulsory** practical question and will be marked out of **40marks**.<br><br>The total duration of the examination for **paper I** will be **6 hours.**<br><br>Paper II shall consist of **eight** questions and will be marked out of **100 marks** and then computed to 60 **marks.** The candidate will be required to answer **any five**, each question will carry **20 marks.** The total duration of the examination for **paper II** will be **3 hours.** |
| 4. NCIT 214: Real Life Project 3 | **The paper shall consist of continuous assessment marks.**<br><br>The examinations board verifies the authenticity of the awarded marks from the completed projects on the ground and learners' participation through presentations.<br><br>The total duration of the examination is during 15 weeks of teaching and learning. |

## Year 2 Semester 2 Examinations Format

| Paper Name and Code | Examination Format |
|---|---|
| NCCR 221: Introduction to Visual Basic Programming | Each paper consists of **eight** questions and the candidate is required to answer any **five. All** questions carry **equal** marks.<br><br>The questioning techniques to be applied should seek the candidate's ability to remember, comprehend, apply, analyse, synthesise and evaluate conditions. The total duration of the examination is **3** hours. |
| NCIT 222: Basic Computer Maintenance | The paper shall consist of two papers, **I [**Practical questions**]** and **II [**Knowledge questions**]**. Paper I shall consist of **one compulsory** practical question and will be marked out of **40marks**.<br><br>The total duration of the examination for **paper I** will be **6 hours.** |

| Paper Name and Code | Examination Format |
|---|---|
| | Paper II shall consist of **five** questions and the candidate will be required to answer **three**, each question will carry **20 marks.** The total duration of the examination for **paper II** will be **2 hours.** |
| NCIT 221: Introduction to Visual Basic Programming | The paper shall consist of two papers, **I [**Practical questions**]** and **II [**Knowledge questions**]**. Paper I shall consist of **one compulsory** practical question and will be marked out of **40marks**.<br><br>The total duration of the examination for **paper I** will be **6 hours.**<br><br>Paper II shall consist of **eight** questions and will be marked out of **100 marks** and then computed to 60 **marks.** The candidate will be required to answer **any five**, each question will carry **20 marks.** The total duration of the examination for **paper II** will be **3 hours.** |
| NCKS 223: Basic Kiswahili | The paper shall consist of **two** sections **A** (General Kiswahili) and **B** (Journalism Kiswahili). Section **A** shall consist of **five** questions and a candidate will be required to answer any **three**. Section **B** shall consist of **three** questions and a candidate shall be required to answer any **two**. All questions shall carry **equal** marks.<br><br>The questioning techniques to be applied should seek for the candidate's ability to remember, comprehend, apply, analyse, synthesise and evaluate conditions.<br><br>The total duration of the examination shall be **three** hours. |
| 1. NCIT 225: Industrial Training 2 | **The paper shall consist of continuous assessment marks.**<br><br>The examinations board verifies the authenticity of the awarded marks from the completed projects on the ground and learners' |

| Paper Name and Code | Examination Format |
|---|---|
| | participation through presentations.<br>The total duration of the examination is during 15 weeks of teaching and learning. |

## Focus of Education

The focus of education for NCIT emphasizes on the following aspects of learning:

i) Competence-based.
ii) Expert assignments with supporting modules.
iii) Integrated education (knowledge, skills and positive attitude).
iv) Innovation and initiative; (how to learn and solve problems that one has never met before).
v) Upward mobility and concentric curriculum: first year gives a picture of the later years and the profession (intensification).
vi) Entrepreneurship and creativity oriented.
vii) Environmental, health and safety considerations.
viii) Sports, clubs and social interactions.
ix) Focus on the disabled, gender and equity.
x) Sustainability, professional practice, general and specialized law.
xi) Modularized programmes.
xii) Communication skills and understanding of society.
xiii) Real life individual/group project

## Assignments (Individual/Group)

Assignments to be done by learners shall either be individual based or in groups. These will include:

i) Real–life (individual/group practical) projects
ii) Laboratory testing of materials
iii) Workshop practical
iv) Classroom theoretical exercises/tutorials and practical exercises
v) Classroom practical exercises such as drawing
vi) Communications; oral presentation, email, and report writing
vii) Take home assignments to test knowledge and ability to research
viii) Examinations and tests to gauge individual acquisition of knowledge and skills
ix) Workshop and field visits as well as case studies

x) Information communication technology (ICT)

## Role of the Learner

The learner of NCIT is tasked with various roles and these include:

i) Participate fully in class work and assignments.
ii) Be resourceful in group and personal research.
iii) Seek guidance.
iv) Learn to communicate - oral presentation, report writing and development of personal interactive skills.
v) Learn to solve problems they have never faced before (initiation and innovation).
vi) Participate in community-based real life projects.
vii) Asses the performance of staff and usefulness of programmes.
viii) Serve as ambassadors of the institution to the world of work.
ix) Learn to work independently and as part of a team.
x) Keep time; manage oneself and other people effectively.
xi) Participate in sports, social and guild activities.
xii) Participate in environmental health, safety and security awareness and other cross cutting issues.
xiii) Practice leadership roles.
xiv) Learn practical and entrepreneurship skills to enable them start up projects on their own.
xv) Maintain discipline in and outside the Institution.

## Role of Teaching Staff

The teaching staff should:

i) prepare schemes of work and lesson plans.
ii) keep records of attendance, assessment and discipline.
iii) serve as teachers, lecturers, supervisors and coaches.
iv) serve as consultants/supervisors for learners' projects and assignments.
v) assess learners' performance.
vi) contribute to continuing innovation in education.
vii) counsel and guide learners on career and social issues that may affect their studies.
viii) arrange for and carry out internship training placement and supervision.
ix) arrange field tours and site visits.
x) prepare learners for project work as well as assess and record learners' progress.
xi) guide learners in project design and writing.

xii) collaborate in interdisciplinary activities.
xiii) assess effectiveness of the programmes.
xiv) be ethical and role models to the profession.
xv) carry out research, write papers or publish technical books.
xvi) constantly update themselves on the industry's developments and requirements.

## Role of Non-Teaching and Support Staff

Non-teaching staff includes all members who are not directly involved in the Instructing/ learning process of NCIT. They are very vital to the running of this programme and without them other sectors cannot function. Their roles are to:

i) ensure clean, healthy and attractive working and learning environment for learners and lecturers.
ii) ensure timely delivery of materials and services for effective learning process.
iii) maintain ethical and moral conduct.
iv) offer guidance and counselling to learners.
v) manage resources.
vi) ensure security of learners, institution and their / its property.
vii) be flexible and able to carry out any other duties assigned to them by the supervisors.

## Role of Administrative Staff

The administrative staff should:

i) keep custody of institution property (inventories).
ii) plan for smooth running of the institution (mobilize funds and human resources).
iii) ensure equity and gender equality.
iv) link Institution with government, world of work and other stakeholders.
v) support and facilitate learners' activities.
vi) carry out admission of learners.
vii) maintain and uphold the good image of the institution.
viii) ensure high academic standards of the institution.
ix) arrange for graduations and regular meetings of alumni.
x) maintain ethical and moral conduct.
xi) ensure safe and conducive learning environment.
xii) provide learners with adequate materials.
xiii) allow and facilitate inter-institutional activities.
xiv) ensure co-curricular management and its implementation.

xv) appraise staff performance.
xvi) ensure security of learners and their property.
xvii) ensure discipline among staff and learners.
xviii) recommend for promotion or disciplinary action among staff.
xix) appraise other staff.
xx) provide regular support to teaching and learning process.

## Effective Learning Environment

For successful implementation of NCIT, an effective learning environment must be provided, which includes:

i) adequate physical infrastructure such as classrooms, laboratories, workshops and libraries equipped with relevant teaching/learning resources.
ii) electronic learning and teaching environment (ele) such as computers, projectors, printers, photocopiers and printers to support teaching and learning processes.
iii) materials such as models, audio-visual aids, books, manuals, journals and equipment that offer learners and teachers professional situations.
iv) adequate facilities to cater for administration and other logistical terms that adequately support the educational process.
v) medical facilities, proper hygiene and sanitation, proper working and studying environment, good feeding, welfare and security for the learners and staff.
vi) proper motivation and inspiration of staff and learners for them to commit to the certificate programme.
vii) adequate arrangement of seminars, workshops and exhibitions, as well as sites and field visits.
viii) a platform for learners and staff to air out their views such as representation on governing councils.
ix) professional personnel to adequately maintain all facilities such as dormitories.

## Co-Curricular Activities

Co-Curricular activities are part of the institution activities and they enhance teaching/ learning process. Therefore the institution should ensure that there:

i) are adequate sports and recreational facilities.
ii) is an effective learners' guild through which sports, recreational,

religious and cultural activities are channelled and organised, and supported by the institute administration without discrimination.

## Professional Profile for the NCIT Graduate

### Profile Name: Junior IT Support Technician

The IT Support Technician will be responsible for general maintenance of defined computer equipment and for the resolution of identified technical problems for commercial and domestic customers.

| Competences | Duty | Tasks |
|---|---|---|
| The learner:<br>• identifies and uses various types of computer software .<br>• installs and configures a computer system. | **Duty 1:** Software Management**:** | • Test new software.<br>• Make software available to appropriate customers where requested.<br>• Ensure the anti-virus software is installed, kept up to date and working properly on all customers stations, where appropriate.<br>• Set up and maintain user e-mail accounts, when requested by customers.<br>• Provide troubleshooting resolution and updating/upgrading of software to customers. |
| The learner:<br>• identifies the various hardware components of computers and their uses.<br>• installs and configures the entire computer system.<br>• setsup and manage a Local | **Duty 2:**<br>Hardware management | • Maintain customers' computer peripheral equipment, as requested.<br>• Assist other technicians in the office where required.<br>• Keep a log of all technical faults (Support log).<br>• Liaise with external suppliers for the repair of equipment under warranty or maintenance contract.<br>• Provide troubleshooting resolution and updating/upgrading of |

| Competences | Duty | Tasks |
|---|---|---|
| Area Network.<br>• monitors and systematically supports in troubleshooting computer related issues. | | hardware to customers.<br>• Assist with and provide support/troubleshooting for server hardware. |
| | **Duty 3:**<br>Network Management | • Check the network backup daily for maintenance customers.<br>• Set up, maintain and remove user network accounts where appropriate<br>• Carry out routine network maintenance tasks. |
| | **Duty 4:**<br>Office Administration | • Maintain stock for office and website gingerfoxit.com.<br>• Order office stationary where necessary.<br>• Responsible for arranging couriers for any deliveries in the office.<br>• Ordering of ink cartridges and toners for customers, as and when orders are placed Checking deliveries on arrival into the office. |

| **Personal Qualities: A Help Desk Technician will need to Possess the following Qualities** |
|---|
| • Be able to work on his/her own initiative<br>• Demonstrate practical knowledge and problem-solving strategies<br>• Have high quality inter-personal skills<br>• Keep abreast of new developments in software and hardware |

# Programme Structure

## Year 1: Semester 1

| Course Code | Programme Name | LH | PH | CH | CU |
|---|---|---|---|---|---|
| Ncit111 | Fundamentals Of Information Technology | 30 | 60 | 60 | 4 |
| Ncit112 | Microsoft Office Applications | 15 | 120 | 75 | 5 |
| Bccs112 | Basic Communication Skills | 30 | 30 | 45 | 3 |
| Ncit113 | Basic Mathematics | 30 | 30 | 45 | 3 |
| Ncit114 | Real Life Project 1 | 10 | 120 | 60 | 4 |
| **Total Semester Load** | | | | | **19** |
| **Year 1: Semester 2** | | | | | |
| NCIT 121 | Basic HTML Web Programming | 15 | 90 | 60 | 4 |
| NCIT 122 | Computer Graphics and Photo Editing | 15 | 120 | 75 | 5 |
| NCIT 123 | Computational Mathematics | 30 | 30 | 45 | 3 |
| NCED 125 | Entrepreneurship Skills | 30 | 60 | 60 | 4 |
| NCIT 124 | Real Life Project 2 | 10 | 120 | 60 | 4 |
| **Total Semester Load** | | | | | **20** |
| **Recess Term** | | | | | |
| NCIT 125 | Industrial Training 1 | 10 | 100 | - | 4 |
| | | | | | |
| **Year 2: Semester 1** | | | | | |
| NCIT 211 | Static Website Development | 15 | 120 | 75 | 5 |
| NCIT 212 | Networking and Data Communication | 15 | 120 | 75 | 5 |

| | | | | | |
|---|---|---|---|---|---|
| NCIT 213 | Computer Ethics | 15 | 60 | 45 | 3 |
| NCIT 214 | Real Life Project 3 | 10 | 120 | 60 | 4 |
| **Total Semester Load** | | | | | **17** |
| **Year 2: Semester 2** | | | | | |
| NCIT 221 | Introduction to Visual Basic Programming | 30 | 90 | 75 | 5 |
| NCIT 222 | Basic Computer Maintenance | 15 | 120 | 75 | 5 |
| NCKS 223 | Basic Kiswahili | 30 | 60 | 60 | 4 |
| NCIT 224 | Real Life Project 4 | 10 | 120 | 60 | 4 |
| **Total Semester Load** | | | | | **18** |
| **Recess Term** | | | | | |
| NCIT 225 | Industrial Training 2 | 10 | 100 | - | 4 |

# Details of Module Descriptions for Year 1 Semester 1

# NCIT 111: Fundamentals of Information Technology

Duration: 60 Hours

## Overview

This module provides the learner with basic grounding and fluency in the basic information technology skills necessary for information professionals.

## Learning Outcome

By the end of this module, the learner should be able to illustrate the basic hardware and software components of personal computers and their operation.

## Sub-module 1: Introduction to Data and Information

Duration: 12 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• distinguishes between data and information.<br>• uses the different types of information.<br>• describes the benefits of computers.<br>• analyses the challenges associated with computers. | • Distinction between data & information.<br>• Types of information (text, pictures, video, audio).<br>• Benefits and challenges of using computers.<br>• Stages in the Information Processing cycle.<br>- Input | • Lead a guided discussion on the differences between data and information.<br>• Brainstorm the benefits and challenges of using computers.<br>• Display for learners the different types of information and task them to distinguish.<br>• Using illustrations take learners |

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| • describes the stages involved in processing information.<br>• identifies the appropriate data processing method.<br>• analyses the qualities of good information. | - Data processing<br>- Storage<br>- Output<br>• Data processing Methods<br>• Qualities of good information | through the different stages involved in information processing cycle.<br>• Task learners to brainstorm the qualities of good information. |

## Assessment Strategies

Task learners to research and write reports on:

i) The difference between data and information
ii) The stages of processing information
iii) The qualities of good information.

## Teaching and Learning Resources

- Computer
- Demos / Simulations
- Tool kits
- Internet

## Sub-module 2: Introduction to Computer Hardware

Duration: 18 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• identifies the various hardware components of computers and their uses.<br>• illustrates the | **Hardware components and their use**<br>• Input/output Devices<br>- (Keyboard and role of different keys)<br>- Mouse<br>- Printer<br>- Scanner<br>• System unit | • Lead a guided discussion on the role of each of the hardware components to a computer system.<br>• Guide learners' discussion on the components of |

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| components of a system unit.<br>• analyses the functions of the different components of a mother board and computer cards.<br>• demonstrates operation of storage devices, output components and other computer peripherals.<br>• explains the factors to consider when buying a computer and its auxiliary components. | - CPU (CU, ALU, Cache)<br>- Memory (Primary & Secondary)<br>• Motherboard<br>- (Data Cables, Sockets, Ports)<br>• Cards (NIC, VGA, Sound etc.)<br>• Storage components<br>- Hard Drive, CD/DVD)<br>- Portable Devices (Flash Drive,<br>- Card Reader, External Drives<br>• Output components<br>- Printer<br>- Speakers<br>- Monitors<br>- Projector<br>• Other peripherals<br>- UPS<br>- Scanner<br>• Factors to consider when buying a computer or printer. | the system unit.<br>• Task learners to discuss the functions of the different components of a mother board and computer cards.<br>• Use demonstrations to explain: storage devices, output components and other computer peripherals and task learners to identify them.<br>• Task learners to discuss the factors to consider when buying a computer and its auxiliary components. |

## Assessment Strategies

Assign the learner to dismantle and assemble a computer, and make a report on the detailed illustration of the different hardware components.

## Teaching and Learning Resources

- Computer
- Demos / Simulations
- Hardware equipment
- Tool kits
- Internet

## Sub-module 3: Introduction to Computer Software

Duration: 18 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• identifies and use various types of computer software.<br>• installs and configures a computer system.<br>• identifies the functions of the operating system.<br>• manages files stored in the computer and storage media.<br>• creates a folder and a file on a computer desktop in Word Processor. | • Types of computer software<br>• System and application<br>• Formatting, Disk Managing and Partitioning.<br>• Installing Operating System (Windows all versions)<br>• Anti-Virus<br>• Drivers<br>• Functions of Operating system software to a computer<br>• File management.<br>• Creating a folder on the desktop<br>• Saving a file on the desktop or folder. | Lead a guided discussion the software concepts and uses of:<br>• Software and its Types.<br>• System Software and its uses.<br>• Application Software and its uses.<br>• Guide learners to perform installation steps of.<br>• Formatting, disk managing & partitioning.<br>• Operating system (Windows 7).<br>• Anti-Virus and drivers. |

## Assessment Strategies

Assign learners to format and partition a hard disk and later install Windows operating system, and other the missing drivers.

## Teaching and Learning Resources

- Computer
- Demos/simulations
- Internet
- Computer software

## Sub-module 4: Computer Acquisition and Safety

Duration: 12 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• analyses the key factors before purchasing a computer.<br>• starts computer operations.<br>• establishes the speed and storage capacity of a computer.<br>• identifies computer risks factors.<br>• secures computers against virus attacks. | • Factors to consider when buying a computer.<br>• Booting methods<br>• Checking computer speed and storage capacity.<br>• Caring for a Personal computer.<br>• Types of Computer Viruses.<br>• Causes of computer Virus attack.<br>• Managing computer Virus threats. | • Lead a guided discussion on the factors to consider when buying a computer.<br>• Task learners to identify the possible risks and threats to computers.<br>• Lead learners to brainstorm the strategies for keeping computers in good working conditions.<br>• Guide learners to practice the protection of a computer from risks and threats.<br>• Brainstorm the different computer viruses.<br>• Guide learners to scan virus threats. |

### Assessment Strategies

Assign learners class work to list the factors to consider when selecting a computer and explain the different computer threats and how they can be mitigated.

### Teaching and Learning Resources

- Computer specifications/catalogue
- Un-interrupted power supply (UPS)
- Ant virus
- Computer cover
- Dusting materials

## Suggested References

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# NCIT 112: Microsoft Office Applications

Duration: 75 Hours

## Module Overview

This module will provide the learner with basic knowledge and skills to familiarise with the use and working of computers using different modern information communication technologies. He/she will acquire hands-on experience in Microsoft Office applications that will enable him/her to digitally access, process, store, and disseminate information.

## Learning Outcome

By the end of this module, the learner should be able to operate computer apparatus and elementary programs without any assistance.

## Sub-module 1: Microsoft Office Word

Duration: 30 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• loads a Microsoft word processing application.<br>• records text in a new word document.<br>• uses inbuilt formatting tools to make the document appear professional.<br>• writes and sends letters to a large group using mail merging.<br>• generates automated table of contents.<br>• sets page layout to the appropriate | • Loading Microsoft Word<br>• Entering text in a new word document.<br>• Formatting text (font: colour, bold, size, alignment, line spacing, drop caps, word art, text columns).<br>• Inserting (pictures, tables, symbols, page numbers, footers, headers, text columns, footnotes/end notes).<br>• Mail merge<br>• Paper orientation (portrait and landscape),<br>• Page background (text and picture | • Demonstrate to learners how to get started with Microsoft Word.<br>• Use simulations to let learners compose text and proofread.<br>• Guide learners to set page layout and margins.<br>• Demonstrate to learners how to set automated table of contents and task them to practise.<br>• Guide learners to use toolbar buttons to format text to appear professional.<br>• Group learners and |

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| measurements.<br>• saves the document into folder/fixed or portable storage medium.<br>• prints the processed documents. | watermark, page borders/textures)<br>• Automatic Table of contents.<br>• Saving (on desktop, folder, a fixed and portable storage media e.g. flash or compact disk).<br>• Printing | task them to typeset a document with multiple features.<br>• Guide learners to save documents on different media.<br>• Let learners print their own documents. |

## Assessment Strategies

Assign each learner to typeset a document with multiple features in Microsoft Word and produce hard copies of documents.

## Teaching and Learning Resources

- Computer installed with Ms Word
- Internet
- Overhead projector
- Printer
- Compact discs and Flash discs
- Printing paper

## Sub-module 2: Microsoft Office Excel

Duration: 20 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• loads Microsoft electronic spreadsheet application.<br>• records data into a spreadsheet.<br>• uses inbuilt formatting tools to professionally enter data in the | • Loading Microsoft Excel<br>• Entering text/numbers in a worksheet.<br>• Formatting Cells (Currency, borders, commas, decimal places, alignment, merging cells).<br>• Computing data with inbuilt functions (Sum, Average, Max, Min, IF | • Guide learners to get load the Ms Excel application.<br>• Demonstrate the recording of data in a worksheet.<br>• Task learners to compute data using Ms Excel inbuilt functions.<br>• Task learners to |

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| spreadsheet cells.<br>• computes data using Ms Excel inbuilt functions.<br>• presents data using auto generated charts, tables, or graphs.<br>• saves the document into Folder/Fixed or Portable storage medium.<br>• prints worksheet documents. | and Count IF).<br>• Formatting cells (currency, borders, commas, decimal places, alignment, merging cells, text direction).<br>• Data management (sorting, filtering).<br>• Inserting rows, columns,<br>• Presenting data in charts, tables, and graphs.<br>• Page layout (margins and paper orientation).<br>• Printing a spreadsheet | format cells, sort and filter data.<br>• Demonstrate how to create graphs and charts in a spreadsheet.<br>• Demonstrate the computation of data simulations. |

## Assessment Strategies

Assign learners a class work to:

i) type names of learners in their class and sort them in alphabetical order.

ii) filter names of girls from those of boys and use an excel function to establish the total number of girls in the class.

## Teaching and Learning Resources

- Computer installed with Ms Excel
- Internet
- Overhead projector
- Printer
- Compact discs and Flash discs
- Printing paper

## Sub-module 3: PowerPoint Presentations

Duration: 12 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• identifies the features of a PowerPoint presentation.<br>• prepares PowerPoint slides using inbuilt formatting tools.<br>• presents slides with animations.<br>• prints several slides on a page. | • Features of PowerPoint<br>• Creating new slide:<br>• Title Slide<br>• Tabular slide<br>• Two column-Text slide<br>• Formatting a slide:<br>• Background design<br>• Inserting images (clip art and picture)<br>• Customised animations and transitions<br>• Creating a Slide loop<br>• Running a slide show<br>• Printing slides | • Let learners identify the features of a PowerPoint document.<br>• Demonstrate the functions of design tools in Ms Publisher.<br>• Guide learners on how to create new slides<br>• Demonstrate the artistic formatting of a slide.<br>• Let learners simulate the customization of slide transitions. |

## Assessment Strategies

Assign learners to use simulations to create slides and:

i) format them to appear artistic.
ii) create a slide Loop and run the slides.
iii) make PowerPoint presentations in class.

## Teaching and Learning Resources

- Computer installed with Ms Excel
- Internet
- Overhead projector
- Printer
- Compact discs and Flash discs
- Printing paper
- External speakers
- Laser Printer

## Sub-module 4: Microsoft Access

Duration: 13 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• loads a Microsoft Access application.<br>• applies database terminologies correctly.<br>• organises attributes and relations to attain data integrity.<br>• populates database using the Form object/tool.<br>• arranges database using Structured Query Language (SQL).<br>• presents data using the report object/tool. | • Loading Microsoft Access<br>• Object/tools of a database<br>- Table,<br>- Form,<br>- Query<br>- Report<br>• Data attributes<br>• Setting primary and foreign keys<br>• Creating a relationship between 2 tables.<br>• Database normalisation / third normal form (2NF)<br>• Populating a database using electronic forms<br>• Using Reports<br>• Querying a database using clauses (and, or, like)<br>• Computations on captured data (add, subtract, multiply, divide and percentages)<br>• Printing database | • Guide learners to get started with Ms Access.<br>• Demonstrate to learners how to create and normalise a database from (1NF-3NF)<br>• Demonstrate how to populate a database using electronic forms.<br>• Guide learners on how to compute data and query a database.<br>• Demonstrate to learners how database reports are created and displayed, task them to practise.<br>• Guide learners on how to save and print database details. |

## Assessment Strategies

Task learners to create databases and carry out the following processes and printout the final documents:

i) Normalise a database to 2NF

ii) Populate a database using hypothetical data

iii) Compute and query database using AOL Clauses

iv) Display reports of specific columns (attributes)

## Teaching and Learning Resources

- Computer installed with Ms Access
- Internet
- Overhead projector
- Printer
- Compact discs and Flash discs
- Printing paper

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# NCCS112: Basic Communication Skills

Duration: 45 Hours

## Module Overview

This programme introduces the learner to basic knowledge and skills of effective communication within their environment.

## Learning Outcome

By the end of this module, the learner should be able to apply the basic concepts of communication, demonstrate knowledge and skills of communication and utilize the various forms of communication to communicate effectively in their profession.

## Sub-module1: Introduction to Communication

Duration: 08 Hours

| Competence | Content | Teaching and Learning Strategy |
|---|---|---|
| The learner:<br>• defines communication.<br>• identifies the importance of communication in business.<br>• classifies the categories of communication.<br>• applies the different forms of communication. | • Meaning of communication<br>• Importance of communication<br>• Classification of communication (Internal and External)<br>• Forms of communication (Formal and Informal) | • Lead learners to brainstorm the definition of communication.<br>• Brainstorm the importance of communication.<br>• Lead guided discussion on types and forms of communication.<br>• Demonstrate to learners the forms of communication. |

## Assessment Strategy

Assign learners to research on the types and forms of communication and make write-ups.

## Teaching Learning Resources

- Old newspapers
- Old staff minutes
- The Internet

## Sub-module 2: Grammar

Duration: 04 Hours

| Competences | Content | Teaching and Learning Strategy |
|---|---|---|
| The learner:<br>• applies the correct grammar in speeches.<br>• spells words correctly.<br>• construct sentences with the right tenses.<br>• pronounces words correctly. | • Parts of speech (nouns, pronouns, verbs, adverbs, adjectives, conjunctions and interjections)<br>• Spellings<br>• Tenses<br>• Pronunciation | • Guide a discussion on the parts of speech.<br>• Give exercises on spellings of words.<br>• Organise a tutorial for tenses and pronunciations. |

### Assessment Strategies

i) Give learners tasks to construct sentences using nouns, verbs, adverbs, and pronouns.
ii) Task learners to apply different tenses to construct meaningful sentences.

### Teaching Learning Resources

- English dictionary
- The Internet

## Sub-module 3: Communication Process

Duration: 08 Hours

| Competence | Content | Teaching and Learning Strategy |
|---|---|---|
| The learner:<br>• describes the elements of communication.<br>• develops the communication channel.<br>• identifies barriers to effective | • Elements of communication process<br>• Channels of communication<br>• Barriers to effective communication | • Illustrate to learners the communication process.<br>• Illustrate the channels of communication.<br>• Task learners to |

| Competence | Content | Teaching and Learning Strategy |
|---|---|---|
| communication.<br>• identifies solutions to the barriers to effective communication. | • Solution to the barriers of communication | suggest ways of overcoming barriers to communication. |

## Assessment Strategy

Assign learners to form groups to role play on the barriers of effective communication and make reports on lessons learnt from the role play.

## Teaching and Learning Resources

- Documentaries
- English dictionary
- The Internet

## Sub-module 4: Written Communication

Duration: 10 Hours

| Competence | Content | Teaching and Learning Strategy |
|---|---|---|
| The learner:<br>• writes business correspondence.<br>• writes reports.<br>• prepares memos. | • Business letters<br>• Curriculum vitae<br>• Business reports<br>• Memorandum<br>• Notices | • Guide learners on how to write business letters, notices, Memos and reports.<br>• Let learners practise written communication. |

## Assessment Strategy

Give learners exercises to write business letters, memos, notices and reports.

## Teaching and Learning Resources

Samples of:

- Business letters
- Curriculum vitae
- Business reports
- Memorandum
- Notices

## Sub-module 5: Oral Communication

Duration: 8 Hours

| Competence | Content | Teaching and Learning Strategy |
|---|---|---|
| The learner:<br>• justifies the importance of oral communication.<br>• organises meetings.<br>• negotiates for better business terms.<br>• makes effective public speeches. | • Importance of oral communication<br>• Meetings<br>• Negotiations<br>• Public speeches | • Use a video recording reflecting conduct of oral communication.<br>• Organise role plays for learners to demonstrate meetings and negotiations.<br>• Organise debates for learners to practise making public speeches. |

### Assessment Strategy

Assign learners to write minutes of a meeting and describe the tasks performed by the various parties involved.

### Teaching and Learning Resources

- Old staff minutes
- Resolution minutes
- Task force minutes

## Sub-module 6: Listening

Duration: 5 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• justifies the importance of effective listening.<br>• listens effectively.<br>• identifies the causes of poor listening skills. | • Importance of listening<br>• Barriers to effective listening | • Organise a video show on listening behaviour.<br>• Conduct role-plays on the listening modes. |

## Assessment Strategy

Task learners to choose topics, prepare and make public presentations.

## Teaching and Learning Resources

- The Internet
- Documentary
- Old presentations
- Newsletters

## Sub-module 7: Non-verbal Communication

Duration : 06 Hours

| Competence | Content | Teaching and Learning Strategy |
|---|---|---|
| The learner:<br>• applies non-verbal communication to express feelings.<br>• interprets the non-verbal communication made by others correctly.<br>• analyses the advantages and disadvantages of non-verbal communication. | • Types of non-verbal communication<br>- Body language<br>- Facial expressions<br>- Gestures<br>- Postures<br>• Eye contact<br>• Advantages and disadvantages of non-verbal communication | • Use a video recording reflecting different non-verbal communications.<br>• Organise role plays in which learners should emulate different non-verbal communication styles. |

## Assessment Strategy

Ask learners to describe the different types of non-verbal communications

## Teaching and Learning Resource

Video tapes

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# NCIT113: Basic Mathematics

Duration: 45 Hours

## Module Overview

This module introduces to the learner the concepts of Algebraic Expressions, Equations and Inequalities, Discrete Structures, Polynomials and Rational Functions, Exponential and Logarithmic Functions.

## Learning Outcome

By the end of this module, the learner should be able to solve the basic mathematical problems.

## Sub – module 1: Algebraic Expressions

Duration: 8 Hours

| Competences | Content | Teaching/Learning Strategies |
|---|---|---|
| The learner:<br>• evaluates real numbers and rational numbers.<br>• illustrates indicial expressions and standard forms and notations of numbers.<br>• develops and represents computer numbering systems.<br>• converts computer numbering systems and illustrates their application in digital machines. | • Real numbers<br>• Rational numbers<br>• Indices, standard form and notation<br>• Computer numbering systems (binary, decimal, octal, hexadecimal, their conversions and application in digital machines) | • Guide learners through illustrations to evaluate real numbers and rational numbers.<br>• Illustrates indicial expressions and standard forms and notations of numbers.<br>• Develops and represents computer numbering systems<br>• Converts computer numbering systems and illustrates their application in digital machines. |

## Assessment Strategy

Assign learners a class task to compute and convert computer Numbering Systems.

## Teaching and Learning Resources

- Internet
- Calculator

## Sub – module 2: Equations and Inequalities

Duration: 8 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• solves systems of linear equations'<br>• applies quadratic equations to solve computer related problems.<br>• solves problems relating variations and inequalities. | • Linear Equations, Application of Linear Equations<br>• Quadratic Equations, Applications of Quadratic Equations<br>• Variations<br>• Inequalities | • Use illustrations to guide learners in solving linear equations.<br>• Guide learners to solve computer related problems involving quadratic equations.<br>• Guide learners to practise solving situations/equations involving variations.<br>• Lead learners' practice to evaluate linear and fractional inequalities. |

## Assessment Strategy

Assign learners homework to solve computer problems involving equations and inequalities.

## Teaching and Learning Resources

- Tutorials on equations
- Internet
- Calculator

## Sub – module 3: Discrete Structures

Duration: 12 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• solves number relating sets.<br>• determines the domains and ranges of functions.<br>• determines the slopes of lines and equations<br>• plots graphs of functions and relations. | • Sets (Venn diagrams, complements, Cartesian products, power sets)<br>• Domains and Ranges of Functions<br>• Equations of a Line<br>• Graphs of Functions and Relations. | • Guide learners through illustrations to solve number relating sets.<br>• Lead learners through practice to determine the domains and ranges of functions.<br>• Guide learners on how to determine a slope of line and equations.<br>• Guide learners to plot graphs of functions and relations. |

### Assessment Strategy

Assign learners a class exercise to determine slops of lines and equations.

### Teaching and Learning Resources

- Internet
- Graph papers
- Calculators

## Sub–module 4: Polynomials and Rational Functions

Duration: 12 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• simplifies and solves exponential equations.<br>• solves logarithmic functions. | • Exponential Equations<br>• Graphing Exponential Functions.<br>• Simplifying Logarithmic Functions. | • Illustrate how to solve exponential equations and task learners to practise.<br>• Guide learners to evaluate logarithmic functions in different forms. |

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| • writes solutions to and computes exponential growth or decay. | • Change of Base<br>• Solving Logarithmic Equations.<br>• Graphing Logarithmic Functions.<br>• Exponential growth or Decay. | • Lead learners through practice to determine and plot graphs for logarithmic functions.<br>• Task learners to compute exponential growth and decay. |

## Assessment Strategies

Assign learners homework to compute and plot graphs of exponential functions.

## Teaching and Learning Resources

- Internet
- Logarithm table
- Calculator

## Sub - module 5: Logarithms

Duration: 6 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• applies the theory of logarithms to solve logarithmic functions.<br>• use logarithm tables to solve equations involving log functions. | • Theory of logarithms,<br>• Common logarithms.<br>• Equations involving logarithmic functions, | • Illustrate the theory of logarithms.<br>• Guide learners through practice to apply the theory of logarithms to solve logarithmic functions.<br>• Use logarithm tables to solve equations involving log functions. |

## Assessment Strategies

Assign learners a home work to solve logarithms using the theory of logarithms and logarithmic tables.

## Teaching and Learning Resources

- Logarithm table
- Internet
- Calculator

## Suggested References

John Bird (2005). Basic Engineering Mathematics. Fifth edn. Elsevier Ltd.

Bird, J. (2014). Understanding Engineering Mathematics. Worked Solutions to Exercises. 5th edn: Elsevier Ltd.

Howe, J. H., and Badillo, J. A. (September 2010). "Ten Flags." Mathematics Teaching in the Middle School.

Bird J. O. and May A. J. C. (1994). Technician Mathematics. Volume 3. Longman Scientific & Technical.

Glyn, J. (2015). Modern Engineering Mathematics. 5th edn: Pearson Education Limited.

Stroud, K. A. (2013). Engineering Mathematics. 7th edn. UK, MacMillan Education.

Kruglak, H. , Moore, J. T. , Mata-Toledo, R. A. (2009). Basic Mathematics. With Applications to Science and Technology. 2nd edn. Europe, McGraw-Hill Education.

Nahin, P. J. (2014). Inside Interesting Integrals. New York, Springer-Verlag Inc.

Blair K. A. Kelly, V. (2012). Mathematics for Technicians. 7th edn. Europe, McGraw-Hill Education.

Schoenborn, B. and Bradley S. (2010).Technical Math For Dummies. Auflage edn. John Wiley and Sons Ltd.UK

Dekking, F. M. , Kraaikamp, C. , Lopuhaa, H. P. , Meester, L. E. (2007). A Modern Introduction to Probability and Statistics: Understanding Why and How. 1st edn. UK, Springer London Ltd.

# NCIT 114: Real Life Project 1

Duration: 60 Hours

## Module Overview

This module will develop the learner's ability to be more creative and innovative in the field of production and service delivery. It will aid the learner to make unique his/her products/services so as to attract more customers and make retention of the existing ones.

## Learning Outcome

By the end of this module the learner should be able to produce products with unique features.

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• typesets documents.<br>• sets up and manages a software or stationary kiosk.<br>• installs software.<br>• prints and photocopies documents.<br>• mobilises funds for the business start-up. | • Identification of new customers to the business<br>• Utilisation of the available to add value to products.<br>• Mobilisation of funds for the business | • Lead a guided discussion on how to identify potential customers.<br>• Guide learners on how to utilize the available resources to add value to their products.<br>• Guide a discussion on how to mobilise funds for the business start-up.<br>• Guide learners on various ways of evaluating a business. |
| **Sample Projects**<br>• Software kiosk<br>• Stationery shop<br>• Telephone services<br>• Development of Posters and Post cards, Corporate Identity Cards, Brochures and Report cards | | |

## Suggested References

Artemieva, E. (2016). The Application of Projects Methods in Training Students in Secondary Vocational Education. Olympiáda techniky Plzeň. https://otik.uk.zcu.cz/bitstream/11025/21421/1/Artemieva.pdf

Project Report of Computer Shop Management: https://www.scribd.com/doc/266737244/Project-Report-on-Computer-Shop-Management-System

Project Computer Sales and Service Centre (2):

https://www.scribd.com/doc/94974615/Project-Computer-Sales-and-Service-Centre-2

# Year 1: Semester 2

# NCIT 121: Basic HTML Web Programming

Duration: 60 Hours

## Module Overview

This module is designed to equip the learner with basic skills of coding a webpage using Hyper Text Mark-up Language (HTML).

## Learning Outcomes

By the end of this module, the learner should be able to:

i) follow the workflow of programming to read and modify existing HTML code.
ii) review the common HTML tags used in modern web development.

## Sub – module 1: Introduction to HTML

Duration: 12 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• applies the syntax of opening, closing, and self-closing tags..<br>• uses tags to create different elements including the fundamental elements that structure a web page.<br>• comprehends the workflow of programming and how to read and modify existing code. | • Definition of HTML<br>• Simple HTML Documents<br>• HTML Tags<br>• Web Browsers<br>• HTML Page Structure | • Lead a guided discussion about HTML.<br>• Load note pad and guide learners to create a simple HTML file.<br>• Guide learners to identify basic parts of an HTML web page layout:<br>- <!DOCTYPE html><br>- <html><br>- <head><br>- <title><br>- <body><br>- <h1><br>- <p> |

## Assessment Strategies

Assign learners a list of HTML tags and task them to identify the use of each. Task learners to write HTML statements using Notepad or Text editor and view it in web browser

## Sub – module 2: HTML Tags

Duration: 12 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner reviews the common HTML tags used in modern web development. | • HTML document<br>• HTML headings<br>• HTML paragraphs<br>• HTML links<br>• HTML images<br>• HTML buttons<br>• HTML lists | • Guide learners on how to add/code; headings, paragraphs, links, images, buttons and lists into their HTML file.<br>• Emphasise how the Start and End tags are coded.<br>• Lead learners in a discussion to identify examples of tags that are self-closing. |

## Assessment Strategies

Task learners to insert the additional functionalities learnt in the lesson, into their respective HTML files and make presentations.

## Sub-module 3: HTML Attributes

Duration: 16 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• adds more information to their tags to give them control over function and appearance.<br>• utilizes attributes to create webpage links. | • The Title Attribute<br>• The href attribute<br>• The width and height attributes<br>• The alt attribute<br>• Style attribute | • Use the <img> tag to guide learners on how to provide additional information to an element.<br>• Demonstrate how to adjust height and width of the image.<br>• Guide learners on the tag on alternate text for images .<br>• Guide learners how to adjust the paragraph colour. |

## Assessment Strategies

Assign learners a class work to add an image stored in their folder and adjust the image to appropriate size.

## Sub – module 4: Working with HTML Paragraphs

Duration: 4 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• defines an HTML paragraph.<br>• inserts a single line break.<br>• defines pre-formatted text. | • Paragraph tags<br>• The use of line breaks in HTML<br>• How to control the line breaks in HTML<br>• Background colour | • Use an example to guide learners on how to define HTML paragraphs <p>.<br>• Guide learners on how to create line breaks <br>.<br>• Guide learners to define preformatted text <pre>.<br>• Guide learners on how to change the background Colour. |

## Assessment Strategy

Assign learners a class task to create paragraphs, line breaks and set pre-formatted.

## Sub – module 5: Working with Images

Duration: 4 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner alters width, height, and metadata for their images. | • Adding images<br>• Adding inline images<br>• Title and Alt attribute | • Guide learners through demonstrations to alter the width, height and meta data of images. |

## Assessment Strategy

Assign learners to take photos using cell phones and place them into their created web pages.

## Sub – module 6: HTML Styles

Duration: 4 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner styles HTML elements by enhancing their appearance. | • Background Colour<br>• Text Colour<br>• Text font<br>• Text size<br>• Text alignment | • Guide learners to apply elements styles to include;<br>- Background-Colour<br>- Colour for text<br>- Font-family for text fonts<br>- Font-size for text sizes<br>- Text-align for text alignment |

## Assessment Strategy

Assign learners to change the background Colour, and the size, Colour, font type and alignment of the text elements.

## Sub – module 7: HTML Text Formatting

Duration: 4 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner formats text elements using HTML tags. | • Bold formatting<br>• Italic formatting<br>• Emphasised formatting<br>• Subscript formatting<br>• Superscript formatting<br>• Marked formatting<br>• Marked inserted<br>• Marked deleted<br>• Formatting abbreviations and acronyms | Guide learners on how to apply tags such as;<br>• <b> element<br>• <i> element<br>•  element<br>• <sub> element<br>• <sup> element<br>• <mark> element<br>• <ins> element<br>• <del> element<br>• <abbr> |

## Assessment Strategies

Assign learners an exercise to apply the HTML text formatting tags on their own created web pages.

## Sub - module 8: HTML Forms

Duration: 4 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner codes actions that can be executed by the user through a button. | • Form with text input<br>• Form with radio button input<br>• Form with text fields and a submit button | Guide learners on how to tag the:<br>• the <form> Element<br>• the <input> Element<br>• one-line input field for text input.<br>• radio button.<br>• button for submitting the form data. |

## Assessment Strategies

Assign learners to develop and include into their HTML file a Form with text input, radio button and a submit button.

## Teaching and Learning Resources

- Computers with a web browser and text editor
- Projector

## Suggested References

Schildt, H., (2003). C++ from the Ground Up. 3rd edn, McGrawHill/Osborne.

Chuck Easttom, (2003). C++ Programming Fundamentals. Charles River Media.

Bjarne Stroustrup, (2000). The C++ Programming Language. Addison-Wesley.

# NCIT 122: Computer Graphics and Photo Editing

Duration: 75 Hours

## Module Overview

This module equips the learner with skills of taking abstract internal representation of objects and turning them into images.

## Learning Outcomes

By the end of this module, learners will be able to professionally produce and edit computer graphics.

## Sub-module 1: Getting Started

Duration: 12 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• installs and loads Adobe Photoshop.<br>• navigates the interface.<br>• setup the document size.<br>• selects appropriate tools from the toolbox.<br>• customises/sets the workspace.<br>• sets required general preferences.<br>• uses keyboard commands. | • Installing and loading Adobe Photoshop<br>• Navigating the Adobe Photoshop interface.<br>• Menu bar, Workspace, panels and context menus.<br>• Setting-up the document<br>• Creating a New file<br>• Opening an existing file from a disk (Fixed or portable media)<br>• View open documents or files<br>• importance of the Toolbox<br>• Selection Tools (Move, Marquee, Crop, Magic wand, Lasso, Brush, eye dropper)<br>• Paint Tools ( Healing brush, Clone stamp, Eraser, paint bucket, blur and Colour) | • Guide learners to install Adobe Photoshop on the computer.<br>• Demonstrate to learners how to set; Page Size and Orientation, Resolution, Colour Mode and Background Contents.<br>• Take learners through the layout of Adobe Photoshop interface (Menu bar, Toolbar, The image, Image name, Palettes).<br>• Guide learners to open an image from a disk. |

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| | • Drawing tools (Path, pen, Shape and Text)<br>• View Tools (Free hand, Magnify and background/foreground colour)<br>• Customising the Workspace<br>• Paper orientation, size, and colour mode<br>• Setting general preferences<br>• Using Keyboard Shortcuts | |

## Assessment Strategy

Assign learners to install adobe Photoshop onto their personal computers and use selection and paint tools to design basic shapes/pictures.

## Teaching and Learning Resources

- Computer with graphics editing software
- Projector

## Sub-module 2: Working with Layers and Panels

Duration: 20 hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• uses design layers and panels to improve images.<br>• moves, deletes and merges layers.<br>• enhances layers using blending | • Creating new layer, Duplicate layer and Turning a selection into a layer<br>• Moving, aligning, applying style or transform layers<br>• Deleting, Locking/unlocking<br>• Merging layers | • Guide learners on how to:<br>- create new layers<br>- use sliders to change the foreground and background Colour modes<br>- select Image Areas<br>- save a Selection<br>- modify a Selection<br>- choose Colour from the spectrum of colours displayed<br>- use swatches to add a |

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| mode.<br>• opens images from storage locations.<br>• places an image into a workspace.<br>• zooms images to appropriate levels.<br>• applies style effects to improve appearance of images.<br>• improves brightness and contrast of the display. | • Applying pre-set styles to a layer<br>• Copying layer styles<br>• Filling and grouping layers (Opacity, Tolerance, Foreground/background Colour and gradient overlay styles)<br>• Using blending modes<br>• Applying design and style effects<br>• Adjusting Colour brightness/contrast (using levels and curves) | customised Colour to the library<br>- use style palette to View, select and apply present layer styles<br>- access any recent stage of the image alteration<br>- guide learners to apply and edit effects to a group of layers in Photoshop (delete, create new fill or adjustments, delete or organise images with multiple layers)<br>- guide learners to identify hidden tools using small black triangles in the right-hand corner. |

## Assessment Strategy

Task learners to work with basic selection and paint tools to design pictures/shapes.

## Teaching and Learning Resources

- Computer with graphics editing software
- Simulations on graphic editing of layers and panels
- Projector

## Sub-module 3: Working with Images

Duration: 24 hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• customises image/picture colours. | • Zooming and Panning images<br>• Resizing digital photos<br>• Rotating and aligning | • Guide learners to work on a photo or image and practise how to:<br>- move object on the |

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| • removes hot spot from faces already created photos.<br>• removes an image/object from the project.<br>• repairs faint or damaged images/photos.<br>• paints images/shapes.<br>• retouches photos. | images<br>• Moving images<br>• Merging images<br>• Image Correction using;<br>- Removing an object from an image<br>- Adjusting contrast and brightness using curves<br>- changing background and foreground colours<br>- Changing image Colour (Colour vs black and white)<br>- Improving faint images (Adding flash and removing red eye)<br>- using swatches to customize colours<br>• Retouching photos:<br>- Smoothening photos<br>- removing the Red eye<br>- Removing Hot spots<br>- Adding flash light | page using the move tool button.<br>- use marquee tool to drag the marquee over the area of the image.<br>- use Lasso tool to draw a freehand border around the area of the image to be selected.<br>- select all object in a document with the same or similar fill Colour, stroke weight, stroke Colour, opacity or blending mode.<br>- control what the Magic Wand tool selects.<br>- drag the crop tool over the part of the image that you want to keep/resize.<br>- use eye dropper to take Colour samples from colours on the page and display them in the colour boxes.<br>• Task learners to carry out retouching tasks on a photo. |

## Assessment Strategy

Assign learners to open a faint or damaged digital photo from a camera, scanner, phone or internet and retouch and correct the photo colour.

## Teaching and Learning Resources

- Computer with graphics editing software
- Simulations on image editing
- Projector

## Sub-module 4: Working with Text and Shapes

Duration: 14 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• draws relevant shapes and text path.<br>• adds text to an image.<br>• types text along a circular text path.<br>• formats text to improve the appearance.<br>• designs business documents.<br>• paints images/ shapes. | • Typing in a design area<br>• Creating a text path<br>• Drawing shapes (circle, rectangle, square)<br>• Typing text along a circular text path<br>• Formatting text (Font style, size and colour)<br>• Applying design effects to text<br>• Designing business documents (Logos, badges, stamps, certificates, invitation cards, receipts, banks lips, book covers)<br>• Painting images/shapes | • guide learners on how to use selection tools to draw shapes<br>• Demonstrate how to type along a drawn path.<br>• Guide learners to format and apply design effects to text.<br>• Brainstorm with learners on the various business designs that can be generated using the drawing and painting tools.<br>• Provide learners with samples of business documents and guide them to imitate the designs<br>• Task learners to paint images/shapes. |

## Assessment Strategy

Assign learners to design business documents such as a circular stamp for the office of the Guild President, a certificate, invitation card and book cover with artistic features.

## Teaching and Learning Resources

- Computer installed with graphics editing software
- Simulations on graphic editing of layers and panels
- Projector

## Sub-module 5: Using Auto Commands, Saving and Printing

Duration: 5 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• uses auto commands<br>• designs posters, stamps, banners, receipts and book covers.<br>• saves files/projects in a desired format (pdf and jpeg).<br>• creates an email account and sends an email of the designed project.<br>• prints projects/files. | • Auto Tone, Colour and Contrast.<br>• Colour swatches<br>• Creating and using gradients.<br>• Saving into different file formats (JPEG, PDF, print applications).<br>• Printing<br>• Creating email account.<br>• emailing a designed project | • Guide learners on how auto commands can quicken photo editing.<br>• Demonstrate to learners how to convert files to various formats.<br>• Guide learners to create an email using their phones or a computer.<br>• Task them to send an email of their designs to your email, evaluate their designs and reply pointing at areas they can improve. |

## Assessment Strategy

Task learners to correct images/photos using auto commands, convert file formats to PSD and PDF, and printout a copy of their project.

## Teaching and Learning Resources

- Computer with a hard disk space 500GB with Adobe Photoshop installed
- VGA Monitor/Screen with minimum resolution (1280 x 768)
- Overhead Projector

- White board / markers
- Printer laser (Colour)
- Internet connectivity

## Suggested References

Ammeraal, L. and Zhang, K. (2007). Computer Graphics for Java Programmers, Second Edition, John-Wiley & Sons, ISBN 978-0-470-03160-5.

Rogers, D. (1998). Procedural Elements for Computer Graphics. McGraw-Hill.

James D. Foley, Andries Van Dam, Steven K. Feiner and John F. Hughes (1995). Computer Graphics: Principles and Practice. Addison-Wesley.

Hearn, D. and Baker, M. P. (1994). Computer Graphics. Prentice-Hall.

Hill, F. S. (2001). Computer Graphics. Prentice Hall.

McConnell, J. J. (2006). Computer Graphics: Theory Into Practice. Jones & Bartlett Publishers.

Parslow, R. D., Prowse, R. W., Richard Elliot Green (1969).

Shirley, P. et el. (2005). Fundamentals of Computer Graphics. A.K. Peters, Ltd.

Slater, M., Steed, A. and Chrysantho, Y. (2002). Computer Graphics and Virtual Environments: from Realism to Real-time. Addison-Wesley.

Wolfgang, H. (2008). Interactive Environments with Open-source Software. New York, Springer Wien.

# NCIT 123: Computational Mathematics

Duration: 45 Hours

## Module Description

This module gives the learner a strong mathematical base to be able to tackle further Information Technology (IT) computational problems. The module brings together mathematical topics which are commonly used in the general computer science. It builds a foundation for other modules that need special mathematical backgrounds.

## Learning Outcome

By the end of this module, the learner should be able to solve computer science problems using basic mathematical concepts.

## Sub – module 1: Boolean Algebra

Duration: 8 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• evaluates Boolean variables.<br>• illustrates the laws of Boolean algebra<br>• constructs logic statements.<br>• develops compound statements<br>• constructs truth tables. | **Boolean variable**,<br>- addition<br>- subtraction<br>- multiplication<br>**Boolean algebra,**<br>- laws of Boolean algebra,<br>- logic statements,<br>- compound statements,<br>- truth tables | • Guide learners through illustrations to evaluate Boolean variables.<br>• Illustrate to learners the laws of Boolean algebra and task them to practice.<br>• Guide learners to construct logic statements.<br>• Task learners to develop compound statements.<br>• Guide learners to practice through illustrations to constructs truth table. |

## Assessment Strategies

Assign learner homework to apply the laws of Boolean algebra to construct logic statements and truth tables.

## Teaching and Learning Resources

- Calculators
- Internet
- Mathematics books on Boolean Algebra, By V. Khanna

## Sub – module 2: Linear Algebra

Duration: 20 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner<br>• evaluates homogeneous and non-homogeneous linear equations.<br>• illustrates and solves matrix equations.<br>• illustrates matrices, determinants and the properties of determinants.<br>• solves for minors and cofactors in matrices.<br>• evaluates classical ad joints and illustrates Cramer's rule. | • Linear equations:<br>- systems of linear equations, homogeneous equations<br>- nonhomogeneous equations<br>• Matrices:<br>- matrix algebra,<br>- identity matrix,<br>- transpose of a matrix,<br>- matrices and systems of linear equations,<br>- elementary row operations and echelon matrices<br>• Types of matrices, determinants: the determinant,<br>• properties of determinants,<br>• minors and cofactors,<br>• classical ad joint, Cramer's rule | • Brainstorm the meaning of linear equations.<br>• Guide learners to evaluate homogeneous and non-homogeneous linear equations.<br>• Use illustrations to guide learners to solve matrices.<br>• Lead learners through discussion on the properties of determinants, minors and cofactors, classical ad joint, Cramer's rule.<br>• Guide learners on how to evaluate determinants and illustrate the properties of determinants.<br>• Illustrate to learners on how to solve for minors and cofactors in matrices.<br>• Guide learners to evaluate classical ad joints and illustrate Cramer's rule. |

## Assessment Strategies

**Assign learners homework to evaluate matrices and classical ad joints.**

## Teaching and Learning Resources

- Calculators
- Online tutorials on linear algebra

## Sub–module 3: Introduction to Differential and Integral Calculus

Duration: 8 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• solves differential equations.<br>• evaluates single integrals. | • Differential calculus<br>• Integral (single integral) calculus | • Lead a guided discussion on the basic principles of differential and integral calculus.<br>• Guide learners through illustrations to solve differential equations.<br>• Guide learners to evaluate single integrals. |

## Assessment Strategy

Assign learners class tasks to evaluate differential and integral calculus.

## Teaching and Learning Resources

- Calculators
- Online tutorials on differential and integral calculus

## Sub – module 4: Probability Theory

Duration: 16 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner<br>• evaluates probability using the different approaches.<br>• manipulates the properties of probabilities.<br>• determines the different elements of a sample space.<br>• evaluates discrete random variables. | **Concept of probability**<br>- axiomatic approach,<br>- relative frequency approach,<br>- probability as a function of the sample space,<br>- probability of an event,<br>- properties of probabilities of events, addition and multiplication laws<br>**Concept of sample space:**<br>- sample space<br>- sample point<br>- tossing a coin<br>- rolling a die<br>- independent events<br>- exclusive events<br>- mutually exclusive events<br>• Discrete random variables | • Lead a guided discussion on the concept of probability.<br>• Illustrate to learners the different approaches to the concept of probability.<br>• Guide learners to manipulate the properties of probabilities.<br>• Lead a guide practice to determine the different elements of a sample space.<br>• Task learners to evaluate discrete random variables. |

### Assessment Strategies

Assign learners to research on the concept of probability and sample space, and write reports.

### Teaching and Learning Resources

- Calculators
- Tutorials on probability theory

## Sub – module 5: Numerical Methods

Duration: 8 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• demonstrates modelling of flow charts and dry runs.<br>• determines and illustrates loops from decision boxes. | • **Concept of probability:**<br>- Introduction to flow charts and dry runs<br>- Concept of loops from decision boxes | • Lead a guided discussion on the concept of flow charts and dry runs.<br>• Guide learners through demonstrations the modelling of flow charts and dry runs.<br>• Task learners to determine and illustrate loops from decision boxes on flow chart. |

## Assessment Strategies

Assign learners to model flow charts of a computer program and illustrate loops.

## Teaching and Learning Resources

- Calculators
- Sample flow charts and loops
- Online tutorials on Numerical methods

## Suggested References

Bird, J. (2005). Basic Engineering Mathematics. 5th edn. Elsevier Ltd.

Bird, J. (2014). Understanding Engineering Mathematics. Worked solutions to exercises. 5th edn: Elsevier Ltd.

Howe, J. H. and Badillo, J. A. (September 2010). "Ten Flags." Mathematics Teaching in the Middle School. 16.2 72-75.

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Nahin, P. J. (2014). Inside Interesting Integrals. New York, Springer-Verlag Inc.

Alldis, B. K. and Kelly, V. (2012). Mathematics for Technicians. 7th edn. Europe, McGraw-Hill Education.

Schoenborn, B.and Simkins, B. (2010). Technical Math for Dummies. (Auflage edn). UK, John Wiley and Sons Ltd.

Dekking, F. M., Kraaikamp, C., Lopuhaa, H. P. and Meester, L. E. (2007). A Modern Introduction to Probability and Statistics: Understanding Why and How. 1st edn. UK, Springer London Ltd.

# NCED 125: Entrepreneurship Skills

Duration: 60 Hours

## Module Overview

The module will equip the learner with creative and innovative skills and ability to look out for opportunities by manipulating the natural and man-made resources into business. It is intended to make the learners develop a positive career attitude towards entrepreneurship as a means of making a living. It covers units concerning creativity and innovation, scanning the environment for business opportunities, planning a business, managing a business, and entrepreneurial ethics.

## Learning Outcomes

By the end of this module, the learner should be able to:

i) generate business ideas.

ii) identify viable business opportunities.

iii) mobilises business resources

iv) start and manage a business.

## Sub-module 1: Introduction to Entrepreneurship

Duration: 8 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• appreciates the basic concepts and reasons for studying entrepreneurship.<br>• identifies the characteristics and qualities of an entrepreneur.<br>• describes the classifications entrepreneurs and the | • Definition of Entrepreneurship<br>• Basic concepts in entrepreneurship<br>• Reasons for studying entrepreneurship<br>• Characteristics and qualities of an entrepreneur<br>• Classification of entrepreneurs<br>• Entrepreneurial process | • Lead learners into a brainstorming session about the reasons of studying entrepreneurship and the basic concepts used.<br>• Demonstration on the characteristics and qualities of a good entrepreneur and task learners to practise entrepreneurship. |

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| entrepreneurial processes.<br>• identifies the roles of an entrepreneur. | • Roles of entrepreneurship | • Guide learners into a brainstorm on the entrepreneurial classifications and roles of entrepreneurship. |

## Assessment Strategy

Task learners in groups to discuss and make presentations on characteristics of Entrepreneurs.

## Teaching and Learning Resources

- Internet
- Computer and Projector

## Sub-module 2: Creativity

Duration 7 Hours

| Competences | Contents | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• describes the steps and importance of creativity.<br>• identifies the barriers to creativity and how to overcome them. | • Definition of creativity<br>• Steps of creativity<br>• Importance of creativity<br>• Barriers to creativity<br>• How to overcome the barriers to creativity | • Lead learners into a guided discussion about the steps and importance of creativity.<br>• Lead a brainstorm the barriers of creativity and how to overcome them. |

## Assessment Strategy

Task learners to discuss the barriers to creativity and how to overcome them and make reports

## Teaching and Learning Resources

- Internet resources; Business - Wikipedia, Google my business,
- Computer and Projector

## Sub-module 3: Innovation

Duration: 7 Hours

| Competences | Contents | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• defines innovation.<br>• appreciates the attributes of a good innovator.<br>• describes the types and importance of innovation. | • Definition of innovation<br>• Attributes of a good innovator<br>• Types of innovation<br>• Sources of innovation<br>• Importance of innovation | • Guide a brainstorm the attributes of a good innovator.<br>• Lead a guided demonstration on the types of innovation and task learners to practise innovation. |

## Assessment Strategy

Task learners in groups to identify attributes of a good Innovator

## Teaching and Learning Resources

- Online resources; Business - Wikipedia, Google my business,
- Computer and Projector
- Tutorials on innovation

## Sub-module 4: Small Scale and Medium Enterprises (SMEs)

Duration: 8 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• appreciates the sources of business idea.<br>• identifies the characteristics of SMEs and their sources of capital.<br>• describes the challenges faced by SMEs and the remedies to the challenges. | • Definition of SME<br>• Sources of Business ideas<br>• characteristics of small scale enterprises<br>• Sources of capital to small scale enterprises.<br>• Importance of small scale businesses.<br>• Challenges faced by small scale businesses in Uganda.<br>• Remedies to the challenges | • Lead discussion on sources of business ideas and presentations.<br>• Lead a brainstorm session on characteristics, source of capital, importance, challenges and remedies of small scale enterprises. |

### Assessment Strategies

Organise a field study for the learner to the research on the characteristics and challenges faced by small and medium enterprises and task him/her to make reports.

### Teaching and Learning Resources

- Online resources; Business - Wikipedia, Google my business, Consortium of Entrepreneurship educators
- Computer and Projector
- Tutorials running of SMEs

## Sub-module 5: Business Planning

Duration: 8 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• appreciates the importance and the major components of a business plan.<br>• describes the challenges of business plan. | • Definition of a Business plan<br>• Components of a Business plan<br>• Importance of a Business plan<br>• Challenges of Business planning | • Lead a brainstorm session on the importance of Business plan.<br>• Guided demonstration on the major components of a business plan.<br>• Guided discussion on challenges of business planning. |

### Assessment Strategy

Task learners to prepare a simple business plan.

### Teaching and Learning Resources

- Online resources; Business - Wikipedia, Google my business, Consortium of Entrepreneurship educators
- Computer and Projector
- Tutorials preparation of business plans

## Sub-module 6: Entrepreneurship Ethics

Duration: 7 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• appreciates the importance of entrepreneurship ethics.<br>• identifies the roles of ethics in entrepreneurship. | • Introduction to Entrepreneurship ethics<br>• Importance of Entrepreneurship ethics<br>• Role of ethics in entrepreneurship. | • Guided discussion in groups the importance and role of ethics in entrepreneurship.<br>• Brainstorm session on ethical challenges facing |

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| • describes the ethical challenges facing entrepreneurs and their solutions. | • Ethical challenges facing entrepreneurs and solution | entrepreneurs and how to overcome them. |

## Assessment Strategy

Assign learners to discuss in groups the importance and role of ethics in entrepreneurship and task them to make presentations.

## Teaching and Learning Resources

- Business – Wikipedia website
- Google my business website
- Consortium of Entrepreneurship educators website
- Computer and Projector

## Suggested References

Business – Wikipedia:
https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=2ahUKEwjP-8GM7pTfAhWmMewKHY86ANQQFjAAegQIABAC&url=https%3A%2F%2Fen.wikipedia.org%2Fwiki%2FBusiness&usg=AOvVaw26f8ercsrI9Uck7vWDoxLh

Google my business:
https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=2ahUKEwjErjO7ZTfAhVPzqQKHb4GCJ8QFjAAegQIAhAC&url=https%3A%2F%2Fwww.google.com%2Fbusiness%2F&usg=AOvVaw00Gjmi7RV4vCJ30118Yrzg

Start Teaching Entrepreneurship Today:
http://www.apexstriving.com/entrepreneurship-lesson-plans/

Consortium for Entrepreneurship Education's website: http://www.entre-ed.org

Deakins, D. and Freel, M. S. (2009). "Entrepreneurial activity, the economy and the Importance of Small Firms". Entrepreneurship and small firms.

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Scheufele, D. and Moy, P. (2000). Twenty-five Years of the Spiral of Silence: A Conceptual Review and Empirical Outlook. International Journal of Public Opinion Research. 12. pp. 3–28. doi:10.1093/ijpor/12.1.3.

Bowman, E. (July 2011). Entrepreneur Training Manual. 3rd edn: Certified Entrepreneur Workbook. Guanzi Institute Press. Bruder, Jessica (September 2013). "The Psychological Price of Entrepreneurship." Inc. (Winner 2014 Annual Awards Contest of the Deadline Club)

Dana, L. P. (2010). "Nunavik, Arctic Quebec: Where Co-operatives Supplement Entrepreneurship," Global Business and Economics Review 12 (1/2), January 2010, pp. 42–71.

Foo, M. D. (2011). "Emotions and entrepreneurial opportunity evaluation". Entrepreneurship Theory and Practice.

Halloran, J. W.(2014). Your Small Business Adventure: Finding Your Niche and Growing a Successful Business. ALA/Huron Street Press.

Leitão, J. and Baptista, R. (10 June 2009). Public Policies for Fostering Entrepreneurship: A European Perspective. Springer Science Business Media.

Minniti, M.; Moren, L. (2010). "Entrepreneurial Types and Economic Growth". Journal of Business Venturing. 25 (3): 305–314. doi:10.1016/j.jbusvent.2008.10.002.

Rea, C. and Volland, Nicolai (2015). The Business of Culture: Cultural Entrepreneurs in China and Southeast Asia, 1900-65. UBC Press. Shane, S. and Venkataraman, S. (2000). The Promise of Entrepreneurship as A Field of Research. Academy of Management Review. 25 (1): 217–226. doi:10.5465/amr.2000.2791611. JSTOR 259271.

Shane, S. (2013). "The Genetics of Entrepreneurial Performance". International Small Business Journal. 31 (5): 473–495. doi:10.1177/0266242613485767.

Zahra, S. A. (2009). "A Typology of Social Entrepreneurs: Motives, Search Processes and Ethical Challenges". Journal of Business Venturing. 24 (5): 519–532. doi:10.1016/j.jbusvent.2008.04.007.

Zhang, S.X.; Cueto, J. (2015). "The Study of Bias in Entrepreneurship". Entrepreneurship Theory and Practice. **41** (3): 419–454. doi:10.1111/etap.12212.

Lowe, R.; Marriott Sue (2006). Enterprise: Entrepreneurship and Innovation: Concepts, Contexts and Commercialization. Butterworth-Heinemann.

# NCIT 124: Real Life Project II

Duration: 60 Hours

## Module Overview

This module presents an opportunity for the learner to demonstrate skills obtained especially in using a computer to generate graphics and edit photos.

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• typesets documents.<br>• sets up and manages a software or stationary kiosk.<br>• installs software and operate a computer system.<br>• prints and photocopies documents. | **Sample Projects**<br>• Designing certificates<br>• Badges<br>• Logos<br>• Stamps<br>• Photo retouching<br>• Typesetting a Research booklet | Guide learners through the sample projects and encourage them to raise funds and start up the projects. |
| **Sample Projects**<br>• HTML Web programming<br>• Web editing<br>• Designing computer graphics and editing Photos | | |

## Teaching and Learning Resources

- Sample projects and project reports
- Computer
- Laser Printers
- Web browser / text editor
- Sample programs

## Suggested References

Artemieva, E. (2016). The Application of Projects Methods in Training Students in Secondary Vocational Education. Olympiáda techniky Plzeň. https://otik.uk.zcu.cz/bitstream/11025/21421/1/Artemieva.pdf

Project report of computer shop management:
https://www.scribd.com/doc/266737244/Project-Report-on-Computer-Shop-Management-System

Project Computer Sales and Service Centre (2):

https://www.scribd.com/doc/94974615/Project-Computer-Sales-and-Service-Centre-2

# NCIT125: Industrial Training I

Duration: 388 Hours (6 Weeks)

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• puts in practice the skills and knowledge acquired in class.<br>• demonstrates ability to use a computer to solve general user needs. | **Suggested areas of training**<br>• Using MS office Applications to input and printout information.<br>• Web programming using HTML program.<br>• Retouch photos using graphic application.<br>• Applying safety measures when handling ICT equipment.<br>• Demonstrating effective communication skills. | • Lead a guided discussion on the Industrial Training Guidelines.<br>• Guide learners how to use log books(daily activity record books).<br>• Guide learners how to write industrial training reports.<br>• Guide a discussion on the required professional behaviour during industrial training. |

## Assessment Strategy

i) Field supervisor scores the candidate according to the attached Industrial Training Guidelines

**ii)** Academic supervisor visits the trainee in the field to observe the trainee performance, also interviews the field supervisor about the trainee's performance.

## Teaching and Learning Resources

- Telephone contact/address of the trainees
- Industrial training placements
- Industrial training assessment Forms
- Sample industrial training reports
- Computer
- Laser printers
- Web browser / text editor
- Sample programs

# Year 2 Semester 1

# NCIT211: Static Website Development

Duration: 75 Hours

## Module Overview

The module introduces Learners to local and wide area network web design and development and, World Wide Web Consortium (W3C) standard mark-up language and services of the Internet.

## Learning Outcome

By the end of this module, the Learner should be able to use WYSIWYG web page authoring tools and graphic software to create simple and usable web sites.

## Sub – module 1: Introduction to Cascading Style Sheets (CSS)

Duration: 4 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• describes CSS<br>• changes the styles of the elements using various ways of inserting CSS HTML files.<br>• reduces file size<br>• easily maintains web pages<br>• improves flexibility | • Meaning of CSS<br>• Internal CSS<br>• External CSS<br>• Inline Styles<br>• The Div Tag | • Brainstorm the meaning of CSS<br>• Lead a guided discussion about the difference between HTML and CSS.<br>• Guide learners on placing the CSS code within the tags of each (X) HTML file you want to style with the CSS.<br>• Guide learners on how to use text editor and place a link in the head section of every (X(HTML file you want to style with the CSS file. |

## Assessment Strategies

Assign learners a task to use the internal CSS and external CSS to style an existing HTML file.

## Teaching and Learning Resources

- Web browser
- Text editor e.g. Chrome or Mozilla and
- Computers with Internet connectivity
- Projector
- Tutorials on CSS

## Sub – module 2: CSS Syntax

Duration: 6 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• applies the correct syntax when dealing with multiple properties of each selector.<br>• applies a single expression to change the appearance of all text in an (X)HTML file. | • The 3parts of CSS syntax<br>• Inheritance<br>• Different States of anchor tag<br>• Sibling and child selector of CSS | • Lead a guided discussion about; Selector (Property: Value).<br>• Guide learners on how to nest<br>• Guide learners on how commas, bracket and quotations are used to separate multiple properties e,g body { background: #eeeeee; font-family: "Trebuchet MS", Verdana, Arial, serif; }<br>• Guide learners on how to nest one element inside another e.g body {font-family: Verdana, serif;}. |

## Assessment Strategy

Assign learners a class exercise to change the font style of the entire HTML file to Tahoma.

## Teaching and Learning Resources

- Web browser
- Text Editor e.g. Chrome or Mozilla
- Computers with Internet connectivity
- Projector

## Sub – module 3: CSS Classes

Duration: 3 Hours

| Competences | Content | Teaching/Learning Strategies |
|---|---|---|
| The learner:<br>• changes the appearance of a selected word leaving other text untouched. | • Changing the Colour of a selected word while leaving the rest untouched. | Guide learners on how to use the <Span Class-"element "  |

### Assessment Strategy

Assign learners a task to add their names into the HTML file and let them change the colour of their first name.

### Teaching and Learning Resources

- Web browser,
- Text Editor e.g Chrome or Mozilla and
- Computers with Internet connectivity
- Projector

## Sub – module 4: CSS IDS

Duration: 4 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner uses CSS IDs to declare, to style the layout elements of a page that will only be needed once and uses classes to style text that has to be declared multiple times. | Difference between CSS Classes and CSS IDs | Using an example guide learners on when to use either of the Classes of IDs e.g. container {width: 80%; margin: auto; padding: 20px; border: 1px solid #666; background: #ffffff;} |

### Assessment Strategy

Assign learners a task to apply CSS IDs and layout elements of web page.

## Teaching and Learning Resources

- Web browser,
- Text Editor e.g Chrome or Mozilla and
- Computers with Internet connectivity
- Projector

## Sub – module 5: CSS Margins

Duration: 3Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner declares the margin between an (X) HTML element and the elements around it. | **Margins**<br>• Top<br>• Bottom<br>• Right<br>• Left | Use an example to guide learners on how to set the margin property for Top, Left, Right and bottom of an element. |

## Assessment Strategy

Give an assignment requiring learners to declare all the margins of an element in a single property.

## Teaching and Learning Resources

- Web browser,
- Text Editor e.g. Chrome or Mozilla and
- Computers with Internet connectivity
- Projector
- Tutorial on setting of margins

## Sub – module 6: CSS Padding

Duration: 5 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner applies the appropriate padding style. | • Meaning of Padding<br>• Single Vs all the 4 values of an element | • Using an example guide learners on how to declare all 4values of an element.<br>• Guide learners to visualize the effect of the undeclared values. |

## Assessment Strategy

Assign learners a task on declaring of the 4values of an element.

## Teaching and Learning Resources

- Web browser
- Text Editor e.g. Chrome or Mozilla
- Computers with Internet connection
- Projector

## Sub – module 7: CSS Text Properties

Duration: 12 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• Sets the text Colour<br>• applies appropriate line space between letters.<br>• aligns text<br>• decorates text<br>• formats text to either lowercase, Capitalize<br>• controls the white space in an (X)HTML file<br>• adjusts the spaces between words. | • Colour<br>• Line spacing (Normal and Length)<br>• Text Align<br>• (Left, Right, Center, Justify)<br>• Text Decoration<br>• (Underline, line through, blink)<br>• Text Transform<br>• White space<br>• Word spacing | • Guide learners on how to set the Colour of text using possible values<br>• Demonstrate to learners how the adjust space between letters using pxs.<br>• Guide learners on how to align text.<br>• Guide learners on how to decorate text.<br>• Guide learner on how to changes text to lowercase or Capitalize or none in a file.<br>• Guide learners on how to control the White space in an (X)HTML file.<br>• Guide learners on how to adjust the spaces between words e.g. at 5pxs. |

## Assessment Strategy

Assign learners an exercise to adjust CSS text properties in the web page.

## Teaching and Learning Resources

- Web browser
- Text Editor e.g Chrome or Mozilla and
- Computers with Internet connectivity
- Projector

## Sub – module 8: CSS Font Properties

Duration: 4 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner sets font style weight, and size. | • Font-family<br>• Font size<br>• Font weight | • Guide learners how to set font to italic, bold, normal.<br>• Guide learner on hot to set font size using the choices for values.<br>• Guide learners on how to control the weight of text in an element with font-weight property. |

## Assessment Strategies

Assign learners to set font size and control the weight of text in an element with font-weight property.

## Teaching and Learning Resources

- Web browser,
- Text Editor e.g. Chrome or Mozilla and
- Computers with Internet connectivity
- Projector
- Sample page with CSS font properties

## Sub – module 9: CSS Anchors and Links

Duration: 8 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• changes the colour of the link when:<br>- no event is occurring.<br>- the user has already visited the url.<br>- the user places their mouse pointer over the link. | • a:link {Colour: #009900;}<br>• a:visited {Colour: #999999;}<br>• a:hover {Colour: #333333;}<br>• a:focus {Colour: #333333;} | • Guide learners on how to change link colour when:<br>- no event is taking place,<br>- the user has already visited the url.<br>- the user places their mouse pointer over the link. |

### Assessment Strategies

Assign learners a home work to set the features a url link to change the colour when the user places their mouse pointer over the link.

### Teaching and Learning Resources

- Web browser,
- Text Editor e.g. Chrome or Mozilla and
- Computers with Internet connectivity
- Projector

## Sub – module 10: CSS Background

Duration: 8 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• styles the background of an element in one declaration with the background property e.g background: #ffffff url (path_to_image) top left no-repeat fixed.<br>• makes a choice of letting the background image scroll with the page or be fixed when the user scrolls down the page with background-attachment property.<br>• declares a colour for the background of an element using the background-colour property.<br>• positions an image used for the background of an element using the background-position property. | • Background Attachment<br>• Background Colour<br>• Background Image<br>• Background Position | • Guide learners on how to:<br>- style the background of an element in one declaration with the background property e.g background: #ffffff url(path_to_image) top left no-repeat fixed.<br>- make a choice of letting the background image scrolls with the page or is fixed when the user scrolls down the page with background-attachment property.<br>- declare a Colour for the background of an element using the background-Colour property.<br>- position an image used for the background of an element using the background-position property. |

### Assessment Strategy

Assign learners a class task to style the background features of the website.

## Teaching and Learning Resources

- Web browser,
- Text editor e.g. Chrome or Mozilla
- Computers with Internet connectivity
- Projector

## Sub – module 11: CSS Borders

Duration: 6 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• sets the Colour of a border independently with the border-colour property.<br>• sets the style of the border independently with the border-style property. | • Border Colour (Transparent RGB Colour mode)<br>• Border Style (dashed, dotted, groove etc)<br>• Border Width (Length, Thin, Medium, Thick) | • Guide learners to:<br>- set the Colour of a border independently with the border-colour property<br>- set the style of the border independently with the border-style property |

## Assessment Strategies

Assign learners a laboratory task to modify the website by setting the border Colour, border Style and Border Width.

## Teaching and Learning Resources

- Web browser
- Text Editor e.g. Chrome or Mozilla
- Computers with Internet connectivity
- Projector
- Sample CSS borders

## Sub – module 12: Creating a Complete Website Project

Duration: 12 Hours

| Competences | Content | Teaching and Learning Strategy |
|---|---|---|
| The learner:<br>• codes the webpage.<br>• adds a header and the navigation area.<br>• applies iframes.<br>• creates a footer.<br>• includes the contact us page. | • Creating the coding of webpage<br>• Creating a basic designing layout for webpage<br>• The header and the navigation Area<br>• The right side Area<br>• Making the main Post<br>• Applying Iframes<br>• Creating Footer<br>• Creating Contact Us page | Guide learners on how to create a complete website project by adding more features like footer and relevant web pages. |

### Assessment Strategy

Assign learners to design the webpage outlook with basic features like iframes, footer and contact page.

### Teaching and Learning Resources

- Web browser
- Text Editor e.g. Chrome or Mozilla and
- Computers with Internet connectivity
- Projector
- Tutorials on website development

### Suggested References

Nielsen, J. and Tahir, M. (October 2001), Homepage Usability: 50 Websites Deconstructed, New Riders Publishing, ISBN 978-0735711020

Campbell, J. (2017). Web Design: Introductory. Cengage Learning. p. 27.

Bureau of Labor Statistics, U.S Department of Labor (2012-). "Information Security Analysts, Web Developers, and Computer Network Architects". Occupational Outlook Handbook, 13 edn.

# NCIT212: Networking and Data Communication

Duration: 75 hours

## Module Overview

This module, introduces the learner to the basics of data communications and networks. It also imparts theoretical and practical skills of linking up computers and sharing computer resources.

## Learning Outcome

By the end of this module, the learner should be able to demonstrate data flow in simple networks, design a network, terminate cables and configure a network connection.

## Sub – module 1: Network Basics

Duration: 20 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• identifies and uses network component<br>• classifies various network connections<br>• assigns IP addresses to network components<br>• punches various type of cable connectors<br>• identifies different LAN topologies.<br>• evaluates the | • Meaning of networks<br>• Advantages of networking to an organisation<br>• Challenges faced when using computer network<br>• Strategies to overcome the challenges<br>**Components of a LAN**<br>- Node, NIC and Modem<br>- Access point<br>- Hub (active & Passive)<br>- Repeaters & Bridge<br>- Switch & Routers<br>• **Network cable connectors**<br>- RJ-45 | • Lead a guided discussion and identify the components of a computer network while classifying.<br>• Lead a guided discussion on the importance components of a LAN<br>• Guide learners on how to examine the use of the different connectivity devices.<br>• Demonstrate the punching of various types of cable connectors.<br>• Demonstrate to the |

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| relevancy of networks.<br>• classifies Networks.<br>• plans for a LAN and assigns IP addresses. | - BNC<br>- db9 serial pinout<br>- DB-25(Parallel)<br>• **Classification of networks.**<br>- LAN<br>- Topologies (Ring, Star, Bus and hybrid)<br>- WLAN (Wi-Fi and Bluetooth)<br>- WAN<br>• **IP Addressing and Sub-netting.** | learners how to sub-net and configure IP addresses.<br>• Lead a guided discussion on the different network cable connectors.<br>• Guide learners on how to classify network.<br>• Lead a guided discussion on how to subnet a Local Area Network. |

## Assessment Strategy

Assign learners a class task to assign IP addresses to the network printer and workstations.

## Teaching and Learning Resources

- Networking software
- Packet tracer
- Working computers
- Network cards
- Cables
- Switch device
- Crimping tool

## Sub-module 2: Transmission Media and Components

Duration: 18 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• distinguishes digital from analog signals.<br>• identifies Transmission media.<br>• uses the appropriate network cables.<br>• setup a Peer-to-Peer and server based network.<br>• setup a hotspot for unguided data transmission. | • Difference between analog and digital signals<br>• Forms of data transmission<br>- Simplex<br>- Half duplex<br>- Full duplex<br>• Layout of various cables and their usage:<br>- Coaxial cable<br>- Twisted Pair Cable (Cat 5, Cat 6)<br>- Fibre Optic Cable<br>- Peer-to-Peer LAN<br>- Server Based/Star LAN<br>- Hybrid Network<br>• Wireless Media Systems<br>- Terrestrial Microwaves<br>- Radio Waves<br>- Satellite<br>- Wireless Communication<br>- Transmission Impairments and errors<br>• IP Address classes, ranges and their default subnet masks | • Guide learners to distinguish digital from analog signals.<br>• Lead a guided discussion on the uses of the different forms of data transmission.<br>• Use samples to discuss with learners the role of the different network cables.<br>• Lead a guided practice to layout various cables and discuss their uses.<br>• Guide learners to setup a peer-to-peer and server based network.<br>• Take learners through transmission impairments occurrence and how to overcome such errors in analog and digital Transmission. |

## Assessment Strategy

Assign learners to research on transmission impairments occurrence and write reports on how to overcome such errors in Analogue & Digital Transmission.

## Teaching and Learning Resources

- Presentations
- Videos/demos simulations manuals
- Computers
- Demonstration software
- Projector
- Reading Texts,
- Network cables,
- Networking tool box with crimping tool
- Internet connectivity

## Sub-module 3: Internet Connectivity

Duration: 9 Hours

| Competence(s) | Content | Teaching and Learning Strategies |
|---|---|---|
| The Learner:<br>• connects to the internet.<br>• identifies services offered by the Internet<br>• connects to the Internet.<br>• creates an email account.<br>• sends and receives electronic messages.<br>• Searches for information using search engines.<br>• applies the internet terminologies. | • Components needed to connect to the internet<br>• Services offered by internet<br>• Disadvantages of the internet to an organisation<br>• Creating an email account<br>• Sending and receiving an Email.<br>• Searching for information on the internet.<br>• Network terminologies<br>- Data<br>- Bandwidth<br>- Up loading<br>- Down loading | • Brainstorm the components needed to connect to the Internet.<br>• Guide learners on how to connect to the Internet and create an email account<br>• Discuss to the learners on how to send and receive messages.<br>• Guide learners on how to apply cyber ethics. |

## Assessment Strategies

Assign learners to create personal emails, search and download information on internet and send the downloaded information to a specific email address provided by the teacher.

## Teaching and Learning Resources

- Computers with internet connectivity,
- Overhead projector

## Sub – module 4: Basics of Operating System Software

Duration: 12 Hours

| Competence(s) | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• explains the differences between 32 bits and 64 bits.<br>• configures disks and device drivers,<br>• prepares partitions and volumes discs.<br>• installs/upgrade and troubleshoots windows operating system. | • Client End/Window<br>• 32 bits and 64 bits OS<br>• FAT-16/32, NTFS,<br>• Configuration of Disks<br>• Preparing Partitions and Volumes<br>• Configurations of Device Drivers<br>• Install / Upgrade / Troubleshoot Operating System | • Task learners to brainstorm the differences between 32 bits and 64 bits operating system.<br>• Guide learners to configure disks and device drivers, and prepare partitions and volumes.<br>• Guide learners on how to install/upgrade and troubleshoot windows operating system software. |

## Assessment Strategies

Assign learners to install and upgrade Windows 7 on the end user computer.

## Teaching and Learning Resources

- Windows 7 with SP3
- Computers,
- Overhead projector
- Demos / videos manuals

## Sub – module 5: Troubleshooting a Local Area Network

Duration: 16 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• identifies common Network problems.<br>• examines the causes of network failures.<br>• applies preventive measures to prevent network failures.<br>• assigns static IP address.<br>• connects to a WiFi Connection.<br>• fixes authentication problem on a WiFi<br>• re-sets a WiFi Router. | • Steps to diagnose a network problem<br>• Causes of network failures<br>• How to prevents causes of network failures<br>• Troubleshooting basic tools for Windows connection<br>• Guided network<br>- How to connect to a guided network<br>- How to use a static IP instead of the DHCP address<br>• Unguided/Wireless<br>- How to connect to a WiFi network<br>- How to solve authentication problems on a WiFi<br>- How to re-set a WiFi Router | • Lead a guided discussion about the common network problems.<br>• Guide learners on how to:<br>- assign Static IP address on the LAN.<br>- get a WiFi connect to a WiFi.<br>- solve authentication problems.<br>- Re-set a WiFi Router. |

### Assessment Strategies

Assign learners to develop a server based network and create 5user accounts with limited access right.

### Teaching and Learning Resources

- Windows 7/Windows 8
- Driver Pack 15
- Computers
- Overhead projector
- Demos / Videos Manuals

### Suggested References

Comer, D. E. (2000). Internetworking with TCP/IP - Principles, Protocols and Architecture (4th ed.). Prentice Hall.

Radia, P. (1999). Interconnections: Bridges, Routers, Switches, and Internetworking Protocols. 2nd edn. Addison-Wesley.

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Securing Your Business with Cisco ASA and PIX Firewalls, Greg Abelar, Cisco Press, May 27, 2005.

Deploying Zone-Based Firewalls, Ivan Pepelnjak, Cisco Press, Oct. 5, 2006.

Perlman, R. and Speciner, M. (2002). Network Security: PRIVATE Communication in a PUBLIC World, Charlie Kaufman |, Prentice-Hall,.

Angus Wong and Alan Yeung, (2009). Network Infrastructure Security, Springer,.

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Comer (2000). Protocols are to Communication What Algorithms are to Computation. Sect. 1.3 - Internet Services, p. 3

Comer (2000). Glossary of Internetworking terms, p.686: term encapsulation.

Comer, D., E. (2000). Internetworking with TCP/IP - Principles, Protocols and Architecture. 4th edn. Prentice Hall.

Internet Engineering Task Force abbr. IETF (1989): RFC1122, Requirements for Internet Hosts -- Communication Layers, R. Braden (ed.). http://tools.ietf.org/html/rfc1122.

# NCIT 213: Computer Ethics

Contact 45 hours

## Module Overview

This module is a new branch of ethics that will enable the learners to demonstrate ethical behaviours in the field of Information and Communication technology that is growing and developing rapidly.

## Sub-module 1: Introduction to Information Communication Technology Ethics

Duration: 12 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• describes the meaning and different forms of ICT ethics.<br>• applies the different categories of ethical behaviours when using the computer.<br>• describes the importance ICT of ethical behaviour to users. | • Meaning of ethics<br>• Forms of ICT Ethics<br>• The ethics of using computers between the person and the same.<br>• The ethics of using computers between the persons.<br>• Ethics between the user and device.<br>• Importance of Ethical behaviour to a user | • Brainstorm the meaning of ethics and the different ICT ethics.<br>• Brainstorm the unethical behaviours of computer users in society.<br>• Lead a guided discussion on the forms of ICT Ethics.<br>• Lead a guided discussion on the importance of Ethical behaviours to different users. |

## Assessment Strategy

Assign learners to research on the importance of ICT ethical behaviours to the single users and organizations, and make presentations.

## Teaching and Learning Resources

- Computers,
- Overhead Projector
- Internet
- Demos / videos, manuals
- Documents on Ethical code of conduct

## Sub-module 2: Scenarios of Computer Misuse and Effects to Society

Duration: 8 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• analyses the effects of a computer misuse.<br>• identifies the effects of computer misuse. | • Media/software piracy<br>• Intellectual property theft<br>• Ransom ware attacks<br>• Identity theft<br>• Financial theft<br>• Pornography | • Lead a guided discussion on situations involving computer misuse.<br>• Brainstorm with the learners about the effects of computer misuse. |

## Assessment Strategy

Assign learners to identify and make a write-up discussion on the different scenarios of computer misuse and their effects to society.

## Teaching and Learning Resources

- Computers
- Overhead projector
- Internet
- Demos/videos manuals
- Documents on ethical code of conduct

## Sub-module 3: Forms of Computer Software Attacks

Duration: 8 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• identifies threats to computer software.<br>• documents the software attacks for mitigation.<br>• mitigates cyber threats systematically. | • Attack form<br>• Viruses<br>• Worms<br>• Trojan horses<br>• Denial Of Service<br>• Brute force<br>• Steps to mitigate cyber risks | • Lead a guided discussion on the various software attacks.<br>• Brainstorm the methods of mitigating the threats caused by the software attacks.<br>• Lead a guided discussion on the 5steps to mitigate cyber threats. |

### Assessment Strategy

Assign learners specific cyber risks and task them to write a description of the steps they would follow to mitigate the risks.

### Teaching and Learning Resources

- Computers
- Overhead projector
- Internet
- Demos/videos, manuals on software attacks
- Documents on ethical code of conduct

## Sub-module 4: Ethical Challenges in Information Technology

Duration: 8 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner identifies the ethical challenges encountered in IT. | • Security<br>• Privacy issues<br>• Copyright infringement<br>• Increased pressure on IT Experts<br>• Digital divide | • Lead a guided discussion on each of challenges encountered in IT giving examples.<br>• Task learners to establish solutions to each of the challenges. |

## Assessment Strategy

Assign learners to research and make class presentation on the solutions to each of the challenges encountered in IT.

## Teaching and Learning Resources

- Computers,
- Overhead projector
- Internet
- Demos/videos manuals
- Documents on ethical code of conduct
- Documentaries on IT ethical challenges

## Sub-module 5: Ethical Code of Conduct in ICT

Duration: 9 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner applies the 10 commands of computer ethics. | • The 10 commandments of computer ethics<br>• Importance of a cyber law | • Lead a guided discussion on the 10 commandments of computer use.<br>• Brainstorm the importance cyber laws in Uganda. |

## Assessment Strategy

Assign learners to research on the importance of a cyber-law in Uganda and make reports.

## Teaching and Learning Resources

- Computers,
- Overhead Projector
- Internet
- Online Demos / Videos on ICT ethics
- Documents on ICT Ethical code of conduct

## Suggested References

Bynum, T. W., (2000). The Foundation of Computer Ethics. ACM SIGCAS Computers and Society.

Floridi, L. (1999). Information Ethics: On the Theoretical Foundations of Computer Ethics (PDF). Ethics and Information Technology.

Floridi, L. and Sanders, J. W. (2002). "Computer Ethics: Mapping the Foundationalism Debate" (PDF). Ethics and Information Technology.

Haag, Stephen; Cummings, Maeve; McCubbrey, Donald J. (2003). Management Information Systems: For the Information Age (4th ed.). New York: McGraw-Hill. ISBN 978-0-07-281947-2.

Johnson, D. G. (2001). Computer Ethics. 3rd edn: Upper Saddle River, NJ: Prentice Hall.

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Quinn, M. J. (2011). Ethics for the Information Age. 4th edn. Boston, MA: Addison-Wesley. Moor, J. H. (1985). What is Computer Ethics? In Bynum, Terrell Ward Computers & Ethics. http://rccs.southernct.edu/what-is-computer-ethics/#what-is-computer-ethics: Blackwell.

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Stamatellos, G. (2007). Computer Ethics: A Global Perspective. Jones and Bartlett. Tavani, H. T. (2004). Ethics and Technology: Ethical Issues in an Age of Information and Communication Technology. Hoboken, NJ: John Wiley and Sons. American Philosophical Association's Newsletter on Philosophy and Computers: https://en.wikipedia.org/wiki/American_Philosophical_Association

Ethics in Computing - a list of links to ethical discussions in Computer Science courtesy of North Carolina State University Undergraduates with guidance from Dr. Edward F. Gehringer: http://ethics.csc.ncsu.edu/

IEG, the Information Ethics research Group at Oxford University: http://web.comlab.ox.ac.uk/oucl/research/areas/ieg/

Bynum, Terrell. "Computer Ethics: Basic Concepts and Historical Overview". In Zalta, Edward N. Stanford Encyclopedia of Philosophy: https://plato.stanford.edu/entries/ethics-computer/

Coleman, Kari Gwen. "Computing and Moral Responsibility". In Zalta, Edward N. Stanford Encyclopedia of Philosophy: https://plato.stanford.edu/entries/computing-responsibility/

The Research Center on Computing & Society: http://www.southernct.edu/organizations/rccs/

The International Journal of Cyber Ethics in Education (IJCEE): http://www.igi-global.com/ijcee

# NCIT 214: Real Life Project III

Duration: 60 Hours

## Module Overview

The module is intended to enable the learner to improve the customer care and expand on their projects. It will involve application of social skills to make customers keep coming back for more products/services.

## Learning Outcome

By the end of this module, the learner should be able to present a variety of real-life products as well as the procedures followed to make them.

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• improves on the quality of products/services .<br>• makes more products to expand on the project.<br>• presents the project products/services . | • Product/service modification<br>• Project expansion<br>• Project presentation | • Guidelines on how to improve on the project outputs.<br>• Demonstrate to learners the need to diversify the project services.<br>• Let learners present the outcomes of their projects. |

## Sample Projects

- Developing of a Static Website
- Setting and maintaining a Local Area Network (LAN)

## Assessment Strategy

Let the learners chose a project and execute it till completion.

## Teaching and Learning Resources

- Computers
- Sample project reports
- Sample workshop reports

## Suggested References

Elena, A. (2016). The Application of Projects Methods in Training Students in Secondary Vocational Education. Olympiáda techniky Plzeň. https://otik.uk.zcu.cz/bitstream/11025/21421/1/Artemieva.pdf

Project Report of Computer Shop Management: https://www.scribd.com/doc/266737244/Project-Report-on-Computer-Shop-Management-System

Project Computer Sales and Service Centre (2):

https://www.scribd.com/doc/94974615/Project-Computer-Sales-and-Service-Centre-2

# Year 2 Semester 2

# NCIT221: Introduction to Visual Basic Programming

Duration: 75 hours

## Module Overview

This module introduces the learner to Visual Basic as one of the different programming languages from which computer applications are created. The module is founded on the BASIC language and will provide learners with a variety of tools to create user-friendly applications with Graphic User Interface.

## Learning Outcome

By the end of this module, the learner should be able to identify the Elements of a Visual Basic Application and create simple event driven applications which encourage higher user interaction through icons, menus, pointers, buttons, and dialog boxes.

## Sub-nodule 1: Elements of a Visual Basic Application

Duration: 8Hours

| Competence(s) | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• downloads and installs Visual Studio onto their personal computers.<br>• lists the two elements of a Visual Basic Application.<br>• states the purpose of a GUI and what elements does a user see in a GUI.<br>• explains what does a Visual Basic toolbox provide.<br>• names and describes the four most commonly used Toolbox objects. | **Creating the Graphical User Interface**<br>• Downloading and installing Visual S<br>• Object types and their use<br>- Label<br>- Textbox<br>- Button<br>- Checkbox<br>- Radio Button,<br>- List Box<br>- Combo Box | • Discuss to learners on the history of VB and how to download Visual studio onto their computers.<br>• Guide learners to discuss the role of the different elements in Visual Basic Application.<br>• Discuss the different objects in the VB Toolbox. |

| Competence(s) | Content | Teaching and Learning Strategies |
|---|---|---|
| • states when an application is run, what does a design form become?<br>• codes and Identifies what is executed when an event occurs. | - Time and<br>- Picture Box<br>• Coding an Event (stop watch timer) | • Guide learners to create a stop watch timer as their first application in VB.Net. |

## Assessment Strategy

Assign learners home work to research and make write-ups on the following tasks:

i) The purpose of a GUI and the elements seen by a user in a GUI
ii) Explanation on what a Visual Basic toolbox provides.

## Teaching and Learning Resources

- Computers
- Overhead projectors
- Internet
- Software resources like VB v6, VB .Net or VB .Net 2003

## Sub-module 2: Getting Started in Visual Basic

Duration: 12 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• starts Visual Basic .NET<br>• uses the Toolbox.<br>• sets the object's properties.<br>• runs an application.<br>• saves and recalls a project. | • Starting Visual Basic<br>- Visual Basic .NET Start page<br>- Recent<br>- Open project<br>- New Project dialogue<br>• Using the Toolbox<br>• Initial form Window<br>• Setting an Object's Properties<br>• Running an Application | • Guide learners on how to start Visual Basic .NET<br>• Lead learner's practice in utilizing the objects in the toolbox to create an application.<br>• Task learners to run the application.<br>• Guide learners |

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| | • Saving and Recalling a Project | through the process of saving and recalling a project. |

## Assessment Strategy

Assign learners a class work to describe the process of saving and recalling a project.

## Teaching and Learning Resources

- Computers
- Overhead projectors
- Internet
- Software resources like VB v6, VB .Net or VB .Net 2003

## Sub-module 3: Visual Basic Data

Duration: 7Hours

| Competence(s) | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• describes the types of visual basic data.<br>• uses the dim statements to declare variables. | • Types of Visual Basic Data<br>• Numeric Data<br>• Non Numeric Data<br>• Suffixes and Literals<br>• Declaration of various variables using the dim statements | • Lead a guided discussion on the types of Visual Basic Data.<br>• Guide learners on how to use the Dim Statements. |

## Assessment Strategy

Assign learners a class task to use the Dim statements to declare two Numeric Variables and two non-numeric Variables.

## Teaching and Learning Resources

- Computers
- Overhead projectors
- Online tutorials on the use of Dim statements
- Software resources like VB v6, VB .Net or VB .Net 2003

## Sub-module 4: Managing Visual Basic Data

Duration: 10 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• assigns values to the variables.<br>• identifies and uses appropriate arithmetic operators. | • Assigning Values to the Variables<br>- Mathematical Expression<br>- A number<br>- A string<br>- A Boolean value (True or False)<br>• Arithmetic Operators in Visual Basic<br>^ Exponential<br>• Multiplication / Division + or & String concatenation. | Using examples guide learners on how to:<br>- assign values to the variables.<br>- apply the appropriate arithmetic operators. |

### Assessment Strategy

Assign learners a task to create, categorise and attach values to different variables.

### Teaching and Learning Resources

- Sample programs with operators
- Computers
- Overhead projectors
- Internet
- Software resources like VB v6, VB .Net or VB .Net 2003

## Sub-module 5: Controlling Program Flow

Duration: 10 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The Learner:<br>• applies the conditional operators.<br>• identifies and uses | • Getting to know the conditional Operators<br>= Equal to<br>> More Than<br>< Less Than<br>>= More Than and Equal | • Using examples guide learners on how to apply the conditional operators.<br>• Lead learners |

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| appropriate arithmetic operators. | <= Less than and equal<br><> Not Equal to<br>• Logical Operators<br>- And<br>- Or<br>- Xor<br>- Not<br>• Using if….. Then….Elseif …..Else Statements with operators | practise to apply logical operators.<br>• Guide learners to practise on the use of if….. Then….Else if….. Else Statements with operators. |

## Assessment Strategy

Assign learners to develop a program and use if….. Then….Elseif …..Else Statements with operators

## Teaching and Learning Resources

- Sample programs with operators
- Computers
- Overhead projectors
- Online videos on use of logical operators
- Software resources like VB v6, VB .Net or VB .Net 2003

## Sub-module 6: Adding an Event Procedure Code

Duration: 12 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• codes structure of an event procedure in Visual Basic<br>• codes simple message box<br>• codes a message box with<br>• codes a message box with title | • Structure of an event procedure<br>• A Simple Message Box<br>• A Message Box with Title<br>• A Message Box with Title and Yes/No Buttons Message Boxes with Title, OK | • Discuss to the learner the structure of an event procedure.<br>• Guide learners on how to code a simple message box.<br>• Guide learners on how to code a message box with title.<br>• Guide learners on how to code a message box with |

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| and Yes/No buttons<br>• codes message boxes with title and OK button and information icon<br>• debugs a code | Button, and Information Icon<br>• Correcting Errors | title and Yes/No buttons.<br>• Guide learners on how to code message boxes with title and OK button and information icon.<br>• Guide learners on how to identify and debug an error in the code. |

## Assessment Strategy

Assign learners to design and run an event procedure using the Message Box, Showing the working method in the form's click event procedure.

## Teaching and Learning Resources

- Sample programs with Message Box operators
- Computers
- Overhead projectors
- Internet
- Software resources like VB v6, VB .Net or VB .Net 2003

## Sub-module 7: Adding Controls

Duration: 10 Hours

| Competence(s) | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• adds buttons and textbox controls.<br>• creates on the interface a button with and without focus whereby a user.<br>- clicks the object.<br>- presses the tab key until the object receives the focus.<br>- uses the code to activate the focus.<br>- designs a form with labels.<br>- changes fore colour and back colour. | • Simple program interface<br>• Adding Buttons<br>• Adding Text Box Control<br>• Setting Initial Properties<br>• Looking at the Focus and Tab Sequence<br>• Label Control (Form With Labels)<br>• Changing Fore Colour and Back Colour | • Guide learners on how to add in a form buttons and textbox controls.<br>• Guide learner on how to create a button with and without focus.<br>• Guide learners on how to create a form with labels.<br>• Guide learner on how to change fore colour and back colour. |

### Assessment Strategy

Assign learners an exercise to:

i) activate the code window for a form that has a button control and determine the number of event procedures available.

ii) create a text box named txtOne that has a red foreground colour and a blue background colour. The initial text displayed in the box should be 'Welcome to Visual Basic'.

### Teaching and Learning Resources

- Sample programs with Message Box operators
- Computers
- Overhead projectors
- Internet
- Software resources like VB v6, VB .Net or VB .Net 2003

## Sub-module 8: Adding Additional Event Procedures

Duration: 6 Hours

| Competence(s) | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• adds a control that activates the message button upon clicking to display the word "Hello world"<br>• clears the text by clicking the clear button. | • Initial Run Time Window<br>• The Run Time Window after the message button is clicked | • Guide learners on how to add the "Hello World" and activate the clear button to invoke the btn Clear_ Click() procedure. |

### Assessment Strategy

Assign learners a task to write a Program that Calculates Profit of a business.

### Teaching and Learning Resources

- Sample programs with Message Box operators
- Computers
- Overhead projectors
- Internet
- Software resources like VB v6, VB .Net or VB .Net 2003

### Suggested References

Liew V. K. 2006: Visual Basic 6 Made Easy: (A Complete Tutorial for Beginners). Booksurge, LLC.

Introduction to visual basic. Net
Http://Www.Jblearning.Com/Samples/0763724785/Ch02_Bronson.Pdf

Alessandro, D. S. (2016). Visual Basic 2015 Unleashed. 1st edition. Pearson Education, Inco.

Schneider, D. I. (2003). Introduction to Programming with Visual Basic.NET. 5th edn: Prentice Hall.

Prentice Hall (2001). A Programmer's Introduction to Visual Basic.NET. 1st edn: Sams Publishing.

# NCIT222: Basic Computer Maintenance

Duration: 75 hours

## Module Overview

This module introduces learners to the practice of maintaining, troubleshooting, Repairing and assembling computers.

## Learning Outcome

By the end of this module, the learner should be able to maintain the computer system, troubleshoot computer related errors and problems and to carryout computer repair.

## Sub-module 1: Computer Maintenance

Duration: 8 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• maintains computers effectively.<br>• handles and uses maintenance tools effectively.<br>• observes safety, health and environmental during computer maintenance. | • Meaning of maintenance<br>• Types of maintenance<br>• Hardware and Software maintenance<br>• Safety and Preventive maintenance procedures<br>• CRTs and LCD Monitor maintenance.<br>• Safety, health and environmental considerations in computer maintenance. | • Brainstorm the meaning and types of maintenance.<br>• Demonstrate to the learners how system maintenance is done.<br>• Guide learners on the Safety and Preventive maintenance procedure.<br>• Lead demonstrations on CRTs and LCD Monitor maintenance.<br>• Guide learners to discuss and observe the safety, health and environmental considerations in computer maintenance. |

## Assessment Strategy

Assign learners homework to describe the safety precautions to be observed during execution of each maintenance procedure applied to different devices of a computer system.

## Teaching and Learning Resources

- Computers and accessories
- Overhead projectors
- Internet
- Maintenance toolkit, materials and equipment

## Sub-module 2: System Troubleshooting

Duration 17 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• identifies computer related errors.<br>• troubleshoot various computer errors and problems.<br>• fix computer problems.<br>• fix boot/start-up problems of a computer. | • Errors and Problem detection techniques<br>• Computer Error codes and sounds<br>Troubleshooting;<br>• Boot/start-up errors.<br>• Device errors.<br>• Hardware and Software (Operating System) errors.<br>• Connection and Display errors.<br>• Power related problems.<br>• Power On Self-Test (POST) | • Demonstrate to the learners the techniques of identifying computer errors using codes.<br>• Demonstrate to the learners troubleshooting techniques.<br>• Illustrate to the learners on how to fix computer problems.<br>• Demonstrate to the learners on how to configure POST messages. |

## Assessment Strategy

Assign learners a task to identify error codes and describe the error types.

## Teaching and Learning Resources

- Computers and accessories
- Overhead projectors
- Internet
- Maintenance toolkit,
- Working and faulty computers

## Sub-module 3: System Repair

Time: 20 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• repair and upgrade computers.<br>• identify tools required for system repair.<br>• handle tools well.<br>• carryout both hardware and software installations. | • Tools and requirements<br>• Computer system parts/devices<br>• Operating system; installations, repair and upgrade<br>• Hardware; installation and replacement<br>• Software; Installation, Repair and Upgrade | • Display to the learners tools required to perform repairs.<br>• Perform operating system installations and illustrate the steps involved. Task learners to practise.<br>• Perform software and hardware installation while the learners are taking notes on the procedures. |

## Assessment Strategy

Assign learners to install operating system on a computer.

## Teaching and Learning Resources

- Computers and accessories
- Overhead projectors
- Internet
- Maintenance toolkit,
- Operating System,
- CDs/DVDs, Computers,
- CD/DVD drivers,
- Hard disk drives
- Faulty computers

## Sub-module 4: System Assembly

Duration: 18 Hours

| Competence(s) | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• assembles a computer<br>• identifies and installs the motherboard.<br>• install power supply. | • **System casing**; form factor, dimensions, desktop layout, tower layout<br><br>**Motherboard**<br>• Types and components<br>• Form factors and dimensions<br>• Installation and upgrade<br>• Motherboard interface connectors<br>• Expansion slots<br>• Power supply installation | • Show the learners different layouts of the system casing and demonstrate how to set screw holes.<br>• Display different types of motherboards and demonstrate how to install.<br>• Lead a guided discussion on form factors and motherboard components.<br>• Take learners through a step by step guide of installing a power supply. |

## Assessment Strategy

Assign learners to dismantle and mantle a computer, and install and configure a motherboard.

## Teaching and Learning Resources

- Computers and accessories
- Overhead projectors
- Internet
- Faulty computers
- Repair toolkit, motherboards, system casings, power supplies

## Sub-module 5: Secondary Storage Media

Duration: 12 Hours

| Competence(s) | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• uses various storage media devices.<br>• writes data to CDs and DVDs.<br>• performs data backup. | • External Storage; installation, configuration, troubleshooting<br>• Hard disk storage<br>• Flash storage/removable storage; formatting; memory cards.<br>• Obsolete storage media.<br>• Optical storage; writing data to CDs/DVDs.<br>• External storage data backup; methods, types. | • Show learners different external devices and demonstrate how to install any external storage device.<br>• Show learners hard disk drives, flash discs and demonstrate how to format them.<br>• Lead a guided discussion on obsolete storage devices.<br>• Demonstrate how to write CDs/DVDs.<br>• Lead a guided discussion on various optical storage devices.<br>• Illustrate to the learners how to carryout data backup. |

## Assessment Strategy

Assign learners a laboratory activity to configure an external storage media/device and carryout data backup to the external media.

## Teaching and Learning Resources

- Computers and accessories
- Overhead projectors
- Internet
- Hard disks, flash disc, and memory cards
- CDs/DVDs, CD/DVD writer, Burning Software such as Nero etc.
- Backup drives

## Suggested References

Basic Computer maintenance. https://www.computer-pdf.com/architecture/710-tutorial-basic-computer-maintenance.html

Computer Basics. https://www.computer-pdf.com/other/5-tutorial-programme-computer-basics-tutorial.html

Computer Architecture. https://www.computer-pdf.com/architecture/75-tutorial-programme-computer-architecture.html

Jean, A. (2016). CompTIA A+ Guide to IT Technical Support + Lab Manual. 9th edn: Programme Technology Ptr.

Mike, M. (2007). Guide to Managing and Troubleshooting PCs. 2nd edn: New York, McGraw-Hill, Inc.

Mike, M. (2016). Managing and Troubleshooting PCs. 5th edn: McGraw-Hill Education.

# NCKS223: Basic Kiswahili

Duration: 60Hours

## Module Overview

This module introduces the learner to the basic Kiswahili used in the industry and by the general public to carry out daily business. It also enables the learner to carry out his/her profession in any part of East Africa where Kiswahili is the major language of communication.

## Learning Outcome

By the end of the module the learner should be able to seek help on ICT matters in Kiswahili.

## Sub-module 1: Introduction to Kiswahili

Duration: 2 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner acknowledges the importance of learning and using Kiswahili language. | • Origin and spread of Kiswahili<br>• Importance of Kiswahili to Ugandans and other East African countries | • Take learners through the origin of Kiswahili in East Africa.<br>• Lead a discussion on the importance of Kiswahili to the learner of ICT. |

## Assessment Strategy

Assess learners on the importance of learning Kiswahili in the context of an ICT Specialist.

## Teaching and Learning Resources

- Computers
- Overhead projector
- Internet

## Sub-module 2: Polite Language

Duration: 18 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• greets peers and elders in Kiswahili.<br>• names places and people in their capacities.<br>• appreciates others by saying `thank you' and `well-done' in Kiswahili. | • Greetings to peers, age mates, parents, elderly and supervisors<br>• Salutations at different times of the day<br>• Appreciation and saying `thank you' for work done, gifts, food and so on<br>• Asking for directions, assistance and food and so on<br>• Names of places, like schools, hospitals, markets, garages, roads, airports, water wells, forests, villages, towns, sites, hills<br>• Names of people and professional titles like technicians, nurses, messengers, watchmen, drivers, doctors, teachers, learners | • Lead a guided discussion on the correct use of Kiswahili in greeting peers, elders and supervisors.<br>• Together with learners discuss the use of `thank you', `welcome' and `sorry' in Kiswahili and task learners to practice using Kiswahili in and outside the class.<br>• Using illustrations, lead a guided discussion on giving directions such as move forward, north, left, east, south, west and right hand side in Kiswahili. |

### Assessment Strategy

Ask learners to:

- greet peers, elders and supervisors.
- name places and people in their capacities.

### Teaching and Learning Resources

- The Internet
- Documentaries
- Charts
- Photographs/pictures

## Sub-module 3: Comprehension

Duration: 10 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner :<br>• counts numbers 0 - 1000000 in Kiswahili.<br>• identifies and names the parts of the human body in Kiswahili. | • Vowels a e i o u<br>• Consonants b, ch, d, dh, f, g, gh, h, j, k, l, m, n, ng, ny, p, r, s, sh, t, th, v, w, y, z.<br>• Counting and numbers 0-9, 10-1000000<br>• Daily and common activities and sayings, welcome, have a seat, thank you, wish you well, sorry<br>• Parts of the human body like head, legs. | • Illustrate on the vowels used in Kiswahili and lead a guided discussion on their application.<br>• Lead a guided discussion on the application of the consonants used in Kiswahili.<br>• Guide learners to count numbers in Kiswahili 0-1000000.<br>• Lead a guided discussion on the daily and common activities and word meanings in Kiswahili. |
| **Competences** | **Content** | **Teaching and Learning Strategies** |
| The learner acknowledges the importance of learning and using Kiswahili language. | • Origin and spread of Kiswahili<br>• Importance of Kiswahili to Ugandans and other East African countries | • Take learners through the origin of Kiswahili in East Africa.<br>• Lead a discussion on the importance of Kiswahili to a learner of ICT. |

## Assessment Strategy

Task learners to write numbers in Kiswahili.

## Teaching and Learning Resources

- The internet
- Kiswahili dictionary

## Sub-module 4: General Vocabulary

Duration: 10 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• names domestic animals, birds and insects in Kiswahili.<br>• mentions the days of the week, names the months of the year and tells the correct dates. | • Names of domestic animals like goats, sheep, cows, pigs, rabbits, dogs, cats<br>• Names of domestic birds like ducks, turkeys, hens,<br>• Names of insects like mosquitoes, flies cockroaches<br>• Month in a year, days of the week, dates and telling time<br>• Names of objects like doors, windows<br>• Common usage of Kiswahili, home and garden activities<br>• Common mistakes to be avoided | • Guide learners to discuss on the names of domestic animals, birds and insects in the environment.<br>• With the help of the calendar guide to name on the days of the week, months of the year and the dates of the months.<br>• Lead a guided discussion on the common mistakes to be avoided in Kiswahili.<br>• Guide learners to identify and name the objects and activities in the environment. |

### Assessment Strategy

Ask learners to name in Kiswahili different objects in the environment.

### Teaching and Learning Resource

- Swahili dictionary
- Google translate

## Sub-module 5: Professional Related Vocabulary

Duration: 06 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner :<br>• identifies and names the tools, materials, and equipment used in ICT.<br>• refers to officers in ICT by their titles.<br>• describes the tasks performed by different ICT officials. | • Names of tools, materials, and equipment used ICT<br>• Titles of officers in ICT<br>• Tasks performed by ICT officers | • Guide learners to identify and name the tools, materials, and equipment used in ICT.<br>• Ask learners to find out the Swahili titles of people who work in ICT.<br>• Discuss with learners the tasks performed by different ICT officers. |

### Assessment Strategy

Assign the learner to write the titles and tasks performed by an ICT technician.

### Teaching and Learning Resource

- The Internet
- Kiswahili dictionary

## Sub-module 6: Customer Care and Language

Duration: 10 Hours

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• applies the terms used in ICT.<br>• expresses confidently in public.<br>• welcomes, offers to assist, and appreciates the assistance provided by others.<br>• advertises the products in Kiswahili.<br>• negotiates for better business terms in ICT. | • Common terminologies used in records.<br>• Public expression (welcoming, asking, thanking)<br>• Providing the available information<br>• Persuasive language<br>• Advertising of products<br>• Negotiating for better terms | • Pair up learners to role play the application of the common terms used in ICT.<br>• Set up a conversation requiring learners to welcome, ask, and appreciate.<br>• Let learners design adverts in a persuasive language.<br>• Guide learners how to negotiate politely in Kiswahili. |

### Assessment Strategy

Task learners to write and format a Kiswahili advert for any ICT business.

### Teaching and Learning Resources

- The Internet
- Kiswahili dictionary

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# NCIT224: Real Life Project IV

Duration: 60 Hours

## Module Overview

This module enables the learner to demonstrate a summation of all the skills learn in the entire time of study. The learner manages a computer workshop and improves on the website that was started in the previous semester.

## Learning Outcome

By the end of this module the learner should be have demonstrated ability to troubleshoot computer hardware issues.

| Competences | Content | Teaching and Learning Strategies |
|---|---|---|
| The learner:<br>• repairs and maintains computers.<br>• typesets documents.<br>• sets up and manages a software or stationary kiosk.<br>• installs software.<br>• prints and photocopies documents.<br>• mobilises more funds for the business. | • Identification of new customers to the business<br>• Utilisation of the available to add value to products.<br>• Mobilisation of funds for the business | • Lead a guided discussion on how to identify potential customers.<br>• Guide learners on how to utilize the available resources to add value to their products.<br>• Guide a discussion on how to mobilise more funds for the business.<br>• Guide the learner on various ways of evaluating a business. |

## Sample Projects

- Creating three small programs using Visual Basic Application
- Starting and managing a small scale computer repair workshop
- Improving and completing website development by adding web pages such as (Home page, Programs/Services offered, Contact Us, About Us and Gallery)
- Develop a new website for an institution of training or a parastatal (Home page, Programs/services offered, Contact Us, About Us and Gallery)

## Teaching and Learning Resources

- Computers
- Sample project reports
- Electronics systems
- Windows OS
- Sample workshop reports
- Repair toolkit

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Project Computer Sales and Service Centre (2):

https://www.scribd.com/doc/94974615/Project-Computer-Sales-and-Service-Centre-2

# NCIT225: Industrial Training

Duration: 288 Hours (6 weeks)

## Module Overview

This module provides an opportunity to the learner in matching the knowledge and skills acquired in at the institution of training and place of employment.

## Learning Outcome

Ability to apply ICT solutions when solving end-user need.

| Competences | Content | Teaching and Learning Strategy |
|---|---|---|
| The learner demonstrates ability to use a computer to solve general user needs. | • Using MS office applications to input and printout information<br>• Retouch photos using graphic application<br>• Applying safety measures when handling ICT equipment<br>• Demonstrating effective communication skills<br>• Designing a website<br>• Coding simple programs | Use the industrial training guidelines. |

## Assessment Strategy

i) Field supervisors scores the candidate according to the attached industrial training guidelines

ii) Academic supervisor visits the trainee in the field to observe the trainee performance and interviews the Field supervisor about the trainee's performance.

## Teaching and Learning Resources

- Telephone contact/address of the trainees and place of industrial training
- Assessment Forms/log books
- Transport facilitation to the field

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# Appendices

## Appendix I: Industrial Training Guidelines

The guidelines below should be followed during Industrial Training:

1) It starts at the end of the academic year.
2) It takes a minimum period of 6 weeks.
3) It is carried out at the world of work located in any part of Uganda including the training institutions.
4) The training institution has the duty of:
5) Budgeting for industrial training.
6) Obtaining money from government for government sponsored learners.
7) Explaining to the learners what they are expected to do.
8) Finding placements for industrial training.
9) Posting learners to industrial training.
10) Supervising and assessing learners during industrial training.

**Supervision**

There should be a world of work or field or industry supervisor and an academic supervisor from the training institution.

The academic supervisor visits the attachment site or industry at least once, and interacts with both the learner and field supervisor.

**Assessment**

Assessment marks should be categorised as follows:

- Assessment by field supervisor 50%
- Assessment by academic supervisor 30%
- Field attachment report 20%

All the above assessment categories must be carried out for one to complete Industrial Training. The marks awarded by each category must be verified by UBTEB.

## Appendix II: Industrial Training Assessment Form for Field or Onsite Supervisor

Name of Institution..... Name of Industry .....
Name of learner ..... Signature.....
Registration Number..... Name of supervisor.....
Signature..... Date.....

| | Area of Assessment | Marks | Score | Area of Improvement |
|---|---|---|---|---|
| 1 | Attendance (% age of days and times within the days present) | 5 | | |
| 2 | Work Performance Involvement | 30 | | |
| | Co-operation with other staff | 5 | | |
| | General ability to use various equipment, machines or plant in the industry/ company/organisation | 10 | | |
| | Flexibility-willingness to learn from various sections in the industry/ company/organisation | 7 | | |
| | Job planning | 8 | | |
| 3 | **Initiative and Innovations** | **15** | | |
| | Problem-solving | 8 | | |
| | New ideas on improvement for efficiency of performance or operations | 7 | | |
| 4 | **Time Management** | 5 | | |
| | Reporting on time | 1 | | |
| | Leaving at specified break-off or stoppage time | 1 | | |
| | Meeting deadlines on assignments given by supervisors or instructors | 3 | | |

| | | | | |
|---|---|---|---|---|
| 5 | **Discipline and Safety Observation** | **15** | | |
| | Use of right equipment for right job | 4 | | |
| | Obeying instructions | 4 | | |
| | Proper handling of equipment and or materials | 2 | | |
| | Ability to practise safety measures in the workplace | 3 | | |
| | Knowledge of first aid procedures in case of accident | 2 | | |
| 6 | **Practical Skills** | **20** | | |
| | Ability to put into practice training instructions from instructors or supervisors | 4 | | |
| | Ability to relate theoretical knowledge with practical applications | 4 | | |
| | Proper use of manuals and interpretation of drawings | 4 | | |
| | Ability to carry out troubleshooting on equipment, (put right mistake in work or finishing) | 4 | | |
| | Ability to service and repair equipment (clean and maintain tools and workplace) | 4 | | |
| G | General Remarks (other assessment at discretion of assessor) | 5 | | |

The assessment shall be carried out as indicated in each area and then the total mark obtained is computed to 50%.

## Appendix III: Industrial Training Assessment Form for Academic Supervisor

Name of Institution..... Name of Industry .....
Name of learner ..... Signature.....
Registration Number..... Name of supervisor.....
Signature..... Date.....

| No | Area of Assessment | Marks | Score | Area of Improvement |
|---|---|---|---|---|
| 1 | Attendance (Was the learner at his work place?) | 5 | | |
| 2 | Understanding of tasks | 21 | | |
| | Did the learner provide weekly summary of work performed? | 2 | | |
| | How did the learner describe the tasks performed? | 4 | | |
| | How was the learner able to explain why tasks were being done in a particular way? | 3 | | |
| | How did the learner explain problems experienced when carrying out the work and how they were solved? | 3 | | |
| | How did the learner explain the knowledge and skills acquired at the institute that enabled him to perform? | 2 | | |
| | How did the learner describe the new knowledge and skills gained? | 3 | | |
| | How did the learner explain his relationship with his co-workers and supervisors and how he plans to improve or maintain it? | 2 | | |
| | How did the learner relate the Industrial | 2 | | |

| | | | | |
|---|---|---|---|---|
| | Training tasks to his training as a technician? | | | |
| 3 | General Remarks (Other assessment at discretion of examiner) | 4 | | |
| **Total mark** | | **30** | | |

The assessment shall be carried out as indicated in each area and then the total mark obtained is computed to 30%.

## Appendix IV: Field Attachment Report and Guide for Industrial Training

The report should be written in English and contain the following to be assessed as shown:

| No | Contents | Maximum Score |
|---|---|---|
| 1 | **Cover page:**<br>Name of Institution<br>Name of Department<br>Name of learner and year of study<br>Place of Industrial Training<br>Period of Industrial Training e.g. July- September 1510<br>Academic and Field Supervisor's signatures | 1 mark |
| 2 | **Acknowledgements**<br>Acknowledge all assistance during field training<br>Acknowledge assistance during report writing | 0.5 marks |
| 3 | **Executive summary or abstract**<br>To include statement of the most practical work carried out<br>Challenges<br>Conclusions | 2 marks |
| 4 | **Table of contents**<br>To show the content of the report and page numbers where they first occur | 0.5 marks |
| 5 | **List of figures**<br>All figures in the report must have a number and a caption<br>Figures must be numbered according to the chapters where they occur for example; Figure 4.1, to refer to first Figure in chapter 4<br>The pages where the figures occur must be shown in the list of figures | 0.5 marks |
| 6 | **List of tables**<br>All tables in the report must have a number and a header<br>Tables must be numbered according to the chapters where they occur for example; Table 2.1, to refer to first table in Chapter 2<br>The pages where the tables occur must be shown in the list of tables | 0.5 marks |
| 7 | **List of acronyms or abbreviations**<br>Acronyms used should be given in alphabetical order with their full meaning shown | 0.5 marks |
| 8 | **Introduction** | 2 Marks |

| | | |
|---|---|---|
| | Location and description of place of field attachment<br>Objectives of field attachment<br>Structure, organisation<br>Tasks carried out by the place attached to e.g. if District Local Government describe its role in society | |
| 9 | **Main body of the report**<br>Description of work carried out<br>Duties and responsibilities assigned and how they were carried out<br>New knowledge and skills gained<br>Relationship with other staff and supervisor<br>Problems experienced and how they were handled | 8 marks |
| 10 | **Conclusions**<br>A brief summary of knowledge gained as outlined in the objectives | 1mark |
| 11 | **Recommendations**<br>For improving Industrial Training, usually derived from problems experienced<br>For improvement of work output at the place of work (this is included if allowed by the field supervisor) | 1.5 marks |
| 12 | **References**<br>Design standards and guidelines used during training<br>Books and internet material<br>Harvard style of referencing must be used for example Kyalikisa R (1510), "Effect of window net on the reduction of Malaria," Journal Health Construction, Vol 17, Pg 123-127 | 1 mark |
| 13 | Appendices<br>Drawings<br>Photographs, etc | 1 mark |
| Total mark | | 20 marks |

## Appendix V: Tools and Equipment for the Programme

| S/N | EQUIPMENT |
|---|---|
| 1. | circuit brakers & accessories |
| 2. | circuit protectors |
| 3. | fuse holders |
| 4. | fuse |
| 5. | surge supressors |
| 6. | thermistor |
| 7. | thyristors |
| 8. | varistors |
| 9. | audio & video connectors |
| 10. | board to board & mezzanine connectors |
| 11. | card edge connectors |
| 12. | fibre optic connectors |
| 13. | junction systems |
| 14. | memory connectors |
| 15. | RF interconnectors |
| 16. | USB connectors |
| 17. | hardware components |
| 18. | computers-assorted |
| 19. | printers |
| 20. | relays |
| 21. | switches- assorted |
| 22. | analogue digital development tools |
| 23. | communication development tools |

| S/N | EQUIPMENT |
|---|---|
| 24. | development software |
| 25. | display development tools |
| 26. | processor development kit |
| 27. | fibre optic development tools |
| 28. | memory ICS |
| 29. | memory modules |
| 30. | integrated circuits-assorted |
| 31. | wireless & RF semiconductors-assorted |
| 32. | fibre optic testing equipment- |
| 33. | LAN/telecom/cable testor |
| 34. | oscilloscopes |
| 35. | digital measuring equipment-assorted |
| 36. | cable assemblies |
| 37. | coaxial cables |
| 38. | FFC/FPC jumper cables |
| 39. | fibre optic cable |
| 40. | flat cables |
| 41. | hook-up wire |
| 42. | mult-conductor and paired cable |
| 43. | logit circuits |
| 44. | circuit boards |
| 45. | multmeters/voltmeters |
| 46. | electronic repair toolkit |

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