AFRICAN COLLEGE OF COMMERCE

P.O. BOX 301 KABALE – UGANDA

THE CURRICULUM FOR THE CERTIFICATE IN ELECTRICAL INSTALATION (CEI)

THE STRUCTURE, REGULATIONS AND SYLLABUS

YEAR 2014

VISION

To be a leading Institution in Business, Technical and Vocational Training in Africa

MISSION

To establish a competence - based training that equips the learners with skills relevant to employment and economic growth

CORE VALUES

1. **Competence based training for competent and skilled graduates;**

2. **Integrity based on honesty and ethics;**

3. **Hard work, dedication, and achievement of results.**

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THE HISTORY OF

AFRICAN COLLEGE OF COMMERCE (ACC)

African College of Commerce is an Educational Institution majoring in Business Technical and Vocational training programmes. Below is the historical background of the institution.

1986: 14th April, Commissioned as a Business Education Institution.

1986: June, Registered and recognised by the Ministry of Education.

1990: Held the first Graduation Ceremony;

1992: Introduced Computer Science Courses;

1994: Granted Examinations Centre U62 by the Uganda National Examinations Board,

1998: Purchased land on which to construct the Main Campus

2003: Affiliated to Makerere University Business School (MUBS)

2004: Shifted from rented building in Kabale town centre to Kekubo cell a kilometre away in our own buildings in an area conducive for learning

2005: Received donation from the Federal Republic of Germany in form of buildings, computers, text books and Human Resource Development.

2006: Established ICT Centers in Kabale and Kanungu Districts with the assistance of the Uganda Communications Commission.

2007: Worn a BRONZE Medal from the Federation of Uganda Employers for being the third best employer in Uganda for the year 2006.

2008: Accredited by the National Council for Higher Education as a recognized Institution of Higher learning in Uganda:

2010: Re branding African College of Commerce. Introduced more Technical and Vocational programmes and short courses.

2011: April 16th 2011, Cerebrate Silver Jubilee **1986 to 2011**. Penetrated the Rwanda, Congo, Tanzania Burundi and Kenya

2012: Transformed into a fully fledged **Polytechnic.** Engaged all the training programmes into innovation and production units for products and services. Concretised the hands on training and competence based approach.

2014: Affiliating to Kyambogo University for diploma programmes and in particular the Diploma in Instructor and Technical Teacher Education DITTE, under Skilling Uganda Strategy.

TABLE OF CONTENTS

PART B: DETAILED COURSE CONTENT

PART A: GENERAL REGULATIONS

1.0 LIST OF ACRONYMS

CEI	Certificate in Electrical Installation
CGPA	Cumulative Grade Point Average
CH	Contact Hours
CU	Credit Units
GP	Grade Point
GPA	Grade Point Average
LH	Lecture Hours
NP	Normal Progress
PH	Practical Hours
ATPs	Assessment Training Packages
ACC	African College of Commerce
ACCEB	African College of Commerce Academic Board

2.0 TITLE

The title of the Programme is **Certificate in Electrical Installation**

3.0 INTRODUCTION.

The Certificate in Electrical Installation is a two year academic programme aimed at providing students with electrical installation and repair skills that are required in governmental and non-governmental establishments.

3.1 Rationale:

The building and Construction industry is growing rapidly in Uganda and East Africa at large. This require the skills of competently trained personnel in the fields of Electrical installation. This programmes therefore intends to produce competent Electricians to meet the growing demand in building and construction industry.

3.2 Target Group.

The target group is the Senior Four leavers and UJC certificate holders in related fields.

4.0 OBJECTIVES OF THE PROGRAMME

The programme is intended to train and equip learners with knowledge and skills in electrical installation and maintenance.

5.0 PROGRAMME OUTCOMES

The graduate of Electrical Installation should competently apply skills and knowledge of electrical installation, repair, maintenance, site inspection, trouble shooting and general precautions including safety.

6.0. JOB TITLES FOR CEI GRADUATES

- Maintenance Technicians
- Power/Boiler Technician
- Site Supervisors
- Electrical Contractors
- Electrical Appliance Technicians

7.0 ORGANISATIONS THAT EMPLOY CEI GRADUATES

- Manufacturing/Processing Industries in private and public sector
- Service sectors like railway and military engineering services
- Construction companies
- Power generation, transmission and construction projects
- Self employment in fabrication of electrical equipments
- Instructors in technical institutions

8.0. NATURE OF COURSES

All the courses in this programme are compulsory.

9.0 ADMISSION REQUIREMENTS

The minimum entry requirement to the Certificate in Electrical Installation is:

a) Uganda Certificate of Education (UCE) with at least 3 passes in Science subjects;

b) Qualifications equivalent to Uganda Certificate of Education (UCE) as shall be determined by the National Council in consultation with the Uganda National Examinations Board;

10.0 DURATION OF THE PROGRAMME

The minimum period to complete the Certificate in Electrical Installation is two years and the maximum period is four years. Failure to complete the program in four/two years, the student shall be required to repeat the whole program i.e. forfeit the already passed program and start afresh.

11.0 MODE OF DELIVERY AND INSTRUCTIONAL STRATEGIES

Mode of delivery and instructional strategies will be by the following:

11.1 Lectures for theory
11.2 Practical work in form of Projects
11.3 Field work through industrial training and Study tours
11.4 Class discussions and group presentations
11.5 Demonstrations

12.0 STUDY MATERIALS AND INFRASTRUCTURE

12.1 Institutional Infrastructure

The institution will use the existing facilities on ACC Campus. The institution has sufficient infrastructure to facilitate the teaching and learning process e.g. furniture, lecture rooms, workshops, library, computer laboratories and a resource room.

12.2 Study Facilities

The Faculty of Engineering will use the existing study facilities on ACC Campus. The institution has sufficient study facilities to facilitate the teaching and learning process e.g. relevant materials and equipment to the programme, computers, handouts, textbooks and other materials from individual lecturers, journals and related publications, internet connectivity in the computer laboratories, library with wireless connection, audio visual materials, relevant software programme, source documents, archival records, government policy papers, Government Acts and Statutes, research and innovations by lecturers and students.

13.0 HUMAN RESOURCE

The Faculty of Engineering has well qualified and experienced teaching and technical staff managing the Certificate and Diploma Programmes. The academic and technical staff to support the Certificate in Electrical Installation will be drawn from the programmes under the Faculty as listed on page 65 of this curriculum

14.0 PROGRAMME STRUCTURE

14.1 YEAR ONE SEMESTER ONE

Code	Name	LH	PH	CH	CU
CEI 1101	Electrical Installation Regulations & Practice I	30	90	75	5
CEI 1102	Electrical Principles I	45	30	60	4
CEI 1103	Mathematics I	40	40	60	4
CEI 1104	Basic Communication Skills	40	40	60	4
CEI 1105	Computer Applications I	20	50	45	3
CEI 1106	Electrical Installation Project I	10	130	75	5
	Total	**185**	**380**	**375**	**25**

14.2 YEAR ONE SEMESTER TWO

Code	Name	LH	PH	CH	CU
CEI 1201	Electrical Installation Regulations & Practice II	30	90	75	5
CEI 1202	Electrical Principles II	45	30	60	4
CEI 1203	Mathematics II	40	40	60	4
CEI 1204	Solar Energy Installation	20	80	60	4
CEI 1205	Computer Applications II	20	50	45	3
CEI 1206	Electrical Installation Project II	10	130	75	5
CEI 1207	Fieldwork	10	130	75	5
	Total	**175**	**550**	**450**	**30**

14.3 YEAR TWO SEMESTER ONE

Code	Name	LH	PH	CH	CU
CEI 2101	Electrical Installation Regulations & Practice III	30	90	75	5
CEI 2102	Electrical Principles III	45	30	60	4
CEI 2103	Electrical Designing, Planning & Drawing I	30	60	60	4
CEI 2104	Engineering Software	20	50	45	3
CEI 2105	Electrical Installation Project III	10	130	75	5
	Total	**135**	**360**	**315**	**21**

14.4 YEAR TWO SEMESTER TWO

Code	Name	LH	PH	CH	CU
CEI 2201	Electrical Installation Regulations & Practice IV	30	90	75	5
CEI 2202	Electrical Principles IV	45	30	60	4
CEI 2203	Electrical Designing, Planning & Drawing II	30	60	60	4
CEI 2204	Entrepreneurship Skills	50	20	60	4
CEI 2205	Electrical Installation Project IV	10	130	75	5
	Total	**165**	**330**	**330**	**22**

15.0 PROGRAMME LOAD

To qualify for the award of the Certificate in Electrical Installation, a candidate must obtain 98 credit units distributed as follows:

YEAR ONE	SEMESTER I	25
	SEMESTER II	30
YEAR TWO	SEMESTER I	21
	SEMESTER II	22
TOTAL		**98**

16.0 CURRICULUM

The Curriculum for Diploma in Electrical Installation will be prepared by the African College of Commerce Academic Board (ACCAB) and accredited by the National Council for Higher Education (NCHE)

17.0 EXAMINATION REGULATIONS

The examination rules and regulations for a Certificate in Electrical Installation will be set by African College of Commerce Academic Board (ACCAB)

18.0 ADMISSIONS TO THE PROGRAMME

Admission into the programme will close at the end of the third full week of each semester;

19.0 PROGRESSION

Progression of a student will be classified as normal, Probational or Retaking or discontinuation.

19.1 Normal progression

Normal progression occurs when a student passes each course taken with a minimum grade point of 2.00

19.2 Probationary progress

This is a warning stage and it occurs when a student;

(i) Fails a course unit

(ii) Has GPA or CGPA of less than 2.00

19.3 Stay put

A student who fails more than a half of the total number of courses in a semester shall be required to stay on that semester until the failed courses are cleared.

When the GPA of a student goes up in the following semester, the probation is removed.

19.4 Retaking

A student will retake any course when it is next offered, to pass or to improve performance. A student shall retake in a course only two times.

19.5 Discontinuation

A student is discontinued when he or she has:

(i) Received three (3) consecutive probations in the same course unit.

(ii) Received a CGPA of less than 2.00 for three consecutive probations.

(iii) Failed to present him/her-self for final examinations without giving sufficient reasons.

(iv) Over stayed on the programme for a period of more than four years

20.0 FINAL EXAMINATION PAPER FORMAT

20.1 YEAR ONE SEMESTER ONE

PAPER NAME AND CODE	EXAMINATION FORMAT
CEI 1101 Electrical Installations Regulations and Practice I CEI 1102 Electrical Principles I CEI 1103 Mathematics I CEI 1104 Basic Communication Skills	Each paper will consist of seven questions and the candidate will be required to answer at least five. All questions will carry equal marks. The Students should be assessed on memory, understanding, application, analysis, synthesis and evaluation. The total duration of the examination will be three hours
CEI 1105 Computer Applications I	The paper will consist of three exercises and the candidate will be required to answer all. The total duration of the examination will be two hours.
CEI 1106 Electrical Installation Project I	This paper will consist of continuous assessment marks. African College of Commerce will always invite an external field practicing expert to verify the authenticity of the awarded marks from the completed projects on the ground and by making candidates participation through presentations of the projects completed in the respective semester The total duration of the examination will be during 15 weeks of teaching

20.2 YEAR ONE SEMESTER TWO

PAPER NAME AND CODE	EXAMINATION FORMAT
CEI 1201 Electrical Installation Regulations and practice II CEI 1202 Electrical Principles II CEI 1203 Mathematics II CEI 1204 Solar Energy Installation	Each paper will consist of **seven** questions and the candidate will be required to answer **at least five**. All questions will carry equal marks. The Students should be assessed on memory, Understanding, application, analysis, synthesis and evaluation. The total duration of the examination will be three hours
CEI 1105 Computer Applications II	The paper will consist of three exercises and the candidate will be required to answer all. The total duration of the examination will be two hours.
CEI 1206 DEE Project II	This paper will consist of continuous assessment marks. African College of Commerce will always invite an external field practicing expert to verify the authenticity of the awarded marks from the completed projects on the ground and by making candidates participation through presentations of the projects completed in the respective semester. The total duration of the examination will be during 15 weeks of teaching.
CEI 1207 Fieldwork	Industrial Training will take place in recess. An Assessment Supervision Sheet or Form will be used to determine the practical performance of students at the training centres.

20.3 YEAR TWO SEMESTER ONE

PAPER NAME AND CODE	EXAMINATION FORMAT
CEI 2101 Electrical Installation, Regulations and practice III CEI 2102 Electrical Principles III CEI 2103 Electrical Design, Planning & Drawing I	Each paper will consist of **seven** questions and the candidate will be required to answer **at least five**. All questions will carry equal marks. The Students should be assessed on memory, Understanding, application, analysis, synthesis and evaluation. The total duration of the examination will be three hours
CEI 2104 Engineering Software	This paper will consist of one practical section. It will consist of two practical questions and a candidate will be required to answer at least one questions. Section B will consist of three practical questions and a candidate will be required to answer at least two questions. The duration of the this practical examination shall be five hours
CEI2105 Electrical Installation Project III	This paper will consist of continuous assessment marks. African College of Commerce will always invite an external field practicing expert to verify the authenticity of the awarded marks from the completed projects on the ground and by making candidates participation through presentations of the projects completed in the respective semester The total duration of the examination will be during 15 weeks of teaching.

20.4 YEAR TWO SEMESTER TWO

PAPER NAME AND CODE	EXAMINATION FORMAT
CEI 2201Electrical Installations, Regulations and practice IV CEI 2202 Electrical Principles IV CEI 2203 Electrical Design, Planning and Drawing II CEI 2204 Entrepreneurship	The paper will consist of **seven** questions and the candidate will be required to answer at least **five**. All questions will carry equal marks. The Students should be assessed on memory, Understanding, application, analysis, synthesis and evaluation. The total duration of the examination will be three hours
CEI2205 Electrical Installation Project IV	This paper will consist of continuous assessment marks. African College of Commerce will always invite an external field practicing expert to verify the authenticity of the awarded marks from the completed projects on the ground and by making candidates participation through presentations of the projects completed in the respective semester The total duration of the examination will be during 15 weeks of teaching.

21 .0 ASSESSMENTS AND GRADING

21.1 Theory Assessment

21.1.1	Continuous Course Work	
	21.1.1.1 Course work 1	10%
	21.1.1.2 Course work 2	10%
	21.1.1.3 Course work 3	10%
	Total	**30%**
21.1.2	End of Semester Examination	**70%**
	Total	**100%**

21.2 Project Work

21.2.1	Project Assessment 1	20%
21.2.2	Project Assessment 2	20%
21.2.3	Student's Personal Innovation	20%
21.2.4	Project Assessment 4	40%
	Total	**100%**

21.3 Fieldwork

21.3.1	Industrial Training	70%
21.3.1	Field Tours	30%
	Total	**100%**

21.4 Assessment Training Packages (ATPs)

Each student will be assigned an Assessment Training Package. This will record the student's academic progression. This will include assessment areas, grades obtained from course works, project work, field work and final examination.

21.5 Grading courses

Each course unit will be graded out of a maximum of one hundred (100) marks and assigned grade point as follows

MARKS (%)	GRADE POINTS
80-100	5.00
75-79	4.50
70-74	4.00
65-69	3.50
60-64	3.00
55-59	2.50
50-54	2.00
Below 50	0.00

The course pass mark is 50% which is Grade Point 2.0.
No credit unit will be awarded for any course in which a student fails.

21.6 Scaling

All the grades will be scaled down to 100%

22.0 AWARDS AND CLASSIFICATION

22.1 Awards

A successful candidate will be awarded the Certificate in Electrical Installation of African College of Commerce (ACC)

22.2 Grade Point Average (GPA)

A grade point average is mark calculated to determine the final award. To arrive at a grade point average, the following steps are taken.

a. Multiply the Grade Point by the Credit Unit to get a Weighted Score of a Course;
b. Add together the weighted scores for all courses taken up to that time to get **total weighted score(TW);**
c. Add the Credit Units for each course to get the **Total Credit Units (TCUs);**
d. Divide the total weighed scores by the total number of credit units taken up to that time to get **grade point average (GPA). TWs/TCUs =GPA.**

The letter grades shall be used for Grade Point Averages (GPAs) as follows:

A	B+	B	C	D
5	4	3	2	1

22.3 Cumulative Grade Point Average (CGPA)

This is determined by dividing total accumulated weighted scores (TWs) by the total accumulated credit units (TCUs) up to a particular time.

22.4 Classification of Final Awards

CLASS	FINAL CGPA	LETTER GRADE
First Class	4.4 – 5.0	A
Second Class Upper Division	4.0 – 4.3	B+
Second Class Lower Division	3.0 – 3.9	B
Pass	2.0 – 2.9	C
Fail	1 - 1.9	D

PART B: DETAILED COURSE CONTENT

23.0 YEAR ONE SEMESTER ONE

23.1 ELECTRICAL INSTALLATIONS REGULATIONS AND PRACTICE I

COURSE CODE CEI 1101

CREDIT UNITS 05

CONTACT HOURS 75

COURSE DESCRIPTION
This course introduces students to electrical workshop rules and regulations.

LEARNING OUTCOMES
Students should be able to identify electrical symbols and apply in real projects, Install consumer supply unit and application for the acquired skills in electrical work.

OBJECTIVES OF THE COURSE
By the end of this course students should be able to:

1. Demonstrate the understanding of electrical symbols and electrical rules and Regulations.
2. Identify different types of supply systems
3. Differentiate types of circuits & Install consumer supply unit
4. Differentiate different types of cables and determine their current carrying capacity.

COURSE CONTENT

CHAPTER ONE
1.0 Introduction to Regulations for IEE electrical equipment of building
1.1 Definitions
1.2 Electrical symbols
1.3 IEE Regulations

CHAPTER TWO
2.0 Supply Systems
2.1 Standard voltages
2.2 Variation of voltage and frequency
2.3 Links in earthed neutral
2.4 Two wire direct current
2.5 Three phase direct current
2.6 Three phase four wire distributions
2.7 Single phase 2-wire distribution
2.8 Generation, Transmission and distribution of power

CHAPTER THREE

3.0 Consumer Supplies

3.1 Internal distribution board
3.2 Medium voltage precautions (safety and workshop)
3.3 Two meter rule
3.4 IEE regulations for control gears
3.5 Arrangement of final sub-circuit
3.6 Radial and ring circuits
3.7 Lighting circuits
3.8 Temporally installation
3.9 Domestic intake and industrial intake

CHAPTER FOUR

4.0 Conductors and Cables

4.1 Cables
4.2 Conductors
4.3 Mechanical Protection
4.4 Current carrying capacity
4.5 General regulations for Cables
4.6 Voltage drop and use of IEE tables
4.7 Calculation of voltage drop using Ohm's law
4.8 Joints and jointing
4.9 Soldering
4.10 Types of joints

CHAPTER FIVE

5.0 **Introduction**

5.1 Definition
5.2 Electrical symbols
5.3 Electrical terms
5.4 Safety precautions
5.5 IEE regulations

CHAPTER SIX

6.0 **Accidents in workshop**

6.1 Electrical shocks
6.2 Different current effects
6.3 Causes of accidents
6.4 Methods of rescuing victim
6.5 Workshop procedures

CHAPTER SEVEN

7.0 **Tools**

7.1 Types of tools
7.2 Tool handling
7.3 Maintenance
7.4 Usage of tools
7.5 Storage
7.5 Auto and manual tools

MODE OF DELIVERY

The mode of delivery will include: lecture, hands-on, demonstration, group discussions and presentation.

ASSESSMENT OF THE COURSE

This course unit will be assessed out of 100 marks as follows;

Course work by continuous assessment	30%
Final examination	70%
Total	**100%**

The marks will be converted into Grade points.
There will be the final examination in the last two weeks of the semester.

REFERENCES

1. Basic Electrical installation work Fifth Edition by Trevor Linsley
2. Electrical installation work by A.O Akintante and J.M. Hyde
3 Electrical Installation work Sixth Edition by T.G Francis
4. Electrical installation work Fifth Edition by Thompson
5. IEE Wiring Regulations Explained and Illustrated by Brian Scaddan

23.2 ELECTRICAL PRINCIPLES I

COURSE CODE **CEI 1102**

CREDIT UNITS 0**4**

CONTACT HOURS **60**

COURSE DESCRIPTION
This course introduces students to electrical engineering scientific theories and principles.

LEARNING OUTCOMES
Students should be able to differentiate between conductors and insulators, effects of electric current, what magnetism is and measurement of current.

By the end of this course students should be able to:
1. Define terms & state SI Units
2. Classify cells connections
3. Appreciate the importance of Kirchoff-s laws & their applications
4. Differentiate conductors & insulators

COURSE CONTENT

CHAPTER ONE
1.0 Introduction
1.1 Definition of terms
1.2 International standard units (SI)
1.3 Basic units of length, mass, time, temperature, force, torque and thermal energy

CHAPTER TWO
2.0 Electric circuits
2.1 Conductors and insulators
2.2 Resistance and energy
2.3 Potential difference
2.4 Electromotive force
2.5 Standard cells connection

CHAPTER THREE

3.0 Electric current
3.1 Effects of electric current
3.2 Measurement and direction of electric current
3.3 Amperes and coulombs
3.4 Faraday's Law electrolysis
3.5 Electromechanical equivalent

CHAPTER FOUR
4.0 Electrical resistance
4.1 Series and parallel connections

4.2 Connection of resistors
4.3 Resistivity variation of resistance with temperature
4.4 Temperature coefficient of resistance
4.5 Application of heating effect of currents
4.6 Kirchoff's laws
4.7 System of distribution

CHAPTER FIVE

5.0 Magnetism and Electromagnetism

5.1 Magnetic fields of permanent magnets and of electric current and their application
5.2 Force on conductor carrying current across magnetic field and its application
5.3 Units of magnetic flux density
5.4 Force between cells carrying current

MODE OF DELIVERY

The mode of delivery will include: lecture, hands-on, demonstration, group discussions and presentation.

ASSESSMENT OF THE COURSE

This course unit will be assessed out of 100 marks as follows;

Course work by continuous assessment	30%
Final examination	70%
Total	**100%**

The marks will be converted into Grade points.
There will be the final examination in the last two weeks of the semester.

REFERENCES

1. Principles of Electricity by Morley & Hughes 5th Edition
2. Basic Electrical installation work Fifth Edition by Trevor Linsley
3. Electrical installation work by A.O Akintante and J.M. Hyde
4. Electrical Installation work Sixth Edition by T.G Francis
5. Electrical installation work Fifth Edition by Thompson
6. IEE Wiring Regulations Explained and Illustrated by Brian Scaddan

23.3 MATHEMATICS I

COURSE CODE CEI 1103

CREDIT UNITS 4

CONTACT HOURS 60

COURSE DESCRIPTION
This course introduces students to the foundation of mathematics as applied in electrical installations.

LEARNING OUTCOMES
Students should be able to use mathematical approaches to solve electrical problems.

OBJECTIVES OF THE COURSE
By the end of this course students should be able to:
1. Calculate area and volume of regular and irregular objects
2. Transpose a formula
3. Solve equations
4. Differentiate trigonometrically ratios
5. Appreciate the importance of Pythagoras theorem and its application

COURSE CONTENT

CHAPTER ONE
1.0 Arithmetic
1.1 Decimals
1.2 Fractions
1.3 Squares
1.4 Percentages
1.5 Ratios
1.6 Proportions & square roots

CHAPTER TWO
2.0 Number systems
2.1 Decimal
2.3 Binary
2.4 Octal
2.5 Hexadecimal
2.6 Standard forms & surds

CHAPTER THREE
3.0 Equations
3.1 Solution of linear equations
3.2 Quadratic equations
3.3 Simultaneous equations (simple)
3.4 Transposition of formula & evaluation

CHAPTER FOUR

4.0 Mensuration
4.1 Areas
4.2 Volumes
4.3 Perimeters
4.4 Trapezoidal rule
4.5 Mid ordinate rule
4.6 Simpson's rule

CHAPTER FIVE
5.0 Indices & Logarithms
5.1 Laws of indices
5.2 Rules of logarithms
5.3 Change of base
5.4 Logarithmic equations (exponential)
5.5 Use of Mathematical tables

CHAPTER SIX
6.0 Trignometrical ratios
6.1.1 Sine,
6.1.2 Cosine,
6.1.3 Tangent
6.2 Area of a triangle given the three sides
6.3 Trignometrical reciprocals
6.3.1 Cosecant
6.3.2 Secant
6.3.3 Cotangent

CHAPTER SEVEN
7.0 **Circular Measurements**:
7.1 Angles and their notations, radius, degrees and revolutions.
7.2 Conversion from linear to circular
7.3 Measurements and vice versa
7.4 Angular and linear
7.5 Velocities
7.6 Length of an arc, Length of a chord, area of a sector, area of a segment

CHAPTER EIGTHT
8.0 Sequences & series
8.1 n^{th} term and sum to n terms of an Arithmetic Progression and Geometric Progression

CHAPTER NINE
9.0 Polynomial
9.1 Evaluation by nesting
9.2 Multiplication and division of algebraic expression
9.2.1 Factorization of polynomials with linear factors
9.2.2 The remainder theorem.

CHAPTER TEN
10.0 **Graphics of Equations**
10.1 Introduction to Cartesian coordinate system
10.2 Drawing the graph of a linear equation using ordered pairs

10.3 Determination of gradients/slope of a straight line
10.4 The relation between two gradients of two perpendicular lines
10.5 Equation of a straight line, y = mx + c e.g. Y =2x + 3
10.6 Drawing the graph of a linear equation given
10.6.1 The gradient and y - intercept.
10.6.2 The gradient and one set of coordinates at a point.
10.7 Curve sketching of a graph of any equation e.g. $y = x^2$. The gradient of a curved graph [approximate Method]

MODE OF DELIVERY

The mode of delivery will include: lecture, hands-on, demonstration, group discussions and presentation.

ASSESSMENT OF THE COURSE

This course unit will be assessed out of 100 marks as follows;

Course work by continuous assessment	30%
Final examination	70%
Total	**100%**

The marks will be converted into Grade points.
There will be the final examination in the last two weeks of the semester.

REFERENCES

1. Mathematics for Technicians by Taylor Level II
2. Pure mathematics back house I

23.4 BASIC COMMUNICATION SKILLS

Course code **CEI 1104**

Credit units **04**

Contact hours **60**

COURSE DESCRIPTION
This course introduces students to the different forms of communication; oral, written and non-verbal, enabling students to develop skills of business letter writing, report writing, handling meetings and management of interviews.

LEARNERNING OUTCOMES
This course will impart students with listening, speaking, reading and writing skills

OBJECTIVES OF THE COURSE
By the end of this course, students should be able to:
1. Demonstrate the ability to communicate efficiently and effectively;
2. Understand the meaning of communication and how it relates to other management functions;
3. Acquire writing skills of business letters, memos and minutes of a meeting;
4. Deal with correspondences and other writings at a supervisory level.

COURSE CONTENT

CHAPTER ONE
1. Grammar and vocabulary
1.0 Parts of speech
1.1 Tenses
1.2 Simple and Compound Sentences
1.3 Punctuation
1.4 Direct and Indirect Speech
1.5 Prefixes and suffixes
1.6 Correction of grammatical errors

CHAPTER TWO
2. Comprehension
2.0 Summary writing
2.1 Written and oral deduction of summons from given prose passage
2.2 Diction
2.3 Answering questions about the passage

CHAPTER THREE
3.0 Overview of Communication
3.1 Meaning of communication
3.2 Objectives of communication
3.3 Communication process model
3.4 Types of communication/categories of communication
3.5 Barriers to communication
3.6 Remedies to barriers

CHAPTER FOUR
4.0 Written communication
4.1 Definition
4.2 Advantages and disadvantages
4.3 Business letter writing, types
4.4 Formats
4.5 Parts of the business letter
4.6 Memo writing

CHAPTER FIVE
5.0 Non verbal communication
5.1 Meaning
5.2 Facial expression
5.3 Gestures
5.4 Voice
5.5 Eye contact
5.6 Difference between verbal and non verbal communication
5.7 Problems involved in non verbal communication

CHAPTER SIX
5.0 Oral communication
5.1 Definition
5.2 Forms of oral communication
5.3 Advantages and disadvantages of oral communication
5.4 Listening
5.5 Meaning of listening
5.6 Importance of listening
5.7 Causes / Reasons for not listening
5.8 Suggestions for good listening skills

CHAPTER SEVEN
7.0 Reports
7.1 Definition of reports, types and uses
7.2 Formatting report writing, problems with reports in any given organization
7.3 Mitigation measures of report writing

CHAPTER EIGHT
8.0 Meetings
8.1 Meaning, types of meetings, preparation of meetings, notice, agenda & facilities
8.2 Writing, minutes of a meeting
8.3 Check list for organizing successful meetings

CHAPTER NINE
9.0 Practical Exercises
9.1 oral presentations, letter writing, interviews, etc

MODE OF DELIVERY
The mode of delivery will include: lecture, hands-on, demonstration, group discussions and presentation.

ASSESSMENT OF THE COURSE

This course unit will be assessed out of 100 marks as follows;

Course work by continuous assessment	30%
Final examination	70%
Total	**100%**

The marks will be converted into Grade points.
There will be the final examination in the last two weeks of the semester.

REFERENCES

1. Shirley Taylor (1998) Communication for business
2. Wolcott. L A Mastering business communication
3. Ogundipe Engilsh Language
4 Komunda Mabel Birungi, Business communication skills
5. J. A. Bright, English Composition and Grammer
6. Little P. 1996 Communication in business Pitman Publishing. London

23.5 COMPUTER APPLICATIONS I

Course code **CEI 1105**

Credit units **03**

Contact hours **45**

COURSE DESCRIPTION
The course introduces students to the computer applications through practical skills in information technology software to enable them compete favorably in the dynamic technology-based world.

LEARNING OUTCOMES
By the end of this course, Students should l be able to use the common Microsoft Office applications of word processing, spreadsheets, graphics, presentations and databases.

OBJECTIVES
By the end of this course learners should be able to:

1. Identify the different Applications within an Office environment
2. Acquire skills in basic computer software applications and apply them in various business situations in order to facilitate the information management function.
3. Appreciate computer applications in business through hands on
4. Demonstrate the ability to use the common software applications of Microsoft Word, and Microsoft Excel
5. Produce business documents and data analysis and models applicable to business environment

COURSE CONTENT

CHAPTER ONE
1.1 Basic concepts and startup procedures
1.2 Introduction to practical computing
1.3 Connecting computer parts (CPU, Monitor, Mouse, Key board)
1.3 Windows Operating Systems Commands
1.4 Booting the computer
1.5 Using the mouse
1.6 Managing the user interface
1.7 Introduction to Windows programmes

CHAPER TWO
2.0 Word Processing (Document production with MS word)
2.1 Starting Ms Word
2.2 Creating documents
2.3 Looking at and using tool bars
2.4 Entering data
2.5 texts formatting
2.6 page formatting
2.7 Document formatting
2.8 Creating tables

2.9 Sorting and filtering data (plain text and tabulated text)
2.10 Graphics
2.11 printing
2.12 practice assignments

CHAPTER THREE
3.0 Spreadsheets (Microsoft Excel)
3.1 Starting Ms Excel
3.2 Excel tool bars
3.4 Managing workbooks and worksheets
3.5 Entering data and its formatting
3.6 Performing formulae, errors and their corrections
3.7 Calculating using functions
3.8 Sorting and filtering data
3.9 Using Graphs
3.10 Printing
3.11 Practice assignments

MODE OF DELIVERY
The mode of delivery will include: lecture, hands-on, demonstration, group discussions and presentation.

ASSESSMENT OF THE COURSE
This course unit will be assessed out of 100 marks as follows;

Course work by continuous assessment	30%
Final examination	70%
Total	**100%**

The marks will be converted into Grade points.
There will be the final examination in the last two weeks of the semester.

REFERENCES

1. Kathy Ivens and Thomas Barich(1997), How to use Microsoft Office' 97, Ziff-Davis press
2. Whitecomb A and Brown B, Key boarding and Document production, Stanley Thornes, **Chem.: emam**
3. E.S. Waburoko(200), An introduction to information technology, Department to Distance Learning, Edsoft Computer Institute
4. Teach yourself Microsoft Excel 97 in 24 Hours by Linda Jones and Reul L. Hernadez by S: MS
5. Hernandez cy SAW Publishing
6. Keneth C. and Laudon J.P: Essentials of Management Information Systems; 3rd Edition Prentice Hall, New Jersey, 1999
7. Elliot G. and Starkings:Business Information Technology, Theory and Practice; Addison Wesley, Longman, London and New York, 1998
8. Olive and Chapman; Data Processing and Information Technology, DP Publications
9. Christopher Barnatt (1996): Management Strategy; ND Information Technology; International Thomson Business Press.

23.6 ELECTRICAL INSTALLATION PROJECT I

COURSE CODE CEI 1106

CREDIT UNITS 5

CONTACT HOURS 75

PROJECT DESCRIPTION
This course introduces students to hands on training in all the areas covered theoretically.

PROJECT OUTPUT
Students should be able to fabricate meter boxes and MK boxes unaided

OBJECTIVES OF THE PROJECT

By the end of this course students should be able to;
1) Fabricate a metal box
2) Fabricate other MK boxes

COURSE CONTENT

CHAPTER ONE
1.0 Fabrication of a meter box

CHAPTER TWO
2.0 Fabrication of MK boxes

CHAPTER THREE
3.0 Innovation: Student's self initiated project relevant to the programme.

MODE OF DELIVERY
This mode of delivery will be taught through demonstrations, illustrations, site visits, guided discussion, practical work, report writing and presentations

ASSESSMENT OF THE COURSE
This course unit will be assessed out of 100 marks as follows:

Project Assessment 1	20%
Project Assessment 2	20%
Student's Personal Project	20%
Project Assessment 4	40%
Total	**100%**

The marks will be converted into Grade points.

24.0 YEAR ONE SEMESTER TWO

24.1 ELECTRICAL INSTALLATION REGULATIONS AND PRACTICE II

COURSE CODE **CEI 1201**

CREDIT UNITS **04**

CONTACT HOURS **60**

COURSE DESCRIPTION
This course introduces students to wiring and installation procedures.

LEARNING OUTCOMES
Students should be able to do wiring, earthing, will be able to identify different types of wiring systems.

OBJECTIVES OF THE COURSE
By the end of this course students should be able to:
1. Identify different types of wiring systems
2. State IEE regulations for lead sheathed system
3. Appreciate the importance of earthing
4. Test & inspect continuity, insulation resistance & effectiveness of earthing

COURSE CONTENT

CHAPTER ONE
1.0 Wiring System
1.1 Bare conductors
1.2 Steel conduct system
1.3 Slip joint conduct
1.4 Grip fitting
1.5 Screwed conduct
1.6 Cutting and Screwing
1.7 Fixing conducts, Running couple and conduct fittings
1.8 Flexible conduct draws in wires]
1.9 General IEE regulations for lead sheathed system
1.10 Bond wire system PVC sheathed cables
1.11 Mineral installed sheathed cables
1.12 Wiring between buildings

CHAPTER TWO
2.0 Wiring accessories
2.1 Lamp holder and carting roses
2.2 Lighting roses circuits switches
2.3 Plug and socket outlets
2.4 Fuses (course current protection)
2.5 Distribution boards
2.6 Miniature circuit's breakers (close excess current)
2.7 Oil filled circuit breakers

CHAPTER THREE

3.0 Earthing

3.1 Definitions
3.2 Danger from earthed metal
3.3 IEE Regulations
3.4 Bath rooms
3.5 Basic earthing equipments
3.6 Methods of earthing
3.7 Earth electrodes
3.8 Earth leakage trips and portable appliances

CHAPTER FOUR

4.0 Testing and Inspection

4.1 Introduction
4.2 Insulation resistance test
4.3 Continuity test
4.4 Verification of polarity of single pole switches
4.5 Testing polarity with live and dead circuits
4.6 Earth fault loop testing
4.7 Line earth loop
4.8 Measurement of consumer earth electrodes resistance
4.9 Test of ring circuits continuity
4.10 Completion certificate and inspection certificate
4.11 Testing instruments
4.12 Fault finding on a completed installation

CHAPTER FIVE

5.0 Cables

5.1 Definition
5.2 Types of cables
5.3 Cables used in sheathed wiring
5.4 Methods of preparing termination vulcaninsed rubber insulation (VRI
5.5 PVC
5.6 Types of flexible cards
5.7 Covering of cables

CHAPTER SIX

6.0 **Wiring circuits, Accessories and appliances**

6.1 Fuses, circuit breakers, ceiling rose, sockets, switches, plug (3pin)
6.2 Connectors, Function boxes
6.3 Coloring of core of flexible cables
6.4 Wiring circuit (lighting circuit), colour cord of cables, termination of switches, lamp holders etc.
6.5 Sockets i.e. Radiant circuit, Ring circuits
6.6 Wiring bell circuits with indicator board and carrying out experiments with cell service and parallel

MODE OF DELIVERY

The mode of delivery will include: lecture, hands-on, demonstration, group discussions and presentation.

ASSESSMENT OF THE COURSE

This course unit will be assessed out of 100 marks as follows;

Course work by continuous assessment	30%
Final examination	70%
Total	**100%**

The marks will be converted into Grade points.
There will be the final examination in the last two weeks of the semester.

REFERENCES

1. Basic Electrical installation work Fifth Edition by Trevor Linsley
2. Electrical installation work by A.O Akintante and J.M. Hyde
3 Electrical Installation work Sixth Edition by T.G Francis
4. Electrical installation work Fifth Edition by Thompson
5. IEE Wiring Regulations Explained and Illustrated by Brian Scaddan

24.2 ELECTRICAL PRINCIPLES II

COURSE CODE **CEI 1202**

CREDIT UNITS **04**

CONTACT HOURS **60**

COURSE DESCRIPTION
This course introduces students to electromagnetic circuits and their principles.

LEARNING OUTCOMES
Students should be able to appreciate the importance of magnetism and connect capacitors in series and parallel

OBJECTIVES OF THE COURSE
By the end of this course students should be able to
1. Define the terms used
2. Appreciate the importance of magnetism & their applications
3. State behaviors of magnets
4. Connect capacitors in series & parallel

COURSE CONTENT

CHAPTER ONE
1.0 Electromagnetic induction
1.1 Induced Em.
1.2 The transformer
1.3 Flemings right hand rule
1.4 Lenz's law
1.5 Calculation of induced emf

CHAPTER TWO
2.0 Magnetic circuits
2.1 Magneto-motive force
2.2 Magnetic field strength
2.3 Permeability of free space
2.4 Relative permeability
2.5 Composition magnetic circuits
2.6 Determination of magnetization curve for iron
2.7 Current-lining theory of magnetization

CHAPTER THREE
3.0 Electrostatics
3.1 Electrification by friction
3.2 Structures of atom
3.3 Capacitor
3.4 Electric field strength and electric flux density
3.5 Permittivity of free space
3.6 Relative permeability
3.7 Capacitance of parallel plate capacitor

3.8 Charging and discharging current
3.9 Energy stored in capacitor

CHAPTER FOUR
4.0 Inductance in circuit
4.1 Inductive and non inductive circuits
4.2 Factors determining inductance of the coil
4.3 Iron-cored inductances in DC circuit
4.4 Curve of current growth inductive
4.5 Time constant
4.6 Energy stored in magnetic field

CHAPTER FIVE
5.0 Alternating voltage and current
5.1 Sine wave
5.2 Generation of emf
5.3 Relationship between frequency, speed and number of pole pairs

MODE OF DELIVERY
The mode of delivery will include: lecture, hands-on, demonstration, group discussions and presentation.

ASSESSMENT OF THE COURSE
This course unit will be assessed out of 100 marks as follows;

Course work by continuous assessment	30%
Final examination	70%
Total	**100%**

The marks will be converted into Grade points.
There will be the final examination in the last two weeks of the semester.

REFERENCES

1. Principles of Electricity by Morley & Hughes 5th Edition
2. Any other relevant text book
3. Basic Electrical installation work Fifth Edition by Trevor Linsley
4. Electrical installation work by A.O Akintante and J.M. Hyde
5. Electrical Installation work Sixth Edition by T.G Francis
6. Electrical installation work Fifth Edition by Thompson
7. IEE Wiring Regulations Explained and Illustrated by Brian Scaddan

24.3 MATHEMATICS II

COURSE CODE **CEI 1203**

CREDIT UNITS **04**

CONTACT HOURS **60**

COURSE DESCRIPTION
This course helps students to solve mathematical related problems in the field.

LEARNING OUTCOMES
Students should be able to use mathematical approaches to solve electrical problems

OBJECTIVES OF THE COURSE
By the end of this course students should be able to:
1. Apply different methods of solving equations using matrices
2. Differentiate product and quotient of functions
3. Apply factorization in solving equations
4. Integrate and differentiate trigonometric functions
5. Appreciate the importance of Pascal's Triangle

COURSE CONTENT

CHAPTER ONE
1.**0** **Matrices**
1.1 Addition, subtraction and multiplication of
1.2 Matrices, determination of a 2 x 2 and 3 x3
1.3 Matrix, transpose and cofactors of matrices,
1.4 Inverse matrices by adjoin method.
1.5 Introduction to Differentiation

CHAPTER TWO
2.0 **Differentiating with respect to x from first Principles**
2.1 Principles of y =x and y =x2; alternative notation
2.2 For first derivative; application of formulae for
2.3 Differentiation of products and quotients of functions; the chain rule; differentiation, algebraic, trigonometric functions and natural Logarithms.

CHAPTER THREE
3.0 Introduction to Integration
3.1 Integration as the reverse of differentiation,
3.2 Functions of a linear function of x;
3.3 Integration of trigonometric functions (sin x,cos and tan x);
3.4 Integration of polynomial function.

CHAPTER FOUR
4.0 Permutations and combinations;
4.1 The factorial notation, Pascal's triangle,
4.2 General binomial expansion of $(1+X)^n$

CHAPTER FIVE

5.0 The Circle

5.1 Equation, $x2+y^2+2fy+c=0$;the questions of tangents to the circle

CHAPTER SIX

6.0 Trigonometric identities

6.1 Proof of simple trigonometric identities;

6.2 Application of the formular for sin (A+. B), cos— — (A + B) and tan (A+ B) in solving trigonometric ratios e.g. determining sin 75^0, cos 120^0, etc Without using calculators or tables

CHAPTER SEVEN

7.0 **Statistics**

7.1 Discrete and continuous data;

7.2 Frequency and histograms

7.3 Central tendency-mean mode and

7.4 Medium, Dispersion –variance and standard deviation.

CHAPTER EIGHT

8.0 I**ntroduction to partial Fractions**

8.1 Rules of partial fractions-linear factors and repeated factors only.

MODE OF DELIVERY

The mode of delivery will include: lecture, hands-on, demonstration, group discussions and presentation.

ASSESSMENT OF THE COURSE

This course unit will be assessed out of 100 marks as follows;

Course work by continuous assessment	30%
Final examination	70%
Total	**100%**

The marks will be converted into Grade points.

There will be the final examination in the last two weeks of the semester.

REFERENCES

1. Mathematics for Technicians by Taylor Level II

2. Pure mathematics back house I

24.4 SOLAR ENERGY INSTALLATION

COURSE CODE CEI 1204

CREDIT UNITS 04

CONTACT HOURS 60

COURSE DESCRIPTION
This course introduces students to solar energy accessories, their basic installation and maintenance.

LEARNING OUTCOMES
Students should be able to install simple solar system, repair and maintain solar equipments like batteries

OBJECTIVE OF THE COURSE
By the end of this course students should be able to:
1. Demonstrate the understanding of concepts and principles of solar energy installation
2. Install solar PVC systems, inverters and domestic systems
3. Demonstrate the skill of wiring domestic and industrial installation
4. Prepare site for solar installation

COURSE CONTENT

CHAPTER ONE
1.0 **Introduction**
1.1 Definition
1.2 Principles of solar energy
1.3 Forms of solar energy
1.4 Energy sources
1.5 Solar radiation

CHAPTER TWO
2.0 Solar Energy in Africa
2.1 Types of Solar cells
2.2 Manufacturing Solar cells using crystalline Silicon
2.3 Factors affecting solar energy
2.4 Photovoltaic modules

CHAPTER THREE
3.0 Solar PV technology.
3.1 Type s of PV Systems
3.2 Application of solar PV
3.3 Advantages and disadvantages of solar PV.
3.4 Power output of a PV system
3.5 Solar Modules

CHAPTER FOUR

4.0 **Batteries**
4.1 Types of batteries
4.2 Stacks of batteries (shallow discharge Vs Deep discharge
4.3 Charging and discharging of batteries
4.4 Maintaining batteries.
4.5 Safety precautions for maintenance of batteries.

CHAPTER FIVE

5.0 Power conditioning Units
5.1 Inverters
5.2 Converters
5.3 Load consumption analysis
5.4 Sizing of PV components
5.5 P.V system mechanical design
5.6. System protection and safety
5.7 P.V system installation, testing and commissioning

CHAPTER SIX

6.0 Good installation practices
6.1 Wiring
6.1 Appliances
6.2 Change control units
6.3 Labeling
6.4 Commissioning
6.5 Testing and final connections
6.6 End user training
6.7 Trouble shooting

MODE OF DELIVERY

The mode of delivery will include: lecture, hands-on, demonstration, group discussions and presentation.

ASSESSMENT OF THE COURSE

This course unit will be assessed out of 100 marks as follows;

Course work by continuous assessment	30%
Final examination	70%
Total	**100%**

The marks will be converted into Grade points.
There will be the final examination in the last two weeks of the semester.

REFERENCES

1. Mark Hankins 1995, solar electric systems for Africa, revised edition
2. Dr. Harald schutzeichel (2009), rural electrification with photovoltaic
3. Basic Electrical installation work Fifth Edition by Trevor Linsley
4. Electrical installation work by A.O Akintante and J.M. Hyde
5. Electrical Installation work Sixth Edition by T.G Francis
6. Electrical installation work Fifth Edition by Thompson
7. IEE Wiring Regulations Explained and Illustrated by Brian Scaddan

24.5 COMPUTER APPLICATIONS II

Course code **CEI 1205**

Credit units **03**

Contact hours **45**

COURSE DESCRIPTION

The course introduces students to the computer applications through practical skills in information technology software to enable them compete favorably in the dynamic technology-based world.

LEARNING OUTCOMES

By the end of this course, Students should l be able to use the common Microsoft Office applications of word processing, spreadsheets, graphics, presentations and databases.

OBJECTIVES

By the end of this course learners should be able to:

1. Identify the different Applications within an Office environment
2. Acquire skills in basic computer software applications and apply them in various business situations in order to facilitate the information management function.
3. Appreciate computer applications in business through hands on
4. Demonstrate the ability to use the common software applications of Microsoft Word, and Microsoft Excel
5. Produce business documents and data analysis and models applicable to business environment

COURSE CONTENT

CHAPTER ONE

1.0 Database Management (Microsoft Access)

1.1 Starting MS Access
1.2 Creating data bases
1.3 Crating data tables; Using design view, table wizard, by entering data
1.4 Creating relationships between tables
1.5 Creating forms; using form wizard
1.6 Creating queries; using design view, using query wizard
1.7 Sorting and filtering data
1.8 Formatting data in different objects
1.9 Generating reports using report wizard
1.10 printing
1.11 Practice assignments

CHAPTER TWO

2.0 Presentation management (Microsoft point)

2.1 Starting MS Power Point
2.2 Starting a slide presentation and selecting the slides of desire
2.3 Formatting slides in the slide sorter
2.4 Adding coloring to slides

2.5 Graphing in the slides
2.6 Formatting slide show for different slide designs, layouts and animation schemes
2.7 Viewing a slide show
2.8 Saving and printing the slide presentation
2.9 Practice assignments

CHAPTER THREE

3.0 Internet/Intranet

3.1 Internet definition
3.2 History of Internet
3.3 Uses of Internet
3.4 ISP (Internet Service Providers)
3.5 DNS (Domain Name Systems)
3.6 www (World Wide Web)
3.7 Internet Browsers and Search Engines; Google Chrome, Internet Explorer, Mozira Firefox, OPERA
3.8 URL(Uniform Resource Locator)
3.9 Web Portals
3.10 Navigator/Bookmarks/links
3.11 Uploading and Downloading
3.12 Webmail (Electronic Mails); Thunderbird, Outlook.
3.13 Working with news groups
3.14 Printing and Saving Documents
3.15 Social Networking Web: Facebook, Twiter, Google, Yahoo messenger (chart room),
3.16 http: (hypertext Transfer Protocal)
3.16 Creating a homepage
3.17 Internet Security; Virus Infection, Firewalls, Open source programmes (Thunderbird, Outlook Google Chrome, Internet Explorer, Mozira Firefox, OPERA)

MODE OF DELIVERY

The mode of delivery will include: lecture, hands-on, demonstration, group discussions and presentation.

ASSESSMENT OF THE COURSE

This course unit will be assessed out of 100 marks as follows;

Course work by continuous assessment	30%
Final examination	70%
Total	**100%**

The marks will be converted into Grade points.
There will be the final examination in the last two weeks of the semester.

REFERENCES

1. Kathy Ivens and Thomas Barich(1997), How to use Microsoft Office' 97, Ziff-Davis press
2. Whitecomb A and Brown B, Key boarding and Document production, Stanley Thornes, **Chem.: emam**
3. E.S. Waburoko(200), An introduction to information technology, Department to Distance Learning, Edsoft Computer Institute

4. Teach yourself Microsoft Excel 97 in 24 Hours by Linda Jones and Reul L. Hernadez by S: MS
5. Hernandez cy SAW Publishing
6. Keneth C. and Laudon J.P: Essentials of Management Information Systems; 3rd Edition Prentice Hall, New Jersey, 1999
7. Elliot G. and Starkings:Business Information Technology, Theory and Practice; Addison Wesley, Longman, London and New York, 1998
8. Olive and Chapman; Data Processing and Information Technology, DP Publications
9. Christopher Barnatt (1996): Management Strategy; ND Information Technology; International Thomson Business Press.
10. Clifton H.D. and A.G. (1994); Business Information Systems; 5th Edition.
11. Raymond McLeod J (1995): Management Information Systems; 6th Edition; Prentice Hall International Editions.

24.6 ELECTRICAL INSTALLATION PROJECT II

COURSE CODE CEI 1206

CREDIT UNITS 05

CONTACT HOURS 75

PROJECT DESCRIPTION
This course introduces students to hands on training in all the areas covered theoretically

PROJECT OUTPUT
Students should be able to apply the learnt theory practically.

OBJECTIVES OF THE PROJECT
By the end of this course students should be able to;
1) Know the wiring procedures for circuits
2) Manage to install circuits

COURSE CONTENT

CHAPTER ONE
1.0 Typical ring circuits

CHAPTER TWO
2.0 Lead Lag circuit installation

CHAPTER THREE
3.0 Innovation: Student's self initiated project relevant to the programme.

MODE OF DELIVERY
This mode of delivery will be taught through demonstrations, illustrations, site visits, guided discussion, practical work, report writing and presentations

ASSESSMENT OF THE COURSE

This course unit will be assessed out of 100 marks as follows:

Project Assessment 1	20%
Project Assessment 2	20%
Student's Personal Project	20%
Project Assessment 4	40%
Total	**100%**

The marks will be converted into Grade points.

24.7 FIELD WORK

Course Code **CEI 1207**

Credit units 05

Contact hours 75

COURSE DESCRIPTION

This course enables students to transform the knowledge and skills obtained in class into real practical job performance.

LEARNING OUTCOMES

By the end of this course the student will acquire the skills of working with others in a given organization and put into practice what was studied in class.

OBJECTIVES OF THE COURSE

By the end of the course students should be able to:
1. Familiarize themselves with workplace environment
2. Translate what was learnt in class into real life situation
3. Acquire more job competences.
4. Market themselves to prospective employers through demonstration of skills.

SYLLABUS CONTENT
1. Intern orientation to the workplace
2. Planning, identifying and scheduling of industrial training tasks and activities
3. Working under the guidance of the industrial training organization supervisor
4. Visitation by the training institution supervisor to share the experiences and challenges facing the intern.

MODE OF DELIVERY
The method of instruction shall include; practice, demonstration and supervision.

ASSESSMENT OF THE COURSE

This course unit shall be assessed out of 100 marks as follows;

Industrial Training

1. Training institution supervisor	10%
2. Workplace supervisor's assessment	30%
3. Intern's report	30%
Sub total	**70%**
Study Tours	**30%**
Total	**100%**

The marks will be converted to grade points.

25.0 YEAR TWO SEMESTER ONE

25.1 ELECTRICAL INSTALLATION AND REGULATIONS III

COURSE CODE **CEI 2101**

CREDIT UNITS **05**

CONTACT HOURS **75**

COURSE DESCRIPTION
This course introduces students to rules and regulations governing electrical work.

LEARNING OUTCOMES
Students should be able to operate within the Rules and regulations governing Electrical work

OBJECTIVES OF THE COURSE
By the end of this course students should be able to:
1. Calculate tariffs for both commercial and domestic buildings
2. Appreciate the importance of power factor improvement
3. Use electrical measuring instruments properly

COURSE CONTENT

CHAPTER ONE
1.0 Instruments and measurements
1.1 Introduction
1.2. Types – Moving coil, moving Iron
1.3 Application of wattmeter
1.4 Connection of instruments
1.5 Dynamometer wattmeter
1.6 Two wattmeter method

CHAPTER TWO
2.0 Tariffs
2.1 Tariffs for domestic and commercial consumers
2.3 Power factor improvement
2.4 Methods of power factor improvement

CHAPTER THREE
3.0 Illumination
3.1 Incandescent lamp
3.2 Tungsten Iodine
3.3 Neon lamps/tube
3.4 IEE regulations governing discharge lamp
3.5 Fault discharge lamp
3.6 Hot cathode discharge lamp
3.7 High pressure vapour discharge lamp
3.8 Low pressure mercury vapor lamp
3.9 Sodium vapour discharge lamps
3.10 Fluorescent lamps

3.11 Low pressure mercury vapour lamp
3.12 Quick stating
3.13 Stroboscopic effect

CHAPTER FOUR
4.0 Electric heating
4.1 Electric water heater
4.2 Regulation for heating circuits

CHAPTER FIVE
5.0 Machines
5.1 Introduction to machines/motors
5.2 IEE regulations covering motors
5.3 Motor stators
5.4 Single phase motors
5.5 Three phase motors

CHAPTER SIX
6.0 Conductor and wiring
6.1 Termination of conductors
6.2 Wiring in single pole and neutral fuse board
6.3 Methods of fixing conduits (surfaces or sunk work)
6.4 Preparing termination of 2 or more core mineral insulated cables
6.5 Setting, fixing and addressing mineral insulated cables

CHAPTER SEVEN
7.0 Bell circuits
7.1 Wiring bells with relay for continuous ringing
7.2 Construction and assembly of electric fires
7.3 lectric iron

CHAPTER EIGHT
8.0 Electric Heating appliances
8.1 Cooker
8.1.1 Types
8.1.2 Installation and Protection
8.2 Water heaters
8.2.1 Types
8.2.2 Construction and assembling of immersion heaters

CHAPTER NINE
9.0 Soldering
9.3 Methods of soldering
9.4 Care and usage of blow lamps and soldering iron
9.5 Safety and care
9.6 Electric shock
9.6.1 Fitting lugs on cables
9.6.2 Use of fluxes
9.6.3 Soft and hard soldering Reverting
9.6.4 Care and use of drills & clunks, taps and dies

MODE OF DELIVERY

The mode of delivery will include: lecture, hands-on, demonstration, group discussions and presentation.

ASSESSMENT OF THE COURSE

This course unit will be assessed out of 100 marks as follows;

Course work by continuous assessment	30%
Final examination	70%
Total	**100%**

The marks will be converted into Grade points.

There will be the final examination in the last two weeks of the semester.

REFERENCES

1. Basic Electrical installation work Fifth Edition by Trevor Linsley
2. Electrical installation work by A.O Akintante and J.M. Hyde
3 Electrical Installation work Sixth Edition by T.G Francis
4. Electrical installation work Fifth Edition by Thompson
5. IEE Wiring Regulations Explained and Illustrated by Brian Scaddan

25.2 ELECTRICAL PRINCIPLES III

COURSE CODE **CEI 2102**

CREDIT UNITS **04**

CONTACT HOURS **60**

COURSE DESCRIPTION

This course introduces students to direct current machines, their operation, AC circuits and AC power circuits**.**

LEARNING OUTCOMES

Students should be able to appreciate the applications of Electrical machines through calculations

OBJECTIVES OF THE COURSE

1. Identify different electric circuits
2. Calculate inductance, capacitance and impedance of the circuits
3. Calculate the values of potential difference across each component
4. Appreciate the general arrangement of AC machine

COURSE CONTENT

CHAPTER ONE

1.0 AC Circuits

1.1 Circuits with resistance only
1.2 Circuits with inductance only
1.3 With capacitance only
1.4 With resistance, inductance and capacitance in series
1.5 Resistance and inductances in series
1.6 Resistance and inductance in parallel
1.7 Representation by rotating phases
1.8 AC Power circuits
1.9 Natural frequency of oscillation
1.10 Resonance in parallel circuit
1.11 Q. factor and power factor

CHAPTER TWO

2.0 Direct Current machines

2.1 General arrangements of machine
2.2 Armature cell
2.3 Eddy currents
2.4 Ring-wound armature
2.5 Double –layer drum winding
2 .6 Lap winding and wave
2.7 Windings
2.8 Emf equations
2.9 Production of torque

CHAPTER THREE

3.0 **Cells**
3.1 Types of cells
3.2 Characteristics of lead-acid cell
3.3 Maintenance of a lead – acid battery
3.4 Alkaline cells
3.5 Chemical reaction

MODE OF DELIVERY

The mode of delivery will include: lecture, hands-on, demonstration, group discussions and presentation.

ASSESSMENT OF THE COURSE

This course unit will be assessed out of 100 marks as follows;

Course work by continuous assessment	30%
Final examination	70%
Total	**100%**

The marks will be converted into Grade points.
There will be the final examination in the last two weeks of the semester.

REFERENCES

1. Principles of Electricity by Morley & Hughes 5th Edition
1. Basic Electrical installation work Fifth Edition by Trevor Linsley
2. Electrical installation work by A.O Akintante and J.M. Hyde
3 Electrical Installation work Sixth Edition by T.G Francis
4. Electrical installation work Fifth Edition by Thompson
5. IEE Wiring Regulations Explained and Illustrated by Brian Scaddan

25.3 ELECTRICAL DESIGNING, PLANNING AND DRAWING I

COURSE CODE **CEI 2103**

CREDIT UNITS **04**

CONTACT HOURS **60**

COURSE DESCRIPTION
This course introduces students to the understanding of electrical symbols, circuit diagrams and different types of installation.

LEARNING OUTCOMES
Students should be able to plan, design, draw, and interpret e.g. making estimates of materials from the drawings

OBJECTIVES OF THE COURSE
By the end of this course students should be able to:
1. Draw and Interpret the drawing
2. Calculate the material required from the drawing
3. Position of electrical accessories
4. Plan for an electric installation

COURSE CONTENT

CHAPTER ONE
1**.0 Introduction**
1.1 Graphic symbols (Electrical symbols)
1.2 Purpose & aims of electrical drawing, planning & design
1.3 Scale on drawing – Regulations (EEI)
1.4 Importance of key, - Circuit diagram

CHAPTER TWO
2.0 Types of installation / drawing
2.1 Single phase (domestic)
2.2 Single phase (commercial)
2.3 Hospitals

CHAPTER THREE
3**.0 Types of diagrams**
3.1 Circuit diagram
3.2 Line diagram
3.3 Final circuit
3.4 Block diagram
3.5 Materials
3.6 Duration for the work
3.7 Customer demands

MODE OF DELIVERY
The mode of delivery will include: lecture, hands-on, demonstration, group discussions and presentation.

ASSESSMENT OF THE COURSE

This course unit will be assessed out of 100 marks as follows;

Course work by continuous assessment	30%
Final examination	70%
Total	**100%**

The marks will be converted into Grade points.
There will be the final examination in the last two weeks of the semester.

REFERENCES

1. Electrical installation technology by Motivate
2. Electrical installation work by Thompson 2nd and 3rd editions
3. Electrical installation by Akintante
4. KLB Electricity 2011

25.4 ENGINEERING SOFT WARE

COURSE CODE **DWE 2104**

CREDIT UNITS 03

CONTACT HOURS 45

COURSE DESCRIPTION
This course introduces students the design of building structures using the computer programmes of Auto and Arch CAD.

LEARNING OUTCOMES
By the end of the course, students will be able to use a computer for designing and drawing building structures and facilities.

OBJECTIVES OF THE COURSE
By the end of this course, students should be able to;
1. Use a computer for designing and drawing building structures and facilities
2. Use AutoCAD and ArchiCAD in designing buildings, road sections and other facilities

CHAPTER ONE
1.0 File Management
1.1 Create new files, save a file, Open a file,
1.2 Export, Publish, Recover
1.3 Send, Publish

CHAPTER TWO
2.0 Drawing
2.1 Creation of layers
2.2 Line ray, construction line, multi line
2.3 Polyline, 3D polyline, polygon, Rectangle
2.4 Arch Circle Donut, Ellipse, Spline
2.5 Block, Point
2.6 Hatch, Boundary, Region, Cloud

CHAPTER THREE
3.0 Methods for Viewing Drawing
3.1 Regenerate
3.2 Redraw
3.3 Zoom
3.4 Pan
3.4 Hide, Shade and Render
3.5 Dimension

CHAPTER FOUR
4.0 Dimensioning
4.1 Linear, Aligned, Ordinate
4.2 Radius Diameter Angular
4.3 Baseline, Text, Dimension styles

CHAPTER FIVE

5.0 Modifying a Drawing

5.1 Match Properties, Object, Clip
5.2 Erase, Copy, Offset, Array
5.3 Move Rotate, Scale, Stretch, and Lengthen
5.4 Trim, Extend, Break, Chamfer, Fillet
5.5 3D Operation, Solid Edit,
5.6 Explode

CHAPTER SIX

6.0 Production of Architectural Drawing

6.1 Review of drawing layout: Title block, Notes, Paper sizes,
6.2 Considerations of site orientation, economy, aesthetics, facilities for disabled, fire safety,
6.3 Block plan, Site Plan, Ground plan
6.4 Sections and Elevations
6.5 Details
6.6 Plotting and printing drawing on plain sheets, tracing and ammonia paper

CHAPTER SEVEN

7.0 Facilities details

7.1 Production of Plumbing & drainage drawings details
7.2 Electrical wiring network to lights and circuits

MODE OF DELIVERY

The mode of delivery will include: lecture, hands-on, demonstration, group discussions and presentation.

ASSESSMENT OF THE COURSE

This course unit will be assessed out of 100 marks as follows;

Course work by continuous assessment	30%
Final examination	70%
Total	**100%**

The marks will be converted into Grade points.
There will be the final examination in the last two weeks of the semester.

REFERENCES

1. Narayan, K. Lalit (2008). *Computer Aided Design and Manufacturing*. New Delhi: Prentice Hall of India. p. 3. ISBN 812033342X.
2. Narayan, K. Lalit (2008). *Computer Aided Design and Manufacturing*. New Delhi: Prentice Hall of India. p. 4. ISBN 812033342X.
3. Madsen, David A. (2012). *Engineering Drawing & Design*. Clifton Park, NY: Delmar. p. 10. ISBN 1111309574.
4. Farin, Gerald; Hoschek, Josef and Kim, Myung-Soo (2002). *Handbook of computer aided geometric design [electronic resource]*. Elsevier. ISBN 978-0-444-51104-1.
5. Ross, Douglas T. (17 March 1961). Computer-Aided Design: A Statement of Objectives. MIT USAF 8436-TM-4.

25.5 ELECTRICAL INSTALLATION PROJECT III

COURSE CODE CEI 2105

CREDIT UNITS 05

CONTACT HOURS **75**

PROJECT DESCRIPTION
This course introduces students to hands on training in all the areas covered theoretically.

PROJECT OUTPUT
Students should be able to put into practice what was learnt theoretically.

OBJECTIVES OF THE PROJECT
By the end of this course students should be able to;
1) Assemble one way single pole switch and two way one lamp
2) Assemble solar panels
3) Manage earthing installation

PROJECT ACTIVITIES

CHAPTER ONE
1.0 Assembly of one way single pole switch and two way one lamp/or two lamps in series or parallel switch controlling one lamp

CHAPTER TWO
2.0 Earthing installation

CHAPTER THREE
3.0 Assembling of solar modules/panels

CHAPTER FOUR
4.0 Innovation: Student's self initiated project related to the programme

MODE OF DELIVERY
The mode of delivery will be taught through demonstrations, illustrations, site visits, guided discussion, practical work, report writing and presentations

ASSESSMENT OF THE COURSE
This course unit shall be assessed out of 100 marks as follows:

Project Assessment 1	20%
Project Assessment 2	20%
Student's Personal Project	20%
Project Assessment 4	40%
Total	**100%**

The marks will be converted into Grade points.

26.0 YEAR TWO SEMESTER TWO

26.1 ELECTRICAL INSTALLATION AND REGULATIONS IV

COURSE CODE CEI 2201

CREDIT UNITS 05

CONTACT HOURS 75

COURSE DESCRIPTION

This course introduces students to understand protection against lightening, fire alarm circuits and standby systems

LEARNING OUTCOMES
Students should be able to install lightening protection systems on structures

OBJECTIVES OF THE COURSE
By the end of the course students should be able to:
1. State factors that determine the requirement of lightening protection
2. Calculate horizontal and vertical conductors
3. Differentiate types of fire alarm systems

COURSE CONTENT

CHAPTER ONE
1.0 Protection against lightening of structures
1.1 Introduction
1.2 Factors which determine whether lighting is required
1.3 Component of lighting protection
1.4 Single vertical protection
1.5 Horizontal; conductor normal use
1.6 Cathode protection

CHAPTER TWO
2.0 Electric fire alarm System
2.1 Introduction
2.2 Open fire alarm
2.3 Closed fire alarm
2.4 Automatic call points
2.5 Manual call points

CHAPTER THREE
3.0 Alarm and Signaling
3.1 Introduction
3.2 Indicators boards
3.3 Silencing switches
3.4 Open circuits
3.5 Closed contacts alarm with indicators board cct faults indicator board
3.6 Closed circuits open cct alarm systems

CHAPTER FOUR

4.0 Power Supply

4.1 Introduction
4.2 Testing IEE regulations
4.3 Maintenance standby source of supply and automatic protection
4.5 Types of stand by supplies or equipment
4.6 None maintenance system

CHAPTER FIVE

5.0 Care and use of portable electric tools

CHAPTER SIX

6.0 Examination of parts of squirrel-case motor assembly

CHAPTER SEVEN

7.0 Wiring connection of single AC induction motor and starter, reversal of connection of rotation
7.1 Tracing circuits and preparing of circuit diagrams

CHAPTER EIGHT

8.0 Fixing and alignment of small motor electric and other circuits
8.1 Motor re-winding (single phase - and three phase motors)

CHAPTER NINE

9.0 Delta- and Star- Motor-Type-connection
9.1 Wiring florescent lamps with separate control fears, testing polarity of s witches.

CHAPTER TEN

9.0 Tracing earth fault in circuits & appliances
10.1 Power driven electrical appliances e.g. washing machines, vacuum cleanings

MODE OF DELIVERY

The mode of delivery will include: lecture, hands-on, demonstration, group discussions and presentation.

ASSESSMENT OF THE COURSE

This course unit will be assessed out of 100 marks as follows;

Course work by continuous assessment	30%
Final examination	70%
Total	**100%**

The marks will be converted into Grade points.
There will be the final examination in the last two weeks of the semester.

REFERENCES

1. Electrical installation technology by Motivate
2. Electrical installation work by Thompson 2nd and 3rd editions
3. Electrical installation by Akintante
4. KLB Electricity 2011

26.2 ELECTRICAL PRINCIPLES IV

COURSE CODE **CEI 2202**

CREDIT UNITS **04**

CONTACT HOURS **60**

COURSE DESCRIPTION

This course introduces students to DC generators, DC motors, transformers and construction of each.

LEARNING OUTCOMES

Students should be able to appreciate DC machines, their construction and operation

OBJECTIVES OF THE COURSE

By the end of this course students should be able to:

1. State methods of exciting DC Generators
2. Differentiate types of generators
3. List factors that the speed and torque of DC motors
4. Determine the efficiency of transformers
5. Demonstrate the generation of three phase supply
6. State the importance of cathode ray oscilloscope
7. Appreciate the principle action of a transformer

COURSE CONTENT

CHAPTER ONE

1.0 DC generators

1.1 Armature in field connection
1.2 Methods of excitation
1.3 Shunt – wound generator
1.4 Series- wound generators
1.5 Compound- wound generator
1.6 Load characteristics of shunt, series, compound
1.7 Separate excited
1.8 Open- circuit characteristic

CHAPTER TWO

2.0 DC motors

2.1 DC machine as motor or generator
2.2 Factors determining speed, torque of a machine
2.3 Motor starters
2.4 Speed and torque characteristics
2.5 Speed control of the motors
2.6 Applications of shunt, series and compound motors

CHAPTER THREE

3.0 Transformers

3.1 The function of transformers
3.2 Principle of action transformer
3.3 The scales transformer
3.4 The equation of a transformer
3.5 Phase diagram of transformer
3.6 The transformer core
3.7 Iron loss of transformer
3.8 Transformer of efficacy
3.9 Transformer regulation

CHAPTER FOUR

4.0 Electrical measuring instruments

4.1 Electrical inducting instruments
4.2 Controlling devices
4.3 Damping devices
4.4 Types of ammeter, voltmeter, and Walt meters
4.5 Digital
4.6 Moving iron instruments
4.7 Measuring of bridge
4.8 The poseritrometer
4.9 Cathode oscilloscope
4.10 Application of CRO
4.11 Accuracy and errors of the instruments
4.12 Measures of resistance using voltmeter-ammeter method

CHAPTER FIVE

5.0 Three phase supply

5.1 Introduction
5.2 Generation of 3 phases
5.3 Star and delta connections
5.4 The three wire stew system
5.5 The four wire star system
5.6 Delta connection
5.7 Power description in a three phase load measuring (merit) of power
5.8 Three phases induction motor

CHAPTER SIX

6.0 Cells (primary and secondary cells)

6.1 A simple cell (voltaic)
6.2 Electrolytic cell with carbon electrodes
6.3 Electrolytic cell with copper electrode action of simple voltaic cell
6.4 Leclanche cell
6.5 Mercury cells
6.6 Secondary cells
6.7 Lead-acid cells
6.8 Chemical reaction in lead- acid cell

MODE OF DELIVERY

The mode of delivery will include: lecture, hands-on, demonstration, group discussions and presentation.

ASSESSMENT OF THE COURSE

This course unit will be assessed out of 100 marks as follows;

Course work by continuous assessment	30%
Final examination	70%
Total	**100%**

The marks will be converted into Grade points.

There will be the final examination in the last two weeks of the semester.

REFERENCES

1. Principles of electricity by Morley and Hughes 5th Edition
1. Basic Electrical installation work Fifth Edition by Trevor Linsley
2. Electrical installation work by A.O Akintante and J.M. Hyde
3 Electrical Installation work Sixth Edition by T.G Francis
4. Electrical installation work Fifth Edition by Thompson
5. IEE Wiring Regulations Explained and Illustrated by Brian Scaddan

26.3 ELECTRICAL DESIGNING, PLANNING AND DRAWING II

COURSE CODE **CEI 2203**

CREDIT UNITS **04**

CONTACT HOURS **60**

COURSE DESCRIPTION

This course introduces students to the understanding of the positioning of electrical accessories, interpretation of drawings and making bills of quantities.

LEARNING OUTCOMES

Students should be able to prepare the Bills of Quantities required from the drawing

OBJECTIVES OF THE COURSE

By the end of this course students should be able to:

1. Calculate cable sizes, Vertical and horizontal run
2. Position electric accessories
3. Prepare the bills of quantities as per the drawing
4. Make installation reports

COURSE CONTENT

CHAPTER ONE

1.0 Cabling

1.1 Calculation involved
1.2 Vertical run
1.3 Horizontal run
1.4 Conduct ran (vertical & horizontal)
1.5 Cable calculation

CHAPTER TWO

2.0 Positioning

2.1 Switches
2.2 lighting points
2.3 Sockets
2.4 Cookers
2.5 H_20 heaters
2.6 Telephones
2.7 Fire detectors
2.8 Cameras
2.9 Washing machines
2.10 Machine Isolators
2.11 Main Control

CHAPTER THREE

3.0 Interpreting the drawing

3.1 Door slip

3.2 Emergency area

3.3 Break glass (Fire alarm) system

CHAPTER FOUR

4.0 Making report

4.1 Type of installation

4.2 Assumptions

- What needs to be done?

CHAPTER FIVE

5.0 Bill of quantities

5.1 Requirements

5.2 Labor

MODE OF DELIVERY

The mode of delivery will include: lecture, hands-on, demonstration, group discussions and presentation.

ASSESSMENT OF THE COURSE

This course unit will be assessed out of 100 marks as follows;

Course work by continuous assessment	30%
Final examination	70%
Total	**100%**

The marks will be converted into Grade points.

There will be the final examination in the last two weeks of the semester.

REFERENCES

1. Electrical installation technology by Motivate
2. Electrical installation work by Thompson 2nd and 3rd editions
3. Electrical installation by Akintante
4. KLB Electricity 2011

26.4 ENTREPRENEURSHIP SKILLS

COURSE CODE CEI 2204

CREDIT UNITS 03

CONTACT HOURS 45

COURSE DESCRIPTION
This course equips students with entrepreneurship knowledge and skills. It imparts in students ability to analyze the environment, in which businesses operate in terms of opportunities and threat, entrepreneurship ventures, project appraisals, creativity and innovation, entrepreneurships, the concept of practical development and sources of business finance.

LEARNING OUTCOMES
The student will be able to analyze the business environment and start business ventures.

OBJECTIVES OF THE COURSE
By the end of this course, students should be able to;
1. Identify business opportunities
2. Generate new ideas for starting up a business
3. Develop a business plan

COURSE CONTENT

CHAPTER ONE
1.0 Introduction
1.1 Introduction to entrepreneurship
1.2 Basic concepts to Entrepreneurship
1.3 Importance of Entrepreneurship education
1.3 Characteristics and qualities of a good entrepreneur
1.4 Classification of entrepreneurs
1.5 The entrepreneurial process

CHAPTER TWO
2.0 Creativity
2.0 Definition of creativity
2.3 Steps of creativity
2.4 Challenges facing entrepreneurs
2.5 Solutions of barriers to entrepreneurship
CHAPTER THREE
3.0 Innovation
3.1 Definition of innovation
3.2 Attributes of a good innovator

CHAPTER FOUR

4.0 Business planning and development

4.1 Sources of business opportunities
4.2 Sources of Capital for a Business
4.3 Small scale businesses Vs Entrepreneur ventures
4.4 Business plan

CHAPTER FIVE

5.0 Entrepreneurship

5.1 Definition
5.2 Importance of Entrepreneurship
5.3 How to develop an organization that supports Entrepreneurship

CHAPTER SIX

6.0 **Concept development**
6.1 Forms of Business start up
6.2 Practically developing an enterprise
6.3 Life after start-up

MODE OF DELIVERY

The mode of delivery will include: lecture, hands-on, demonstration, group discussions and presentation.

ASSESSMENT OF THE COURSE

This course unit will be assessed out of 100 marks as follows;

Course work by continuous assessment	30%
Final examination	70%
Total	**100%**

The marks will be converted into Grade points.
There will be the final examination in the last two weeks of the semester.

REFERENCES

1. Drucker, F.P 1985 innovation and entrepreneurship. Sultan Chand and sons, New Delphi
2. Gupta, CB 1995 Entrepreneurship Development 3rd edition. Sultan Chand and sons, New Delphi
3. Apegu, J.N 2005. How to create a sustainable Business. Longman, London
4. Gupta, C.B. and Srimivasan, N.P. (1996) Entrepreneurial development. Sultan, Chard and Sons Publishers
5. Kao, John; (1989) Entrepreneurship, creativity and organizations. Prentice Hall International
6. Clifford Pinchott III 1985; Intrapreneuring, Harper and Row Publishers, New York
7. Khandwalla N. Pradip 1995, Four the Eye; Excellence Through Creativiy. Wheeler Publishing

26.5 ELECTRICAL INSTALLATION PROJECT IV

COURSE CODE **CEI 2205**

CREDIT UNITS **05**

CONTACT HOURS **75**

PROJECT DESCRIPTION
This course introduces students to motor re-winding, making business plans and proposals.

PROJECT OUTPUTS
Students shall acquire practical skills in rewinding motors, making Bills of quantities, Business plans and proposals

OBJECTIVES OF THE PROJECT
By the end of this course students should be able to;
a) Wire a complete consumer supply with distribution fuse board
b) Wind motors
c) Make bills of quantities
d) Make business plans
e) Make business proposals

PROJECT ACTIVITIES

CHAPTER ONE
1.0 Wiring of typical consumer supplies with distribution fuse board

CHAPTER TWO
2.0 Re-Winding of a motor

CHAPTER THREE
3.0 Making a bill of quantities

CHAPTER FOUR
4.0 Making a business plan

CHAPTER FIVE
5.0 Making a business proposal

CHAPTER SIX
6.0 Innovation: Student's self initiated project related to the programme.

MODE OF DELIVERY
The mode of delivery will be taught through demonstrations, illustrations, site visits, guided discussion, practical work, report writing and presentations

ASSESSMENT OF THE COURSE
This course unit will be assessed out of 100 marks as follows:

Project Assessment 1	20%
Project Assessment 2	20%
Student's Personal Project	20%
Project Assessment 4	40%
Total	**100%**

The marks will be converted into Grade points.

27.0 LIST OF LECTURERS AND TECHNICAL STAFF IN THE FACULTY OF ENGINEERING AND TECHNOLOGY

S/N	NAME	QUALIFICATIONS	EXPERIENCE
1	Akankwasa Phionah	B. VOC. STUD. IN TECH. EDUC (KYU)	3 Years
2	Byamukama Denis	B. VOC. STUD. IN TECH. EDUC (KYU)	3 Years
3	Ingabire Charity	B.VOC. STUD. IN TECH. EDUC (KYU)	3 Years
4	Mwanja Grace Charles	B. Sc Engineering (MUK)	28 Years
5	Kinconco Keneth Muhumuza	ODEE (UNEB), Bsc. Educ. KYU	8 Years
6	Twine Usito Bakesigaki	B. Tech. Teacher Educ. (Mech), KYU	3 Years
7	Nyanzi baker	ODEE (UBTEB) (UTC)	2 Years
8	Twinomujuni Naume	DWE, UNEB (UTC)	3 Years
9	Mugerwa Ashirafu	ODME, UBTEB (UTC)	2 Years
10	Muhumuza Merable	ODCE, UNEB (UTC)	3 Years
11	Niwagaba Edwin	ODIP CERAMICS (UNEB)	2 Years
12	Nabasa Philip	CRAFT I & II, CERT. IN PLUMB (UNEB), DWE	4 Years
13	Mbabazi Alex	ODEE (UNEB) CRAFT I & II ELECT INST (UNEB)	9 Years
14	Tugume Vicent	Craft I & II Carpent & Joinery UNEB, CTTE KYU, DCE Kabale Univ	13 Years
15	Arinda Sam	DME UNEB, HDEE City Guilds of London Institutes	4 Years
16	Niwamanya Paison	ODME (UNEB)	2 Years
17	Narinda Ivan	B. Voc Studies in Tech Educ KYU	2 Years
18	Akampurira Keneth	HDME, ODME (UNEB), B. Sc in Computer Science MUK	17 Years
19	Ashaba Nickolas	ODWE (UNEB)	3 Years
20	Wanjori Paul	B. Sc Electrical Engineering (MUK)	3 Years