



THE REPUBLIC OF KENYA

COMPETENCY BASED CURRICULUM

FOR

BUILDING TECHNOLOGY

KNQF LEVEL: 5

ISCED PROGRAMME CODE: 0732454A



**TVET CDACC
P.O. BOX 15745-00100
NAIROBI**

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FOREWORD

The provision of quality education and training is fundamental to the Government's overall strategy for social economic development. Quality education and training contributes to achievement of Kenya's development blue print and sustainable development goals.

Reforms in the education sector are necessary for the achievement of Kenya Vision 2030 and meeting the provisions of the Constitution of Kenya 2010. The education sector had to be aligned to the 2010 Kenya's Constitution and this resulted in formulation of the Policy Framework for Reforming Education and Training. A key feature of this policy is the radical change in the design and delivery of the TVET training. The reforms require that training in TVET be competency based, curriculum development be industry led, certification be based on demonstration of competence and mode of delivery allows for multiple entry and exit in TVET programmes.

These reforms also demand that Industry takes a leading role in curriculum development to ensure the curriculum addresses its competence needs. It is against this background that TVET CDACC has adopted and adapted this curriculum from the Nyeri National Polytechnic to address skill gaps in the industry.

It is my conviction that this curriculum will play a great role towards development of competent human resource for sustainable growth and development in the Building industry.

Dr. Esther Thaara Mworira, PhD
Principal Secretary,
Ministry of Education,
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PREFACE

Kenya Vision 2030 aims to transform the country into a newly industrializing, “middle-income country providing a high-quality life to all its citizens by the year 2030”. Kenya intends to create a globally competitive and adaptive human resource base to meet the requirements of a rapidly industrializing economy through life-long education and training. Technical, Vocational Education and Training (TVET) institutions have a responsibility of facilitating the process of inculcating knowledge, skills and attitudes necessary for catapulting the nation to a globally competitive country, hence the paradigm shift to embrace Competency Based Education and Training (CBET).

The Technical and Vocational Education and Training Act No. 29 of 2013 on Reforming Education and Training in Kenya, emphasized the need to reform curriculum development, assessment and certification. This called for a shift to CBET to address the mismatch between skills acquired through training and skills needed by industry as well as increase the global competitiveness of Kenyan labour force.

This curriculum is designed and organized with an outline of learning outcomes; suggested delivery methods, training/learning resources and methods of assessing the trainee’s achievement..

I am grateful to the Council Members Council Secretary, of Nyeri National Polytechnic and all those who participated in the development of the original Curriculum, from which TVET CDACC adopted and adapted this curriculum.

CHAIRMAN, TVET CDACC

ACKNOWLEDGEMENT

This curriculum was adopted and adapted from the Nyeri National Polytechnic . I am thankful to the Council and management of the Nyeri National Polytechnic for developing the original curriculum.

My gratitude and appreciation also goes to all the individuals and organizations who participated in adding value to this curriculum.

I am convinced that this curriculum will go a long way in ensuring that workers in Building Sector acquire competencies that will enable them to perform their work more efficiently.

CEO/COUNCIL SECRETARY

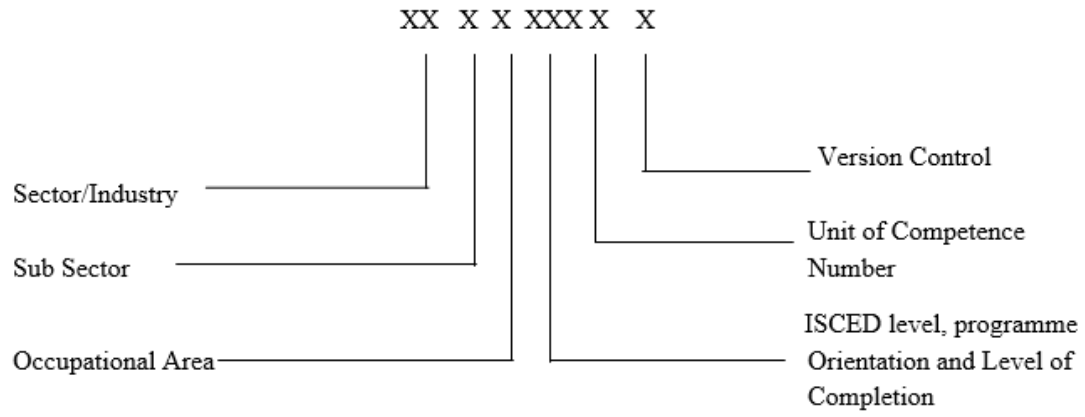
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ABBREVIATIONS AND ACRONYMS

CAD	Computer Aided Design
CCTV	Closed-Circuit Television (surveillance)
EMS	Environmental Management System
ICT	Information Computer Technology
KCSE	Kenya Certificate of Secondary Education
KEBS	Kenya Bureau of Standards
KNQA	Kenya National Qualification Authority
NCA	National Construction Authority
NEMA	National Environment Management Authority
NOS	National Occupational Standards
PPE	Personal Protective Equipment
QA	Quality Assurance
QC	Quality Control
TES	Teach Elite's Shop
TVET	Technical and vocational education and training
TVETA	Technical and Vocational Education and Training Authority
BRC	British reinforcement concrete
ASTM	American society for testing and materials
PPR	Polypropylene pipes
DPM	Damp proof membrane
DPC	Damp proof course
IEE	Institute of electrical engineers
ISCED	International Standard Classification of Education

KEY TO UNIT CODE



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OVERVIEW

Building Technology Level 5 qualification consists of competencies that a person must acquire to enable him/her to be certified as a Building Technology Craftsperson. The competencies include performing construction site preliminary works, executing building substructure, superstructure and external works, constructing roof structure, installing doors and windows and perform building finishes.

The units of Learning comprising Building Technology Level 5 include the following basic, common and core units:

SUMMARY OF UNITS OF COMPETENCY

BASIC UNITS OF COMPETENCY			
Unit Code	Units Title	Duration (Hours)	Credit Factor
CON/CU/BUT/BC/01/5	Communication skills	70	7
CON/CU/BUT/BC/02/5	Digital literacy	110	11
CON/CU/BUT/BC/03/5	Entrepreneurial skills	70	7
CON/CU/BUT/BC/04/5	Employability skills	60	6
CON/CU/BUT/BC/05/5	Environmental literacy	70	7
CON/CU/BUT/BC/06/5	Safety and health practices	70	7
Sub Total		450	45
COMMON UNITS OF COMPETENCY			
Unit Code	Units Title	Duration (Hours)	Credit Factor
CON/CU/BUT/CU/01/5	Basic Mathematics	120	12
CON/CU/BUT/CU/02/5	Technical Drawing	120	12
CON/CU/BUT/CU/03/5	Scientific principles	75	7.5
Sub Total		315	31.5
CORE UNITS OF COMPETENCY			
Unit Code	Units Title	Duration (Hours)	Credit Factor
CON/CU/BUT/CR/01/5	Executing Site preliminary works	40	4
CON/CU/BUT/CR/02/5	Executing Substructure works	80	8
CON/CU/BUT/CR/03/5	Super structure works	120	12
CON/CU/BUT/CR/04/5	Roof Construction	40	4
CON/CU/BUT/CR/05/5	Installation of Doors and windows	40	4
CON/CU/BUT/CR/06/5	Performing Building finishes	60	6
CON/CU/BUT/CR/07/5	Executing External works	60	6
Sub-Total		440	44

CON/CU/BUT/CR/08/5	Industrial Attachment	480	48
Sub Total		920	92
GRAND TOTAL		1685	16.85

Entry Requirements

An individual entering this course should have any of the following minimum requirements:

- a) Kenya Certificate of Secondary Education (KCSE) KCE DIV 3.

Or

- a) Equivalent qualifications as determined by TVET Authority.

Trainer Qualifications

Qualifications of a trainer for this course include:

- a) Possession of a higher qualification than Building Technology level 5 or in related trade area; and
- b) License by TVETA.

Industrial attachment

An individual enrolled in this course will be required to undergo Industrial attachment for a minimum period of 480 hours in a building sector.

Assessment

The course will be assessed formatively and summatively:

- a) During formative assessment all performance criteria shall be assessed based on performance criteria weighting.
- b) Summative assessment shall focus on critical aspects of the Unit of competency.
- c) During summative assessment basic and common units shall be integrated or assessed concurrently with the core units.
- d) Formative and summative assessment weights shall constitute 60% and 40% of the overall score respectively.
- e) Theory and practical weight shall be 40:60 respectively for each unit of learning;
- f) For a candidate to be declared competent in a unit of competency, the candidate must meet the following conditions:
 - i) Obtained at least 40% in theory assessment in formative and summative

assessments.

- ii) Obtained at least 50% in practical assessment in formative and summative assessment where applicable.
 - iii) Obtained at least 50% in the weighted results between formative assessment and summative assessment where the former constitutes 60% and the latter 40% of the overall score.
- g) Assessment performance rating for each unit of competency shall be as follows:

MARKS	COMPETENCE RATING
80 -100	Mastery
65 - 79	Proficiency
50 - 64	Competent
49 and below	Not Yet Competent
Y	Assessment Malpractice/irregularities

- h) Assessment for Recognition of Prior Learning (RPL) may lead to award of Certificate of Competency

Certification

A candidate will be issued with a Certificate of Competency upon demonstration of competence in a core Unit of Competency. To attain the Full Building Technology Level 5 certificate, the candidate must demonstrate competence in all the Units of Competency as given in the qualification pack.

These certificates will be issued by TVET CDACC .

BASIC UNITS OF COMPETENCY

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COMMUNICATION SKILLS

UNIT CODE: CON/CU/BUT/BC/01/5

UNIT DURATION: 70 Hours

Relationship to Occupational Standards

This unit addresses the Unit of Competency: Apply Communication Skills

Unit Description

This unit describes knowledge, skills and attitudes required to apply general aspects of communication, communicate through verbal, written, on-verbal and visual and audio-visual media, conduct interviews and conduct technology in communication.

Summary of Learning Outcomes

1. To Apply general aspects of communication
2. To Communicate through verbal medium
3. To Communicate through written medium
4. To Communicate through non-verbal medium
5. To Communicate through visual and audio-visual media
6. To Conduct interviews
7. To Apply technology in communications

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Apply general aspects of communication	<ul style="list-style-type: none">• Meaning of communication• Objectives of communication• Communication process• Principles of communication• Effective communication• Barriers to communication• Channels of communication• Workplace etiquette• Ethical work practices in handling communication	<ul style="list-style-type: none">• Observation• Oral questioning• Portfolio of evidence• Interviews• Third party report• Written tests

<p>2. Communicate through verbal medium</p>	<ul style="list-style-type: none"> • Meetings • Speeches • Briefings • Interviews • Discussions • Conversations 	<ul style="list-style-type: none"> • Observation • Oral questioning • Portfolio of evidence • Interviews • Third party report • Written tests
<p>3. Communicate through written medium</p>	<ul style="list-style-type: none"> • Business letters • Minutes • Memos • CV • Circulars • Reports • Notices • Speeches • Advertisements • Press releases • Memorandum of Understandings (M.O.U.s) • Quotations • Client contracts • Resource requisitions and checklist forms • Invoices 	<ul style="list-style-type: none"> • Observation • Oral questioning • Portfolio of evidence • Interviews • Third party report • Written tests
<p>4. Communicate through non-verbal medium</p>	<ul style="list-style-type: none"> • Body language • Dressing code • Signs, symbols and signals • Colour codes 	<ul style="list-style-type: none"> • Observation • Oral questioning • Portfolio of evidence • Interviews • Third party report • Written tests
<p>5. Communicate through visual and audio-visual media</p>	<ul style="list-style-type: none"> • Pictures and posters • Demonstrations • Graphical presentations 	<ul style="list-style-type: none"> • Observation • Oral questioning • Portfolio of evidence • Interviews • Third party report • Written tests
<p>6. Conduct interviews</p>	<ul style="list-style-type: none"> • Preparation for interview • interview techniques 	<ul style="list-style-type: none"> • Observation • Oral questioning

	<ul style="list-style-type: none"> • Records of interviews 	<ul style="list-style-type: none"> • Portfolio of evidence • Interviews • Third party report • Written tests
7. Apply technology in communication	<ul style="list-style-type: none"> • Emails • Online meetings • Social media platforms. • Text messages • Digital presentations. 	<ul style="list-style-type: none"> • Observation • Oral questioning • Portfolio of evidence • Interviews • Third party report • Written tests

Suggested Methods of Instruction

- Role playing
- Viewing of related videos
- Discussion
- Direct Instruction

Recommended Resources for 25 Trainees

- 25 Desktop computers/laptops
- Internet connection
- 2 Projectors
- 5 Telephone
- 5 boxes Assorted Flash Cards
- 5 Whiteboards
- 5 rolls Flip Charts
- Assorted colour of whiteboard markers
- 1 invoice book

DIGITAL LITERACY

UNIT CODE: CON/CU/BUT/BC/02/5

Relationship to Occupational Standards

This unit addresses the Unit of Competency: Apply digital literacy

Duration of Unit: 110 Hours

Unit Description

This unit covers the competencies required to effectively use digital devices such as smartphones, tablets, laptops and desktop PCs. It entails identifying and using digital devices such as smartphones, tablets, laptops and desktop computers for purposes of communication, work performance and management at the work place.

Summary of Learning Outcomes

1. To identify appropriate computer software and hardware
2. To apply basic security measures
3. To perform word-processing operations
4. To perform spread sheet operations
5. To perform database operations
6. To apply internet and email in communication
7. To perform desktop publishing
8. To prepare PowerPoint presentation
9. To perform Online Collaboration

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Identify computer software and hardware	<ul style="list-style-type: none">• Concepts of ICT• Functions of ICT• Introduction to computers• Computer peripherals• History of computers• Classification of computers	<ul style="list-style-type: none">• Oral presentation• Observation• Practical• Simulations• Written tests

	<ul style="list-style-type: none"> • Components of a computer system • Classification of software • Operating system functions and commands 	
2. Apply basic data security measures	<ul style="list-style-type: none"> • Data security and control • Security threats and control measures • Types of computer crimes • Detection and protection against computer crimes • Laws governing protection of ICT 	<ul style="list-style-type: none"> • Oral presentation • Observation • Practical • Simulations • Written tests
3. Perform word-processing operations	<ul style="list-style-type: none"> • Working with documents <ul style="list-style-type: none"> -Open and close word processor -Create a new document -Save a document -Switch between open documents • Enhancing productivity <ul style="list-style-type: none"> - Set basic options/preferences - Help resources - Use magnification/zoom tools - Display, hide built-in tool bar - Using navigation tools • Enter text • Select, edit • Formatting text • Formatting paragraph • Formatting styles • Creating table • Formatting tables • Graphical objects <ul style="list-style-type: none"> - Insert object (picture, drawn object) - Select an object - Edit an object - Format an object • Mail merge preparation • Mail merge output 	<ul style="list-style-type: none"> • Oral presentation • Observation • Practical • Simulations • Project • Written tests

	<ul style="list-style-type: none"> • Print setup • Printing 	
4. Perform spread sheet operations	<ul style="list-style-type: none"> • Using spreadsheet application • Cells <ul style="list-style-type: none"> -Inserting, selecting, editing, sorting, moving, coping and deleting • Managing worksheets <ul style="list-style-type: none"> -Rows and columns -Worksheets • Formulas and functions <ul style="list-style-type: none"> -Arithmetic functions -Inbuilt functions • Formatting <ul style="list-style-type: none"> -Numbers/dates -Contents -Alignment, border effect • Charts <ul style="list-style-type: none"> -Create -Edit -Format • Print setup • Printing 	<ul style="list-style-type: none"> • Oral presentation • Observation • Practical • Simulations • Project • Written tests
5. Perform database operations	<ul style="list-style-type: none"> • Understand database <ul style="list-style-type: none"> -Key concepts -Database organisation -Relationships -Operations • Using the application <ul style="list-style-type: none"> - Working with database - Common tasks • Tables <ul style="list-style-type: none"> -Records -Designs • Retrieving information <ul style="list-style-type: none"> -Main operations -Queries • Objects <ul style="list-style-type: none"> - Using forms 	<ul style="list-style-type: none"> • Oral presentation • Observation • Practical • Simulations • Project • Written tests

	<ul style="list-style-type: none"> • Outputs <ul style="list-style-type: none"> - Reports - Data exporting - Importing - Printing 	
6. Apply Internet and email in communication	<ul style="list-style-type: none"> • Web browsing concepts <ul style="list-style-type: none"> -Key concepts -Security and safety • Web browsing <ul style="list-style-type: none"> -Using the web browser -Tools and settings -Bookmarks -Web outputs • Web based information <ul style="list-style-type: none"> - Search - Critical evaluation - Copyright, data protection • Communication concepts <ul style="list-style-type: none"> - Online communities - Communication tools - Email concepts • Using email <ul style="list-style-type: none"> -Sending email -Receiving email -Tools and settings -Organizing email -Using calendars • Emerging issues in Internet and email communication 	<ul style="list-style-type: none"> • Oral presentation • Observation • Practical • Simulations • Project • Written tests
7. Perform desktop publishing	<ul style="list-style-type: none"> • Desktop publishing concepts • Desktop publishing application • Using the desktop publishing application • Desktop publication design <ul style="list-style-type: none"> - Banners - Booklets 	<ul style="list-style-type: none"> • Oral presentation • Observation • Practical • Simulations • Project • Written tests

	<ul style="list-style-type: none"> - Brochures - Flyers - Posters - Cards - Certificates - Magazines • Print setup • Printing 	
<p>8. Prepare PowerPoint presentation</p>	<ul style="list-style-type: none"> • Using application <ul style="list-style-type: none"> - Working with presentations <ul style="list-style-type: none"> - Open and close presentations - Create a new presentation - Save a presentation - Switch between open presentations - Enhancing productivity <ul style="list-style-type: none"> - Set basic options/ preferences - Help resources - Use magnification/zoom tools - Display, hide built-in tool bar - Using navigation tools • Developing a presentation <ul style="list-style-type: none"> - Presentation views - Slides - Master slide • Text <ul style="list-style-type: none"> - Handling text - Formatting - Tables • Charts <ul style="list-style-type: none"> - Using charts - Organisation charts • Graphical objects <ul style="list-style-type: none"> - Insert, manipulate 	<ul style="list-style-type: none"> • Oral presentation • Observation • Practical • Simulations • Project • Written tests

	<ul style="list-style-type: none"> - Drawing • Prepare outputs <ul style="list-style-type: none"> - Preparation - Check and deliver <ul style="list-style-type: none"> - Spell check a presentation - Slide orientation - Slide shows, navigation - Print presentation 	
9. Perform Online Collaboration	<ul style="list-style-type: none"> • Collaboration concepts <ul style="list-style-type: none"> - Key concepts - Cloud computing • Preparation for online collaboration <ul style="list-style-type: none"> - Common setup features - Setup • Using online collaborative tools <ul style="list-style-type: none"> - Online storage and productivity - Applications - Online calendars - Social media - Online meetings - Online learning environment • Mobile collaboration <ul style="list-style-type: none"> - Key concepts - Using mobile devices - Applications - Synchronization 	<ul style="list-style-type: none"> • Oral presentation • Observation • Practical • Simulations • Project • Written tests

Suggested Methods of Instruction

- Instructor led facilitation of theory
- Demonstration by trainer
- Practical work by trainee
- Viewing of related videos
- Group discussions

Recommended Resources for 25 Trainees

General Resources	Materials and supplies
<ul style="list-style-type: none"> • 25 Computers 	25 Flash disks
<ul style="list-style-type: none"> • 5 Printers 	25 CDs/DVDs
<ul style="list-style-type: none"> • 1 Projector 	
<ul style="list-style-type: none"> • Internet access 	25 FLASH DISKS
<ul style="list-style-type: none"> • 5 scanners 	5 Modems
<ul style="list-style-type: none"> • 2 Printing papers 	25 External hard disk
<ul style="list-style-type: none"> • Assorted colour of whiteboard markers 	Softwares <ul style="list-style-type: none"> • Operating system software • Word processor • Spread sheets • Databases • Presentation software • publisher software • browsers

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ENTREPRENEURIAL SKILLS

UNIT CODE: CON/CU/BUT/BC/03/5

Duration of unit: 70 HOURS

Relationship to occupational standards

This unit addresses the unit of competency: Apply entrepreneurial skills

Unit description

This unit describes competency required for a Building Technician to demonstrate entrepreneurial aptitudes. It involves, developing business innovation strategies, developing new markets, customer base, expanding employed capital and undertaking regional/county expansion while retaining motivated staff.

Summary of Learning Outcomes

1. To develop business innovation strategies
2. To develop new products/ markets and Marketing techniques
3. To expand customers and product lines
4. To motivate all staff/workers
5. To expand employed capital base
6. To undertake regional/county business expansion

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Develop business Innovation strategies	<ul style="list-style-type: none">• Innovation in business• Business innovation strategies• Creativity for business development• New technologies in entrepreneurship• Linkages with other entrepreneurs• Setting strategic directions• New ideas and approaches• Entrepreneurial skills development• Market trends• Monitoring and anticipating market trends• Products and processes in	<ul style="list-style-type: none">• Observation• Case studies• Individual/group assignments• projects• Written• Oral

Learning Outcome	Content	Suggested Assessment Methods
	entrepreneurship <ul style="list-style-type: none"> • Business conventions and exhibitions • Business growth refocus 	
2. Develop new products/markets and Marketing techniques	<ul style="list-style-type: none"> • Feasibility study for new products • Identifying new sources of raw material and resources • New target markets/customers • Increasing products and services • Marketing improvement • Intrapreneurship and business growth 	<ul style="list-style-type: none"> • Observation • Case studies • Individual/group assignments • projects • Written • Oral
3. Expand customers and product lines	<ul style="list-style-type: none"> • Market demand • Regulatory environment • Creating product and services competitive advantages • Creating loyal client base • Identifying and maintain new customers and markets • Advance product/ service promotions • Advance market expansion • Small business records management • Book keeping and auditing for small businesses • Computer application software and programmes • ICT in customer and product diversification 	<ul style="list-style-type: none"> • Oral • Observation • Case studies • Individual/group assignments • projects • Written
4. Motivate staff/workers	<ul style="list-style-type: none"> • Motivation of workers • Communication at workplace for motivation purpose • Problem solving • Conflict resolution at place of work • Good relation between staff or workers • Team building and team work • Staff development and 	<ul style="list-style-type: none"> • Observation • Case studies • Individual/group assignments • projects • Written

Learning Outcome	Content	Suggested Assessment Methods
	enhancement • Culture of continuous improvement	
5. Expand employed capital base	• Employed capital in business • Business share holdings • Types of shares • Shares diversification • Role of shareholders • Intrapreneurship • Increasing products and services	• Observation • Case studies • Individual/group assignments • projects • Written • Oral
6. Undertake regional expansion county/business	• Region/ county identification process • Regional/ county laws and regulation • Business regional/county expansion • Regional/ County business expansion • Innovation in business • Business expansion and diversification • Resources for regional/county expansion • Small business Strategic Plan • Computer software in business development • ICT and business growth	• Observation • Case studies • Individual/group assignments • projects • Written • Oral

Suggested Methods of Instruction

- Theory sessions led by the Instructor in class
- Group and individual learning activities
- Practical demonstration of task by trainer
- Practical sessions for trainees
- Role play
- Site visits/benchmarks
- Simulation
- Project/research assignments
- Intervention of external speakers

Recommended Resources for 25 Trainees

- 25 mobile phones
- 25 Laptop/ desktop computers
- 2 Projectors
- Writing materials
- 25 Case studies for small businesses
- 5 Business plan templates
- Internet
- Relevant textbooks and eBooks
- 5 business Journals
- 10 Magazines
- 5 Training manuals
- 5 Case studies

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EMPLOYABILITY SKILLS

UNIT CODE: CON/CU/BUT/BC/04/5

UNIT DURATION: 60 HOURS

Relationship to Occupational Standards

This unit addresses the Unit of Competency: Apply Employability Skills

Unit Description

This unit covers competencies required to apply employability skills. It involves conducting self-management, demonstrating interpersonal communication, critical safe work habits, leading a workplace team, planning and organizing work, maintaining professional growth and development, demonstrating workplace learning, problem solving skills and managing ethical performance.

Summary of Learning Outcomes

1. To conduct self-management
2. To apply critical safe work habits
3. To Apply leadership skills in workplace
4. To Plan and organize workplace activities.
5. To maintain professional growth and development
6. To apply learning, creativity and innovativeness in the workplace

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Conduct self-management	<ul style="list-style-type: none">• Self-awareness• Formulating personal vision, mission and goals• Strategies for overcoming life challenges• Managing emotions• Emotional intelligence• Assertiveness versus aggressiveness• Expressing personal thoughts, feelings and beliefs• Developing and maintaining	<ul style="list-style-type: none">• Written tests• Oral questioning• Interviewing• Portfolio of evidence• Third party report

	<p>high self-esteem</p> <ul style="list-style-type: none"> • Developing and maintaining positive self-image • Setting performance targets • Monitoring and evaluating performance • Articulating ideas and aspirations • Accountability and responsibility • Good work habits • Self-awareness • Values and beliefs • Self-development • Financial literacy • Healthy lifestyle practices • Adopting safety practices 	
2. Applying critical safe work habits in the workplace.	<ul style="list-style-type: none"> • Stress and stress management • Time concept • Punctuality and time consciousness • Leisure • Integrating personal objectives into organizational objectives • Resources mobilization • Resources utilization • Setting work priorities • Developing healthy relationships • HIV and AIDS • Drug and substance abuse • Managing emerging issues 	<ul style="list-style-type: none"> • Written tests • Oral questioning • Interviewing • Portfolio of evidence • Third party report
3. Applying leadership skills in workplace	<ul style="list-style-type: none"> • Leadership qualities • Power and authority • Team building • Determination of team roles and objectives • Team parameters and 	<ul style="list-style-type: none"> • Written tests • Oral questioning • Interviewing • Portfolio of evidence • Third party report

	<p>relationships</p> <ul style="list-style-type: none"> • Individual responsibilities in a team • Forms of communication • Complementing team activities • Gender and gender mainstreaming • Human rights • Developing healthy relationships • Maintaining relationships • Conflicts and conflict resolution • Coaching and mentoring skills 	
<p>4. Planning and organizing workplace activities.</p>	<ul style="list-style-type: none"> • Functions of management • Planning • Organizing • Time management • Decision making concept • Task allocation • Developing work plans • Developing work goals/objectives and deliverables • Monitoring work activities • Evaluating work activities • Resource mobilization • Resource allocation • Resource utilization • Proactive planning • Risk evaluation • Problem solving • Collecting, analysing and organising information • Negotiation 	<ul style="list-style-type: none"> • Written tests • Oral questioning • Interviewing • Portfolio of evidence • Third party report

<p>5.Maintaining professional growth and development</p>	<ul style="list-style-type: none"> • Avenues for professional growth • Training and career opportunities • Assessing training needs • Mobilizing training resources • Licenses and certifications for professional growth and development • Pursuing personal and organizational goals • Managing work priorities and commitments • Recognizing career advancement 	<ul style="list-style-type: none"> • Written tests • Oral questioning • Interviewing • Portfolio of evidence • Third party report
<p>5.Applying workplace learning</p>	<ul style="list-style-type: none"> • Managing own learning • Mentoring • Coaching • Contributing to the learning community at the workplace • Cultural aspects of work • Networking • Variety of learning context • Application of learning • Safe use of technology • Taking initiative/proactivity • Flexibility • Identifying opportunities • Generating new ideas • Workplace innovation • Performance improvement • Managing emerging issues • Future trends and concerns in learning 	<ul style="list-style-type: none"> • Written tests • Oral questioning • Interviewing • Portfolio of evidence • Third party report
<p>6.Apply learning, creativity and innovativeness in the workplace</p>	<ul style="list-style-type: none"> • Meaning of ethics • Ethical perspectives • Principles of ethics • Ethical standards • Organization code of ethics 	<ul style="list-style-type: none"> • Written tests • Oral questioning • Interviewing • Portfolio of evidence • Third party report

	<ul style="list-style-type: none"> • Common ethical dilemmas • Organization culture • Corruption, bribery and conflict of interest • Privacy and data protection • Diversity, harassment and mutual respect • Financial responsibility/accountability • Etiquette • Personal and professional integrity • Commitment to jurisdictional laws • Emerging issues in ethics 	
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Suggested Methods of Instruction

- Demonstrations
- Simulation/Role play
- Group Discussion
- Presentations
- Assignments
- Q&A

Recommended Resources for 25 Trainees

General Resources	Tools and Equipment	Materials and Supplies
<ul style="list-style-type: none"> • class room • Writing boards 	<ul style="list-style-type: none"> • 25 Computers • 25 sets of Stationery • 10 flip Charts • Various Video clips relevant to content • 25 Audio tapes • 1 Radio sets • 1 TV sets • Tools and Equipment • 1 LCD projectors 	<ul style="list-style-type: none"> • Newspapers (old and new) based on need • Journals (old and current) based on need

ENVIRONMENTAL LITERACY

UNIT CODE: CON/CU/BUT/BC/05/5

Duration of Unit: 70 HOURS

Relationship to Occupational Standards:

This unit addresses the unit standard: **Apply environmental literacy**

Unit Description

This unit describes competency required for a Building Technician to comply with environmental protection and hazard control procedures as per environmental legislations and conventions.

Summary of Learning Outcomes

1. To control environmental hazard
2. To control environmental Pollution
3. To demonstrate sustainable resource use
4. To evaluate current practices in relation to resource usage
5. To identify Environmental legislations/conventions for environmental concerns
6. To implement specific environmental programs
7. To monitor activities on Environmental protection/Programs
8. To analyze resource use
9. To develop resource conservation plans

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Control environmental hazard	<ul style="list-style-type: none">• Purposes and content of Environmental Management and Coordination Act 1999• Storage methods for environmentally hazardous materials• Disposal methods of hazardous wastes• Types and uses of PPE in line with environmental regulations• Occupational Safety and Health Standards (OSHS)	<ul style="list-style-type: none">• Written questions• Oral questions• Observation of work procedures

Learning Outcome	Content	Suggested Assessment Methods
2. Control environmental Pollution	<ul style="list-style-type: none"> • Types of pollution • Environmental pollution control measures • Types of solid wastes • Procedures for solid waste management • Different types of noise • Methods for minimizing noise 	<ul style="list-style-type: none"> • Written questions • Oral questions • Observation of work procedures • Role play
3. Demonstrate sustainable resource use	<ul style="list-style-type: none"> • Types of resources • Techniques in measuring current usage of resources • Calculating current usage of resources • Methods for minimizing wastage • Waste management procedures • Principles of 3Rs (Reduce, Reuse, Recycle) • Methods for economizing or reducing resource consumption 	<ul style="list-style-type: none"> • Written questions • Oral questions • Observation of work procedures • Role play
4. Evaluate current practices in relation to resource usage	<ul style="list-style-type: none"> • Collection of information on environmental and resource efficiency systems and procedures (NEMA) • Measurement and recording of current resource usage (EIA, IEE) • Analysis and recording of current purchasing strategies. • Analysis of current work processes to access information and data • Identification of areas for improvement 	<ul style="list-style-type: none"> • Written questions • Oral questions • Observation of work procedures • Role play
5. Identify Environmental legislations/conventions for environmental concerns (NEMA,	<ul style="list-style-type: none"> • Environmental issues/concerns • Environmental legislations /conventions and local ordinances • Industrial standard /environmental practices 	<ul style="list-style-type: none"> • Written questions • Oral questions • Observation of work procedures

Learning Outcome	Content	Suggested Assessment Methods
EIA, IEE)	<ul style="list-style-type: none"> • International Environmental Protocols (Montreal, Kyoto) • Features of an environmental strategy 	
6. Implement specific environmental programs	<ul style="list-style-type: none"> • Community needs and expectations • Resource availability • 5s of good housekeeping • Identification of programs/Activities • Setting of individual roles /responsibilities • Resolving problems /constraints encountered • Consultation with stakeholders 	<ul style="list-style-type: none"> • Written questions • Oral questions • Observation of work procedures • Role play
7. Monitor activities on Environmental protection/Programs	<ul style="list-style-type: none"> • Periodic monitoring and Evaluation of activities • Gathering feedback from stakeholders • Analysing data gathered • Documentation of recommendations and submission • Setting of management support systems to sustain and enhance the program • Monitoring and reporting of environmental incidents to concerned /proper authorities 	<ul style="list-style-type: none"> • Oral questions • Written tests • Practical test • Observation
8. Analyze resource use	<ul style="list-style-type: none"> • Identification of resource consuming processes • Determination of quantity and nature of resource consumed • Analysis of resource flow through different parts of the process. • Classification of wastes for possible source of resources. 	<ul style="list-style-type: none"> • Written tests • Oral questions • Practical test • Observation

Learning Outcome	Content	Suggested Assessment Methods
9. Develop resource Conservation plans	<ul style="list-style-type: none"> • Determination of efficiency of use/conversion of resources • Causes of low efficiency of use of resources • Plans for increasing the efficiency of resource use 	<ul style="list-style-type: none"> • Written tests • Oral questions • Practical test • Observation

Suggested Methods of Instruction

- Theory sessions led by the Instructor in class
- Group and individual learning activities
- Practical demonstration of task by trainer
- Practical sessions for trainees
- Role play
- Site visits/benchmarks
- Simulation

Recommended Resources for 25 Trainees:

General Resources	Tools and Equipment	Materials and supplies
<ul style="list-style-type: none"> • Standard operating and/or other workplace procedures manuals (Safe working procedure manuals, waste management manual, manual handling procedures, risk assessment manuals) • Specific job procedures manuals • Environmental Management and Coordination Act (Amendment)2015 • Machine/equipment manufacturer's specifications and instructions 	<ul style="list-style-type: none"> • 25 Computers, 1Projector • 25 Microscopes • 5 pH Metres • 1 Turbid metre • 1 Secchi Disc • 1 Sample prep equipment • 1 Refract meters • 1 Equipment biofuel analysers • 5 Balances • 5 Evaporators, and stability Chambers • 5 GC-systems/Spectrometry • 1 HPLC systems for carbamate and explosives analysis. • 25 GPS • 5 Soil and Water Kit • 1 Decibel Meter • 5 Soil auger • 1 Radiometer/Geiger counters • 25 Android phones/Digital cameras • Internet 	<ul style="list-style-type: none"> • Laboratory specimen • Laboratory Chemicals • Filter papers • Dust Bins • Cleaning materials, trash bags

OCCUPATIONAL SAFETY AND HEALTH PRACTICES

UNIT CODE:CON/CU/BUT/BC/06/5

Duration of Unit: 70 HOURS

Relationship to Occupational Standards

This unit addresses the unit of competency: Apply occupational safety and health practices

Unit Description

This unit describes the competencies required to comply with regulatory and organizational requirements for occupational safety and health.

Summary of Learning Outcomes

1. To identify workplace hazards and risk
2. To identify and implement appropriate control measures to hazards and risks
3. To implement OSH programs, procedures and policies/guidelines

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Identify workplace hazards and risks	<ul style="list-style-type: none">• Identification of hazards in the workplace and/or the indicators of their presence• Evaluation and/or work environment measurements of OSH hazards/risk existing in the workplace• Gathering of OSH issues and/or concerns	<ul style="list-style-type: none">• Oral questions• Written tests• Observation of trainees identify hazards and risks
2. Identify and implement appropriate control measure to hazards and risks	<ul style="list-style-type: none">• Prevention and control measures e.g. use of PPE• Contingency measures	<ul style="list-style-type: none">• Oral questions• Written tests• Practical tests• Observation of implementation of control measures
3. Implement OSH programs, procedures	<ul style="list-style-type: none">• Company OSH program, procedures and policies/guidelines	<ul style="list-style-type: none">• Oral questions• Written tests

and policies/guidelines	<ul style="list-style-type: none"> • Implementation of OSH procedures and policies/ guidelines • Training of team members and advice on OSH standards and procedures • Implementation of procedures for maintaining OSH-related records 	<ul style="list-style-type: none"> • Practical test • Observation
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Suggested Delivery Methods

- Instructor led facilitation of theory
- Demonstration by trainer
- Practical work by trainee
- Viewing of related videos

Recommended Resources for 25 Trainees

General Resources	Tools and Equipment	Materials and supplies
<ul style="list-style-type: none"> • Standard operating and/or other workplace procedures manuals-5 • Specific job procedures manuals-5 • Machine/equipment manufacturer’s specifications and instructions-5 • Personal Protective Equipment (PPE) e.g. <ul style="list-style-type: none"> • Mask-25 • Face mask/shield-25 • Safety boots-25 • Safety harness-25 • Arm/Hand guard, gloves-25 • Eye protection (goggles, shield)-25 • Hearing protection (ear muffs, ear plugs)-25 • Hair Net/cap/bonnet-25 • Helmet-25 • Face protection (mask, shield)-25 • Apron/Gown/coverall/jump suit-25 	<ul style="list-style-type: none"> • Mask -25 • Face mask/shield-25 • Safety boots-25 • Safety harness-access • Arm/Hand guard, gloves-25 • Eye protection (goggles, shield)-25 • Hearing protection (ear muffs, ear plugs)-25 • Hair Net/cap/bonnet-25 • Helmet-25 • Face protection (mask, shield)-25 • Apron/Gown/coverall/jump suit-25 • Anti-static suits-25 • High-visibility reflective vest-25 • First aid kits-5 • Fire fighting equipment-2 • Physical infrastructures-2 	<ul style="list-style-type: none"> • Standard operating and/or other workplace procedures manuals-5 • Specific job procedures manuals-5 • Machine/equipment manufacturer’s specifications and instructions-5

<ul style="list-style-type: none"> • Anti-static suits-25 • High-visibility reflective vest-25 • Fire assembly points-2 • Social amenities eg 5,000L of water,100kv of electricity and 5 latrines • Internet connectivity-200GB • Physical infrastructures-5 • Periodicals-2 	<ul style="list-style-type: none"> • Computers-25 	
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COMMON UNITS OF COMPETENCY

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BASIC MATHEMATICS

UNIT CODE: CON/CU/BUT/CU/01/5

UNIT DURATION: 120 HOURS

Relationship to Occupational Standards

This unit addresses the unit of competency: Apply engineering mathematics

Unit Description

This unit describes the competencies required by a technician in order to apply algebra apply trigonometry and hyperbolic functions, apply complex numbers, apply coordinate geometry, carry out binomial expansion, apply calculus, solve ordinary differential equations, carry out mensuration, apply power series, apply statistics, apply numerical methods, apply vector theory and apply matrix.

Summary of Learning Outcomes

1. To apply Algebra
2. To apply Trigonometry and hyperbolic functions
3. To apply complex numbers
4. To apply Coordinate Geometry
5. To carry out Binomial Expansion
6. To apply Calculus
7. To solve Ordinary differential equations
8. To carry out Mensuration
9. To apply Power Series
10. To apply Statistics
11. To apply Numerical methods
12. To apply Vector theory
13. To apply Matrix

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Apply Algebra	<ul style="list-style-type: none"> • Base and Index • Law of indices • Indicial equations • Laws of logarithm • Logarithmic equations • Conversion of bases • Use of calculator • Reduction of equations • Solution of equations reduced to quadratic form • Solutions of simultaneous linear equations in three unknowns • Solutions of problems involving AP and GP 	<ul style="list-style-type: none"> • Written assessment • Oral assessment • Observation • Portfolio of Evidence • Third party report
2. Apply Trigonometry and hyperbolic functions	<ul style="list-style-type: none"> • Half -angle formula • Factor formula • Trigonometric functions • Parametric equations • Relative and absolute measures • Measures calculation • Definition of hyperbolic equations • Properties of hyperbolic functions • Evaluations of hyperbolic functions • Hyperbolic identities • Osborne’s Rule • $Ashx+bshx=C$ equation • One-to-one relationship in functions • Inverse functions for one-to-one relationship • Inverse functions for trigonometric functions • Graph of inverse functions • Inverse hyperbolic functions 	<ul style="list-style-type: none"> • Written assessment • Oral assessment • Observation • Portfolio of Evidence • Third party report

<p>3. Apply complex numbers</p>	<ul style="list-style-type: none"> • Definition of complex numbers • Stating complex numbers in numbers in terms of conjugate argument and Modulus • Representation of complex numbers on the Argand diagram • Arithmetic operation of complex numbers Application of De Moivre's theorem • Application of complex numbers to engineering 	<ul style="list-style-type: none"> • Written assessment • Oral assessment • Observation • Portfolio of Evidence • Third party report
<p>4. Apply Coordinate Geometry</p>	<ul style="list-style-type: none"> • Polar equations • Cartesian equation • Graphs of polar equations • Normal and tangents • Definition of a point • Locus of a point in relation to a circle • Loci of points for given mechanism 	<ul style="list-style-type: none"> • Written assessment • Oral assessment • Observation • Portfolio of Evidence • Third party report
<p>5. Carry out Binomial Expansion</p>	<ul style="list-style-type: none"> • Binomial theorem Power series using binomial theorem Roots of numbers using binomial theorem. • Estimation of errors of small changes using binomial theorem. 	<ul style="list-style-type: none"> • Written assessment • Oral assessment • Observation • Portfolio of Evidence • Third party report
<p>6. Apply Calculus</p>	<ul style="list-style-type: none"> • Definition of derivatives of a function • Differentiation from first principle • Tables of some common derivatives • Rules of differentiation • Rate of change and small change • Stationery points of functions of two variables • Definition of integration • Indefinite and definite integral • Methods of integration application of integration. • Integrals of hyperbolic and inverse functions 	<ul style="list-style-type: none"> • Written assessment • Oral assessment • Observation • Portfolio of Evidence • Third party report

<p>7. Solve Ordinary differential equations</p>	<ul style="list-style-type: none"> • Types of first order differential equations • Formation of first order differential equation • Solution of first order differential equations • Application of first order differential equations • Formation of second order differential equations for various systems • Solution of second order differential equations • Application of second order differential equations 	<ul style="list-style-type: none"> • Written assessment • Oral assessment • Observation • Portfolio of Evidence • Third party report
<p>8. Carry out Mensuration</p>	<ul style="list-style-type: none"> • Units of measurements • Perimeter and areas of regular figures • Volume of regular solids • Surface area of regular solids • Area of irregular figures • Areas and volumes using Pappus theorem 	<ul style="list-style-type: none"> • Written assessment • Oral assessment • Observation • Portfolio of Evidence • Third party report
<p>9. Apply Power Series</p>	<ul style="list-style-type: none"> • Definition of the term power series • Taylor's theorem • Deduction of McLaurin's theorem to obtain power series • Application of Taylor's theorem and McLaurin's theorems in numerical work 	<ul style="list-style-type: none"> • Written assessment • Oral assessment • Observation • Portfolio of Evidence • Third party report
<p>10. Apply Statistics</p>	<ul style="list-style-type: none"> • Measures of central tendency mean, mode and median • Measures of dispersion Variance and standard deviation • Definition of probability • Laws of probability 	<ul style="list-style-type: none"> • Written assessment • Oral assessment • Observation • Portfolio of Evidence • Third party report

	<ul style="list-style-type: none"> • Expectation variance and S.D. • Types of distributions • Mean, variance and SD of probability distributions • Application of probability distributions 	
11. Apply Numerical methods	<ul style="list-style-type: none"> • Definition of interpolation and extrapolation • Application of interpolation • Application of interactive methods to solve equations • Application of interactive methods to areas and volumes 	<ul style="list-style-type: none"> • Written assessment • Oral assessment • Observation • Portfolio of Evidence • Third party report
12. Apply Vector theory	<ul style="list-style-type: none"> • Vectors and scalar in two and three dimensions • Operations on vectors: Addition and Subtraction • Position vectors • Resolution of vectors 	<ul style="list-style-type: none"> • Written assessment • Oral assessment • Observation • Portfolio of Evidence • Third party report
13. Apply Matrix methods	<ul style="list-style-type: none"> • Matrix operation • Determinant of 3x3 matrix • Inverse of 3x3 matrix • Solution of linear simultaneous equations in 3 unknown • Application of matrices 	<ul style="list-style-type: none"> • Written assessment • Oral assessment • Observation • Portfolio of Evidence • Third party report

Suggested Methods of Instruction

- Group discussions
- Demonstration by trainer
- Exercises by trainee

Recommended Resources for 25 Trainees

- 25 Scientific Calculators
- 25 Rulers, pencils, erasers
- 25 Charts with presentations of data
- 25 Graph books
- 25 Dice
- 25 Computers with internet connection

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TECHNICAL DRAWING

UNIT CODE: CON/CU/BUT/CU/02/5

Duration of Unit: 120 HOURS

Relationship to Occupational Standards

This unit addresses the unit of competency: Prepare and interpret technical drawings

Unit Description

This unit covers the competencies required to prepare and interpret technical drawings. It involves competencies to select, use and maintain drawing equipment and materials. It also involves producing plain geometry drawings, solid geometry drawings, pictorial and orthographic drawings of components and application of Computer Aided Design (CAD) packages.

Summary of Learning Outcomes

1. To use and maintain drawing equipment and materials
2. To produce plane geometry drawings
3. To produce solid geometry drawings
4. To produce pictorial and orthographic drawings of components
5. To apply CAD packages

Learning Outcomes, Content and Suggested Assessment Methods:

Learning Outcome	Content	Suggested Assessment Methods
1. Use and maintain drawing equipment and materials	<ul style="list-style-type: none">• Identification and care of drawing equipment• Identification and care of drawing materials• Reference to manufacturer's instructions and work place procedures on use and maintenance of drawing equipment and materials• Reference to relevant environmental legislations• Use of Personal Protective Equipment (PPEs)	<ul style="list-style-type: none">• Observation• Oral assessment• Practical• Portfolio of Evidence• Written assessment
2. Produce plane geometry	<ul style="list-style-type: none">• Types of lines in drawings• Construction of geometric forms e.g.	<ul style="list-style-type: none">• Observation• Oral assessment

drawings	<ul style="list-style-type: none"> squares, circles • Construction of different angles • Measurement of different angles • Bisection of different angles and lines • Standard drawing conventions 	<ul style="list-style-type: none"> • Practical • Project • Portfolio of Evidence • Written assessment • Observation
3. Produce solid geometry drawings	<ul style="list-style-type: none"> • Interpretation of sketches and drawings of patterns e.g. cylinders, prisms and pyramids • Sectioning of solids e.g. prisms, cones • Development and interpenetrations of solids e.g. cylinder to cylinder and cylinder to triangular, prism 	<ul style="list-style-type: none"> • Observation • Oral assessment • Practical • Project • Portfolio of Evidence • Written assessment
4. Produce orthographic drawings	<ul style="list-style-type: none"> • Meaning of pictorial and orthographic drawings • Meaning of sectioning • Meaning of symbols and abbreviations • Drawing and interpretation of orthographic elevations • Dimensioning of orthographic elevations • Sectioning of views 	<ul style="list-style-type: none"> • Observation • Oral assessment • Practical • Project • Portfolio of Evidence • Written assessment
5. Produce pictorial drawings	<ul style="list-style-type: none"> • Meaning of pictorial drawings • Drawing objects in isometric view • Drawing objects in oblique view 	<ul style="list-style-type: none"> • Observation • Oral assessment • Practical • Project • Portfolio of Evidence • Written assessment
6. Apply CAD packages	<ul style="list-style-type: none"> • Identification of CAD packages e.g. AutoCAD, circuit maker • Use of CAD packages in drawing of: <ul style="list-style-type: none"> - Plane geometry - Solid 	<ul style="list-style-type: none"> • Observation • Oral assessment • Practical • Project • Portfolio of Evidence

	<ul style="list-style-type: none">- Orthographic- Pictorial	<ul style="list-style-type: none">• Written assessment
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Suggested Methods of Instruction

- Projects
- Demonstration by trainer
- Practice by the trainee
- Discussions
- Simulation
-

Recommended Resources for 25 Trainees

- 2 Drawing rooms
- 25 sets Drawing instruments e.g. T-squares, set squares, drawing sets
- 25 Drawing tables
- Assorted Pencils, papers, erasers
- Assorted Masking tapes
- 10 Computers installed with relevant CAD packages

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CORE UNITS OF COMPETENCY

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EXECUTING SITE PRELIMINARY WORKS

UNIT CODE: CON/CU/BUT/CR/01/5

UNIT DURATION: 40Hours

Relationship to Occupational Standards

This unit addresses the Unit of Competency: Execute site preliminary works

Unit Description

This Unit describes the competencies required to perform site preliminary works. It involves Interpret building drawings, prepare construction site, execute earthworks and Install site utilities.

Summary of Learning Outcomes

1. To clear building site
2. To erect Hoard/Fence construction
3. To lay out the building site
4. To interpret building drawing
5. To set out a building structure

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Clearing building site	<ul style="list-style-type: none">• Site clearance:<ul style="list-style-type: none">- Demarcation- Demolition- Grabbing of shrubs- Diversion of water channels and services- Site stripping- Trim hedges• Tools and equipment• Site plan layout	<ul style="list-style-type: none">• Written assessment• Practical• Projects• Oral assessment• Portfolio of Evidence

Erect Hoard/Fence construction	<ul style="list-style-type: none"> • Site hoarding • Tools and equipment • Materials for fencing/hoarding <ul style="list-style-type: none"> - Iron sheets - Timber - Chain link - Steel - Concrete 	<ul style="list-style-type: none"> • Written assessment • Practical • Projects • Oral assessment • Portfolio of Evidence
Lay out the building site	<ul style="list-style-type: none"> • Site utilities <ul style="list-style-type: none"> - Site office - Material store - Offices - Wash rooms - Access roads • Services <ul style="list-style-type: none"> - Water point - Power station - Health services 	<ul style="list-style-type: none"> • Written assessment • Practical • Projects • Oral assessment • Portfolio of Evidence
Interpret building drawing	<ul style="list-style-type: none"> • Components of building drawing <ul style="list-style-type: none"> - Plan - Sections - Elevations 	<ul style="list-style-type: none"> • Written assessment • Practical • Projects • Oral assessment • Portfolio of Evidence
set out a building structure	<ul style="list-style-type: none"> • Setting out methods <ul style="list-style-type: none"> - 3-4-5 Method - Builders square - Theodolite 	<ul style="list-style-type: none"> • Written assessment • Practical • Projects • Oral assessment • Portfolio of Evidence

Suggested Methods of Instruction

- Discussion
- Direct Instruction
- Lecture
- Question and answer

- Site visits
- Practicals

Recommended Resources for 25 Trainees

- Drawing instruments
- 10 Desktop computers/laptops
- 25 Tape measures
- 1 Projector
- 1 Whiteboard
- 1 roll Flip Chart
- 5 Assorted color of whiteboard markers

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EXECUTING SUBSTRUCTURE WORKS

UNIT CODE: CON/CU/BUT/CR/02/5

UNIT DURATION: 80 Hours

Relationship to Occupational Standards

This unit addresses the Unit of Competency: Execute substructure works

Unit Description

This Unit describes the competencies required to execute substructure works. It involves excavating, levelling and concreting foundation trenches, constructing foundation wall and solid ground floor.

Summary of Learning Outcomes

1. To excavate Foundation trenches
2. To level foundation trenches
3. To concrete foundation trenches
4. To construct foundation wall
5. To construct solid ground floor

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Excavate foundation trenches	<ul style="list-style-type: none">• Types of soil• Excavation depths• Methods of Excavation• Excavation plant, tools and equipment• Foundation trenches• Safety barriers	<ul style="list-style-type: none">• Written assessment• Practical• Projects• Oral assessment• Portfolio of Evidence
2. Level foundation trenches	<ul style="list-style-type: none">• Leveling foundation trench• Planking and strutting materials• Methods of planking and strutting• Dewatering methods	<ul style="list-style-type: none">• Written assessment• Practical• Projects• Oral assessment• Portfolio of Evidence

<p>3. Concrete foundation trenches</p>	<ul style="list-style-type: none"> • Mixing materials <ul style="list-style-type: none"> - Cement - Aggregates • Concrete mixing tools and equipment • Preparation method of concrete mix • Methods of placing concrete • Curing of concrete 	<ul style="list-style-type: none"> • Written assessment • Practical • Projects • Oral assessment • Portfolio of Evidence
<p>4. Construct foundation wall</p>	<ul style="list-style-type: none"> • Service pipes • Setting out of foundation walls • Construction of foundation wall • Foundation back filling 	<ul style="list-style-type: none"> • Written assessment • Practical • Projects • Oral assessment • Portfolio of Evidence
<p>5. Construct solid ground floor</p>	<ul style="list-style-type: none"> • Ground floor and termite treatment • Levelling and compaction of floor base • Ground floor components • Hardcore • Damp proofing materials • BRC mesh • Service receptors • Formwork to edges • Ground floor slab construction 	<ul style="list-style-type: none"> • Written assessment • Practical • Projects • Oral assessment • Portfolio of Evidence

Suggested Methods of Instruction

- Discussion
- Direct Instruction
- Lecture
- Question and answer
- Site visits
- Practicals

Recommended Resources for 25 Trainees

- 10 Desktop computers/laptops
- 50 Wooden pegs

- 25 Builder's square
- 25 Tape measures
- Assorted Hand Tools and implements
- 2 Projector
- 5 Whiteboard
- 10 roll Flip Chart
- Assorted colour of whiteboard markers
- White lime
- Building stones
- Timber

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EXECUTING SUPERSTRUCTURE WORKS

UNIT CODE: CON/CU/BUT/CR/03/5

UNIT DURATION: 120Hours

Relationship to Occupational Standards

This unit addresses the Unit of Competency: Execute superstructure works.

Unit Description

This Unit describes the competencies required to execute superstructure works. It involves setting out and constructing superstructure walls and columns, setting out and casting superstructure beams and suspended slabs, and constructing stair structure.

Summary of Learning Outcomes

1. To set out walls and columns
2. To construct superstructure wall and columns
3. To set out superstructure beams and suspended slabs
4. To construct stair structure
5. To cast suspended slab and beams

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Set out walls and columns	<ul style="list-style-type: none"> • Methods of setting out • Tools for setting out • Kickers 	<ul style="list-style-type: none"> • Written assessment • Practical • Projects • Oral assessment • Portfolio of Evidence
2. Construct superstructure wall and columns	<ul style="list-style-type: none"> • Construction of columns and walls • DPC • Wall openings • Props • Concrete materials • Placing and compaction of concrete • Curing of concrete 	<ul style="list-style-type: none"> • Written assessment • Practical • Projects • Oral assessment • Portfolio of Evidence
3. Set out superstructure beams and suspended slabs	<ul style="list-style-type: none"> • Levels • Formwork construction 	<ul style="list-style-type: none"> • Written assessment • Practical • Projects • Oral assessment • Portfolio of Evidence

4. Construct stair structure	<ul style="list-style-type: none"> • Types of stairs • Construction of stairs • Curing of stair 	<ul style="list-style-type: none"> • Written assessment • Practical • Projects • Oral assessment • Portfolio of Evidence
5. Cast suspended slab and beams	<ul style="list-style-type: none"> • Reinforcement bars • Concrete material <ul style="list-style-type: none"> - Cement - Aggregates • Cast beams and slabs 	<ul style="list-style-type: none"> • Written assessment • Practical • Projects • Oral assessment • Portfolio of Evidence

Suggested Methods of Instruction

- Discussion
- Direct Instruction
- Project
- Practical
- Question and answer
- Visits to construction site
- Simulations
-

Recommended Resources for 25 Trainees

- 10 Desktop computers/laptops
- 25 Builder's square
- 25 Tape measures
- Hand Tools and implements
- Marine boards
- 2 Projector
- 5 Whiteboards
- 10 roll Flip Chart
- Assorted colour of whiteboard markers
- Building stones
- Timber
- Reinforcement bars
- Tools and equipment
 - 10 Spade
 - 5 Wheelbarrows
 - 25 sets of Painting brushes
 - 25 Trowels
 - 25 Spirit levels
 - 25 assorted Screw drivers
 - 25 Hammers

- 25 Plumb bobs
- 25 Wooden float
- 25 Steel float
- 25 Head pans

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ROOF CONSTRUCTION

UNIT CODE: CON/CU/BUT/CR/04/5

UNIT DURATION: 40 Hours

Relationship to Occupational Standards

This unit addresses the Unit of Competency: Construct roof structure

Unit Description

This Unit describes the competencies required to execute roof construction. It involves: Identifying type of roof, interpreting roof plan, performing setting out, constructing trusses and executing roof finishes.

Summary of Learning Outcomes

1. To identify and interpret type of roof
2. To perform setting out
3. To construct trusses
4. To execute roof finishes

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Identify and interpret type of roof	<ul style="list-style-type: none">• Type of roof• Members of roof• Roof covering materials	<ul style="list-style-type: none">• Written assessment• Practical• Projects• Oral assessment
2. Perform setting out	<ul style="list-style-type: none">• Method of setting out• Tools and equipment	<ul style="list-style-type: none">• Written assessment• Practical• Projects• Oral assessment
3. Construct trusses	<ul style="list-style-type: none">• Joints of truss• Members of truss	<ul style="list-style-type: none">• Written assessment• Practical• Projects• Oral assessment
4. Execute roof finishes	<ul style="list-style-type: none">• Fascia boards• Roof coverings• Rain water goods	<ul style="list-style-type: none">• Written assessment• Practical• Projects• Oral assessment

Suggested Methods of Instruction

- Discussion
- Direct Instruction
- Lecture
- Question and answer
- Site visits
- Practicals

Recommended Resources for 25 Trainees

- 10 Desktop computers/laptops
- 2 Projector
- 5 Whiteboard
- 10 roll Flip Chart
- Assorted color of whiteboard markers
- Assorted Tools and equipment
- Timber
- Hoop iron
- 10 Iron sheets
- 25 Tape measures

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INSTALLATION OF DOORS AND WINDOWS

UNIT CODE: CON/CU/BUT/CR/05/5

UNIT DURATION: 40 Hours

Relationship to Occupational Standards

This unit addresses the Unit of Competency: Install doors and windows

Unit Description

This unit describes the competencies required to install doors and windows. It involves installing door and window frames, constructing and fixing door and windows.

Summary of Learning Outcomes

1. Install door and window frames
2. To construct and fix door and window

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Install door and window frames	<ul style="list-style-type: none"> • Preparation of window schedule • Preparation of openings • Windows, doors and grilled openings dimensions • Fixing door and window frames 	<ul style="list-style-type: none"> • Written assessment • Practical • Project • Portfolio of Evidence • Oral assessment •
2. Construct and fix door and window shutters	<ul style="list-style-type: none"> • Types of doors <ul style="list-style-type: none"> -Battened -Pannel -Sliding -Battened framed & ledged -Flush -Louvered • Types of windows <ul style="list-style-type: none"> -Steel casement -Louvered -Sliding -Sash • Fixing doors and window 	<ul style="list-style-type: none"> • Written assessment • Practical • Projects • Oral assessment • Portfolio of Evidence •
3. Fix iron mongery	<ul style="list-style-type: none"> • Types of iron mongary 	<ul style="list-style-type: none"> •

	<ul style="list-style-type: none"> • Interior door ironmongery • Front door ironmongery • Fire door ironmongery • Casement ironmongery • Sash window ironmongery • • Testing iron mongaries • Fastening iron mongaries 	
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Suggested Methods of Instruction

- Viewing of related videos
- Discussion
- Direct Instruction
- Lecture
- Question and answer
- Site visits
- Practical

Recommended Resources for 25 Trainees

- Drawing room
- 10 Desktop computers/laptops
- 25 Drawing tables
- Drawing papers
- Internet connection
- 2 Projector
- 1
- 5 Whiteboards
- 10 roll Flip Chart
- Assorted colour of whiteboard markers
- 2 Blueprinter
- Assorted Drawing instruments
- Assorted Hand tools
- Functional Carpentry workshop
- 5 boxes of Tiles
- 5 pieces Lining boards
- 5 bags Lime

PERFORMING BUILDING FINISHES

UNIT CODE: CON/CU/BUT/CR/06/5

UNIT DURATION: 60 Hours

Relationship to Occupational Standards

This unit addresses the Unit of Competency: perform building finishes

Unit Description

This unit describes the competencies required to perform building finishes. It involves performing wall plastering and rendering, applying floor finishes, executing ceiling finishes, applying paint finishes and installing fixtures and fittings.

Summary of Learning Outcomes

1. To perform wall plastering and rendering
2. To apply floor finishes
3. To execute ceiling finishes
4. To apply paint finishes
5. To install fixtures and fittings

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Perform wall plastering and rendering	<ul style="list-style-type: none">• Finishing materials• Finishing tools and equipment• wall finishes	<ul style="list-style-type: none">• Written assessment• Practical• Projects• Oral assessment
2. Apply floor finishes	<ul style="list-style-type: none">• Finishing materials• Finishing tools and equipment• Floor finishes	<ul style="list-style-type: none">• Written assessment• Practical• Projects• Oral assessment
3. Execute ceiling finishes	<ul style="list-style-type: none">• Ceiling finishes.• Application of Ceiling finishes	<ul style="list-style-type: none">• Written assessment• Practical• Projects• Oral assessment

4. Apply paint finishes	<ul style="list-style-type: none"> • Painting materials • Painting method. • Preparation of painting surface • Application of paint • Protection of painted surfaces 	<ul style="list-style-type: none"> • Written assessment • Practical • Projects • Oral assessment
5. Install fixtures and fittings	<ul style="list-style-type: none"> • Types of fixtures and fittings • Material schedule • Types of iron mongeries 	<ul style="list-style-type: none"> • Written assessment • Practical • Projects • Oral assessment

Suggested Methods of Instruction

- Discussion
- Direct Instruction
- Lecture
- Question and answer
- Site visits
- Practicals

Recommended Resources for 25 Trainees

- 10 Desktop computers/laptops
- 2 Projector
- 5 Whiteboard
- 10 roll Flip Chart
- Assorted colour of whiteboard markers
- Tools and equipment
 - 10 Spade
 - 5 Wheelbarrows
 - 25 assorted Painting brushes
 - 25 Trowels
 - 25 Spirit levels
 - 25 assorted Screw drivers
 - 25 Hammers
 - 25 Plumb bobs
 - 25 Wooden float
 - 25 Steel float
 - 25 Head pans
- Materials and supplies
 - 10 bags Cement

- Water
- 100 Bricks
- Wooden blocks
- 5 boxes Tiles
- 5 pieces Lining boards
- 5 bags Lime

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EXECUTING EXTERNAL WORKS

UNIT CODE: CON/CU/BUT/CR/07/5

UNIT DURATION: 60 Hours

Relationship to Occupational Standards

This unit addresses the Unit of Competency: execute external works

UNIT DESCRIPTION

This unit describes the competencies required to execute external works. It involves performing landscaping, constructing drainage system, laying external paving, and constructing gates and fences.

Summary of Learning Outcomes

1. To perform landscaping
2. To construct drainage system
3. To lay external paving
4. To construct gates and fences

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Perform landscaping	<ul style="list-style-type: none">• Preparation of landscaping ground• Landscape gardening• Irrigation method• Beautification	<ul style="list-style-type: none">• Written texts• Practical• Projects• Oral
2. Construct drainage system	<ul style="list-style-type: none">• Drainage channels• Backfilling leveling and compacting• Drainage pipes• Gulley traps	<ul style="list-style-type: none">• Written assessment• Practical• Projects• Oral
3. Lay external paving	<ul style="list-style-type: none">• Ground survey• Ground excavation• Base preparation• Levelling• Kerbs stones, surface drainage• Laying external paving• Marking	<ul style="list-style-type: none">• Written assessment• Practical• Projects• Oral

<p>4. Construct gates and fences</p>	<ul style="list-style-type: none"> • Gate location and orientation • Gate measurements • Gate supporting systems <ul style="list-style-type: none"> - RC columns - Stanchions - Stone Piers • Procurement and installation of the gate • Perimeter fence • Essential services <ul style="list-style-type: none"> - CCTVS cameras - security lighting - razor wire - Electric fence. 	<ul style="list-style-type: none"> • Written assessment • Practical • Projects • Oral
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Suggested Methods of Instruction

- Viewing of related videos
- Discussions
- Direct Instruction
- Lecture
- Question and answer
- Site visits
- Practicals
- Project

Recommended Resources for 25 Trainees

- 10 Desktop computers/laptops
- Internet connection
- 2 Projector
- 5 Whiteboard
- 10 roll Flip Chart
- Assorted colour of whiteboard markers
- Precast concrete kerbs
- Precast concrete paving units
- Quarry dust
- Sand
- Cement
- Ballast
- Construction tools
 - 10 Spade
 - 5 Wheelbarrows

- 25 assorted Painting brushes
- 25 Trowels
- 25 Spirit levels
- 25 assorted Screw drivers
- 25 Hammers
- 25 Plumb bobs
- 25 Wooden float
- 25 Steel float
- 25 Head pans

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