



REPUBLIC OF KENYA

COMPETENCY BASED CURRICULUM

FOR

ARCHITECTURAL DRAFTSMANSHIP

LEVEL 5



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 will contribute to achievement 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 Constitution and this resulted to the 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. This policy document requires 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 demand that Industry takes a leading role in Curriculum development to ensure the Curriculum addresses its competence needs. It is against this background that this Curriculum has been developed.

It is my conviction that this Curriculum will play a great role towards development of competent human resource for the Construction sector's growth and sustainable development.

**PRINCIPAL SECRETARY, VOCATIONAL AND TECHNICAL TRAINING
MINISTRY OF EDUCATION**

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. TVET has 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.

TVET Curriculum Development, Assessment and Certification Council (TVET CDACC) in conjunction with Construction Sector Skills Advisory Committee (SSAC) have developed this Curriculum.

This curriculum has been developed following the CBET framework policy; the CBETA standards and guidelines provided by the TVET Authority and the Kenya National Qualification Framework designed by the Kenya National Qualification Authority.

The Curriculum is designed and organized with an outline of learning outcomes; Suggested Methods of Instruction, training/learning resources and methods of assessing the trainee’s achievement. The Curriculum is competency-based and allows multiple entry and exit to the course.

I am grateful to the Council Members, Council Secretariat, Construction SSAC, expert workers and all those who participated in the development of this Curriculum.

CHAIRPERSON, TVET CDACC

ACKNOWLEDGEMENT

This Curriculum has been designed for competency-based training and has independent units of learning that allow the trainee flexibility in entry and exit. In developing the Curriculum, significant involvement and support was received from various organizations.

I recognize with appreciation the role of the SSAC in ensuring that competencies required by the industry are addressed in this Curriculum. I also thank all stakeholders in the Construction sector for their valuable input and all those who participated in the process of developing this Curriculum.

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

COUNCIL SECRETARY/CEO

TVET CDACC

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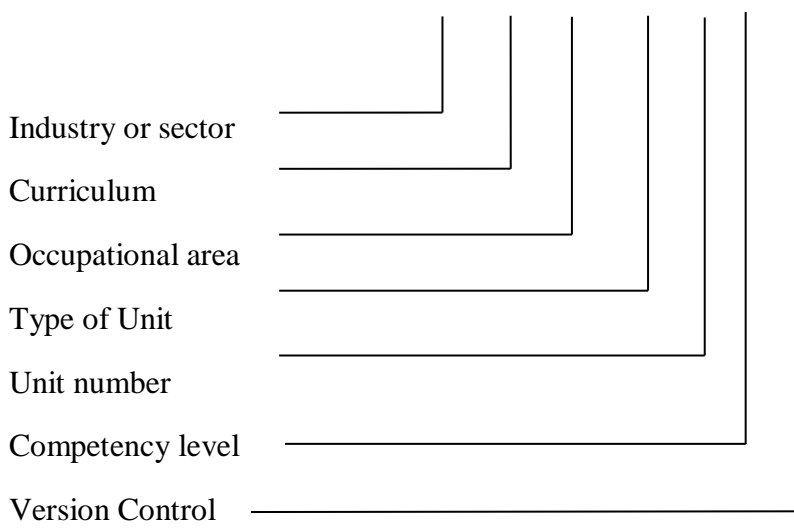
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ABBREVIATIONS AND ACRONYMS

ARC	: Architecture
BC	: Basic Competency
BIM	: Building information management systems
CC	: Common Competency
CDACC	: Curriculum Development, Assessment and Certification Council
CON	: Construction
CPU	: Central Processing Unit
CR	: Core Competency
CU	: Curriculum
EPS	: Expanded Polystyrene Systems
ICT	: Information Communication Technology
KCPE	: Kenya Certificate of Primary Education
KCSE	: Kenya Certificate of secondary Education
KNQA	: Kenya National Qualifications Authority
NCA	: National Construction Authority
NEMA	: National Environmental Management Authority
OSHA	: Occupation Safety and Health Act
OSHS	: Occupation Safety and Health Standards
PC	: Personal Computer
PPE	: Personal Protective Equipment
SOPs	: Standard Operating Procedures
SSAC	: Sector Skills Advisory Committee
TVET	: Technical and Vocational Education and Training

KEY TO UNIT CODE

CON/ CU/ ARC/ BC /01 /5/ A



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COURSE OVERVIEW

This course consists of competencies required by an architectural draftsman to carry out architectural studio, architectural perspectives, architectural modelling, and building finishes and fittings.

It consists of the following units of learning:

BASIC UNITS OF LEARNING

UNIT CODE	UNIT TITLE	DURATION IN HRS	CREDIT FACTORS
CON/CU/ARC/BC/01/5/A	Communication skills	25	2.5
CON/CU/ARC/BC/02/5/A	Numeracy	40	4.0
CON/CU/ARC/BC/03/5/A	Digital literacy	45	4.5
CON/CU/ARC/BC/04/5/A	Entrepreneurship	70	7.0
CON/CU/ARC/BC/05/5/A	Employability skills	50	5.0
CON/CU/ARC/BC/06/5/A	Environmental literacy	25	2.5
CON/CU/ARC/BC/07/5/A	Occupational safety and health practices	25	2.5
	TOTAL	280	28

COMMON UNITS OF LEARNING

UNIT CODE	UNIT TITLE	DURATION IN HRS	CREDIT FACTORS
CON/CU/ARC/CC/01/5/A	Applied mathematics	80	8
CON/CU/ARC/CC/02/5/A	Technical drawing	60	6
CON/CU/ARC/CC/03/5/A	Workshop technology practices	60	6
CON/CU/ARC/CC/04/5/A	Building technology	120	12
	TOTAL	320	32

CORE UNITS OF LEARNING

UNIT CODE	UNIT OF LEARNING	DURATION IN HRS	CREDIT FACTORS
CON/CU/ARC/CR/01/5/A	Architectural Projects	120	12
CON/CU/ARC/CR/02/5/A	Architectural perspectives	60	6
CON/CU/ARC/CR/03/5/A	Architectural models Production	100	10
CON/CU/ARC/CR/04/5/A	Building finishes and fittings	100	10
	Industrial attachment	360	36
	TOTAL	740	74
	GRAND TOTAL	1340	134

The total duration of the course is **1340** hours which include 360 hours of industrial attachment.

Entry Requirements

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

- a) Kenya Certificate of Secondary Education (KCSE) mean grade D Plain.

Or

- b) Equivalent qualifications in a related field as determined by Kenya National Qualifications Authority (KNQA)

Trainer qualification

A trainer for this course should have a higher qualification than the level of this course

Industrial attachment

An individual enrolled in this course will be required to undergo an attachment for a period of three months. An individual enrolled in one of the core units of learning will be required to undergo a one month's attachment.

Assessment

The course will be assessed at two levels: internally and externally. Internal assessment is continuous and is conducted by the trainer who is monitored by an accredited internal verifier while external assessment is the responsibility of TVET CDACC.

Certification

A candidate will be issued with a Certificate of Competency for each core unit of competency. To attain the qualification in Architectural Draftsmanship Level 5, the candidate must demonstrate competence in all the units of competency as given in qualification pack. These certificates will be issued by TVET CDACC in conjunction with training provider.

BASIC UNITS OF LEARNING

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COMMUNICATION SKILLS

UNIT CODE: CON/CU/ARC/BC/01/5/A

Relationship to Occupational Standards

This unit addresses the Unit of Competency: Demonstrate Communication Skills

Duration of Unit: 25 hours

Unit Description

This unit covers the competencies required to demonstrate communication skills. It involves meeting communication needs of clients and colleagues, contributing to the development of communication strategies, conducting workplace interviews, facilitating group discussions and representing the organisation.

Summary of Learning Outcomes

1. Meet communication needs of clients and colleagues
2. Contribute to the development of communication strategies
3. Conduct interviews
4. Facilitate group discussions
5. Represent the organization

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Meet communication needs of clients and colleagues	<ul style="list-style-type: none">• Communication process• Modes of communication• Medium of communication• Effective communication• Barriers to communication• Flow of communication• Sources of information• Organizational policies• Organization requirements for written and electronic communication methods• Report writing	<ul style="list-style-type: none">• Interview• Third party reports• Written texts

	<ul style="list-style-type: none"> • Effective questioning techniques (clarifying and probing) • Workplace etiquette • Ethical work practices in handling communication • Active listening • Feedback • Interpretation • Flexibility in communication 	
2. Contribute to the development of communication strategies	<ul style="list-style-type: none"> • Dynamics of groups • Styles of group leadership • Openness and flexibility in communication • Communication skills relevant to client groups 	<ul style="list-style-type: none"> • Written • Observation
3. Conduct interviews	<ul style="list-style-type: none"> • Types of interview • Establishing rapport • Facilitating resolution of issues • Developing action plans 	<ul style="list-style-type: none"> • Written • Observation
4. Facilitate group discussions	<ul style="list-style-type: none"> • Identification of communication needs • Dynamics of groups • Styles of group leadership • Presentation of information • Encouraging group members participation • Evaluating group communication strategies 	<ul style="list-style-type: none"> • Written • Observation
5. Represent the organization	<ul style="list-style-type: none"> • Presentation techniques • Development of a presentation • Multi-media utilization in presentation • Communication skills relevant to client groups 	<ul style="list-style-type: none"> • Observation • Written

Suggested Methods of Instruction

- Role playing
- Viewing of related videos

Recommended Resources

- Desktop computers/laptops
- Internet connection
- Projectors
- Telephone

NUMERACY SKILLS

UNIT CODE: CON/CU/ARC/BC/02/5/A

Relationship to Occupational Standards:

This unit addresses the Unit of Competency: Demonstrate Numeracy Skills

Duration of Unit: 40 hours

Unit Description

This unit covers the competencies required to demonstrate numeracy skills. It involves calculating with whole numbers and familiar fractions, decimals, and percentages for work estimating, measuring, and calculating with routine metric measurements for work, using routine maps and plans for work, interpreting, drawing and constructing 2D and 3D shapes for work, interpreting routine tables, graphs and charts for work, collecting data and constructing routine tables and graphs for work and using basic functions of calculator

Summary of Learning Outcomes

1. Calculate with whole numbers and familiar fractions, decimals and percentages for work
2. Estimate, measure and calculate with routine metric measurements for work
3. Use routine maps and plans for work
4. Interpret, draw and construct 2D and 3D shapes for work
5. Interpret routine tables, graphs and charts for work
6. Collect data and construct routine tables and graphs for work
7. Use basic functions of calculator

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Calculate with whole numbers and familiar fractions, decimals and percentages for work	<ul style="list-style-type: none">• Interpretation of whole numbers, fractions, decimals, percentages and rates• Calculations involving several steps• Calculation with whole numbers and routine or familiar fractions, decimals and percentages	<ul style="list-style-type: none">• Written• Practical test• Observation

	<ul style="list-style-type: none"> • Conversion between equivalent forms of fractions, decimals and percentages • Application of order of operations to solve multi-step calculations • Application of problem solving strategies • Making estimations to check reasonableness of problem solving process, outcome and its appropriateness to the context and task • Use of formal and informal mathematical language and symbolism to communicate the result of a task 	
2. Estimate, measure and calculate with routine metric measurements for work	<ul style="list-style-type: none"> • Selection and interpretation of measurement information in workplace tasks and texts • Identification and selection of routine measuring equipment • Estimation and making measurements using correct units • Estimation and calculation using routine measurements • Performing conversions between routinely used metric units • Using problem solving processes to undertake tasks • Recording information using mathematical language and symbols 	<ul style="list-style-type: none"> • Written • Practical test • Observation
3. Use routine maps and plans for work	<ul style="list-style-type: none"> • Identification of features in routine maps and plans • Symbols and keys used in routine maps and plans 	<ul style="list-style-type: none"> • Written • Practical test • Observation

	<ul style="list-style-type: none"> • Identification and interpretation of orientation of map to North • Demonstrate understanding of direction and location • Apply simple scale to estimate length of objects, or distance to location or object • Give and receive directions using both formal and informal language 	
<p>4. Interpret, draw and construct 2D and 3D shapes for work</p>	<ul style="list-style-type: none"> • Identify two dimensional shapes and routine three-dimensional shapes in everyday objects and in different orientations • Explain the use and application of shapes • Use formal and informal mathematical language and symbols to describe and compare the features of two-dimensional shapes and routine three-dimensional shapes • Identify common angles • Estimate common angles in everyday objects • Use formal and informal mathematical language to describe and compare common angles • Use common geometric instruments to draw two dimensional shapes • Construct routine three-dimensional objects from given nets 	<ul style="list-style-type: none"> • Written • Practical test • Observation

<p>5. Interpret routine tables, graphs and charts for work</p>	<ul style="list-style-type: none"> • Identify routine tables, graphs and charts in predominately familiar texts and contexts • Identify common types of graphs and their different uses • Identify features of tables, graphs and charts • Locate specific information • Perform calculations to interpret information • Explain how statistics can inform and persuade • Identify misleading statistical information • Discuss information relevant to the workplace 	<ul style="list-style-type: none"> • Oral • Written • Practical test • Observation
<p>6. Collect data and construct routine tables and graphs for work</p>	<ul style="list-style-type: none"> • Identify features of common tables and graphs • Identify uses of different tables and graphs • Determine data and variables to be collected • Determine audience • Select a method to collect data • Collect data • Collate information in a table • Determine suitable scale and axes • Draft and draw graph to present information • Check that data meets the expected results and context • Report or discuss information using formal and informal mathematical language 	<ul style="list-style-type: none"> • Written • Practical test • Observation

<p>7. Use basic functions of calculator</p>	<ul style="list-style-type: none"> • Identify and use keys for basic functions on a calculator • Calculate using whole numbers, money and routine decimals and percentages • Calculate with routine fractions and percentages • Apply order of operations to solve multi-step calculations • Interpret display and record result • Make estimations to check reasonableness of problem solving process, outcome and its appropriateness to the context and task • Use formal and informal mathematical language and appropriate symbolism and conventions to communicate the result of the task 	<ul style="list-style-type: none"> • Written • Practical test • Observation
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Suggested Methods of Instruction

- Demonstrations
- Role playing
- Viewing of related videos
- Discussion
- Assignments

Recommended resources

- Calculators
- Basic measuring instruments

DIGITAL LITERACY

UNIT CODE: CON/CU/ARC/BC/03/5/A

Relationship to Occupational Standards

This unit addresses the Unit of Competency: Demonstrate Digital Literacy

Duration of Unit: 45 hours

Unit Description

This unit covers the competencies required to demonstrate digital literacy. It involves identifying appropriate computer software and hardware, applying security measures to data, hardware, software in automated environment, applying computer software in solving tasks, applying internet and email in communication at workplace, applying desktop publishing in official assignment and preparing presentation packages.

Summary of Learning Outcomes

1. Identify computer software and hardware
2. Apply security measures to data, hardware, software in automated environment
3. Apply computer software in solving tasks
4. Apply internet and email in communication at workplace
5. Apply desktop publishing in official assignments
6. Prepare presentation packages

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Identify computer hardware and software	<ul style="list-style-type: none">• Concepts of ICT• Functions of ICT• History of computers• Components of a computer• Classification of computers	<ul style="list-style-type: none">• Written tests• Oral presentation• Observation
2. Apply security measures to data, hardware and software	<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	<ul style="list-style-type: none">• Written tests• Oral presentation• Observation• Project

	<ul style="list-style-type: none"> • Laws governing protection of ICT 	
3. Apply computer software in solving tasks	<ul style="list-style-type: none"> • Operating system • Word processing • Spread sheets • Data base design and manipulation • Data manipulation, storage and retrieval 	<ul style="list-style-type: none"> • Oral questioning • Observation • Project
4. Apply internet and email in communication at workplace	<ul style="list-style-type: none"> • Computer networks • Network configurations • Uses of internet • Electronic mail (e-mail) concept 	<ul style="list-style-type: none"> • Oral questioning • Observation • Oral presentation • Written report
5. Apply desktop publishing in official assignments	<ul style="list-style-type: none"> • Concept of desktop publishing • Opening publication window • Identifying different tools and tool bars • Determining page layout • Opening, saving and closing files • Drawing various shapes using DTP • Using colour pellets to enhance a document • Inserting text frames • Importing and exporting text • Object linking and embedding • Designing of various publications • Printing of various publications 	<ul style="list-style-type: none"> • Oral questioning • Observation • Oral presentation • Written report • Project
6. Prepare presentation packages	<ul style="list-style-type: none"> • Types of presentation packages • Procedure of creating slides • Formatting slides • Presentation of slides • Procedure for editing objects 	<ul style="list-style-type: none"> • Oral questioning • Observation • Oral presentation • Written report • Project

Suggested Methods of Instruction

- Demonstration
- Viewing of related videos

- Discussions
- Assignments
- Direct instructions

Recommended Resources

- Computers
- Other digital devices
- Printers
- Storage devices
- Internet access
- Computer software

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ENTREPRENEURIAL SKILLS

UNIT CODE: CON/CU/ARC/BC/04/5/A

Relationship to Occupational Standards

This unit addresses the Unit of Competency: Demonstrate Entrepreneurship

Duration of unit: 70 hours

Unit Description

This unit covers the competencies required to demonstrate understanding of entrepreneurship. It involves demonstrating understanding of an entrepreneur, entrepreneurship and self-employment. It also involves identifying entrepreneurship opportunities, creating entrepreneurial awareness, applying entrepreneurial motivation and developing business innovative strategies.

Summary of Learning Outcomes

1. Demonstrate understanding of an entrepreneur
2. Demonstrate knowledge of entrepreneurship and self-employment
3. Identify entrepreneurship opportunities
4. Create entrepreneurial awareness
5. Apply entrepreneurial motivation
6. Develop innovative business strategies
7. Develop Business plan

Learning Outcome	Content	Suggested Assessment Methods
1. Demonstrate knowledge of entrepreneurship and self-employment	<ul style="list-style-type: none">• Importance of self-employment• Requirements for entry into self-employment• Role of an Entrepreneur in business• Contributions of Entrepreneurs to National development	<ul style="list-style-type: none">• Individual/group assignments• Projects• Written tests• Oral questions• Third party

<p>2. Identify entrepreneurship opportunities</p>	<ul style="list-style-type: none"> • Business ideas and opportunities • Sources of business ideas • Business life cycle • Legal aspects of business • Assessment of product demand • Business environment • Factors to consider when evaluating business environment 	<ul style="list-style-type: none"> • Individual/group assignments • Projects • Written tests • Oral questions • Third party report • Interviews
<p>3. Create entrepreneurial awareness</p>	<ul style="list-style-type: none"> • Forms of businesses • Sources of business finance • Factors in selecting source of business finance • Governing policies on Small Scale Enterprises (SSEs) • Problems of starting and operating SSEs 	<ul style="list-style-type: none"> • Individual/group assignments • Projects • Written tests • Oral questions • Third party report • Interviews
<p>4. Apply entrepreneurial motivation</p>	<ul style="list-style-type: none"> • Internal and external motivation • Motivational theories • Self-assessment • Entrepreneurial orientation • Effective communications in entrepreneurship • Principles of communication • Entrepreneurial motivation 	<ul style="list-style-type: none"> • Case studies • Individual/group assignments • Projects • Written tests • Oral questions • Third party report • Interviews
<p>5. Develop business innovative strategies</p>	<ul style="list-style-type: none"> • Innovation in business • Small business Strategic Plan • Creativity in business development • Linkages with other entrepreneurs • ICT in business growth and development 	<ul style="list-style-type: none"> • Case studies • Individual/group assignments • Projects • Written tests • Oral questions • Third party report • Interviews

6. Develop Business Plan	<ul style="list-style-type: none"> • Business description • Marketing plan • Organizational/Management plan • Production/operation plan • Financial plan • Executive summary • Presentation of Business Plan 	<ul style="list-style-type: none"> • Case studies • Individual/group assignments • Projects • Written tests • Oral questions • Third party report • Interviews
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Suggested Methods of Instruction

- Direct instruction
- Project
- Case studies
- Field trips
- Discussions
- Demonstration
- Question and answer
- Problem solving
- Experiential
- Team training

Recommended Resources

- Case studies
- Business plan templates
- Computers
- Overhead projectors
- Internet
- Mobile phone
- Video clips
- Films
- Newspapers and Handouts
- Business Journals
- Writing materials

EMPLOYABILITY SKILLS

UNIT CODE: CON/CU/ARC/BC/05/5/A

Relationship to Occupational Standards

This unit addresses the Unit of Competency: Demonstrate Employability Skills

Duration of Unit: 50 hours

Unit Description

This unit covers competencies required to demonstrate 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 workplace ethics.

Summary of Learning Outcomes

1. Conduct self-management
2. Demonstrate interpersonal communication
3. Demonstrate critical safe work habits
4. Lead small teams
5. Plan and organize work
6. Maintain professional growth and development
7. Demonstrate workplace learning
8. Demonstrate problem solving skills
9. Demonstrate workplace ethics

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• Emotional intelligence• Assertiveness versus aggressiveness• Expressing personal thoughts, feelings and beliefs	<ul style="list-style-type: none">• Written tests• Oral questioning• Interviewing• Portfolio of evidence• Third party report

	<ul style="list-style-type: none"> • Developing and maintaining high self-esteem • Developing and maintaining positive self-image • Articulating ideas and aspirations • Accountability and responsibility • Good work habits • Self-awareness • Self-development • Financial literacy • Healthy lifestyle practices 	
2. Demonstrate interpersonal communication	<ul style="list-style-type: none"> • Meaning of interpersonal communication • Listening skills • Types of audience • Writing skills • Reading skills • Meaning of empathy • Understanding customers' needs • Establishing communication networks • Sharing information 	<ul style="list-style-type: none"> • Written tests • Oral questioning • Interviewing • Portfolio of evidence • Third party report
3. Demonstrate critical safe work habits	<ul style="list-style-type: none"> • Stress and stress management • Punctuality and time consciousness • Leisure • Integrating personal objectives into organizational objectives • Resources utilization • Setting work priorities • HIV and AIDS • Drug and substance abuse • Handling emerging issues 	<ul style="list-style-type: none"> • Written tests • Oral questioning • Interviewing • Portfolio of evidence • Third party report
4. Lead a small team	<ul style="list-style-type: none"> • Leadership qualities • Team building • Determination of team roles and objectives • Team performance indicators • Responsibilities in a team 	<ul style="list-style-type: none"> • Written tests • Oral questioning • Interviewing • Portfolio of evidence • Third party report

	<ul style="list-style-type: none"> • Forms of communication • Complementing team activities • Gender and gender mainstreaming • Human rights • Maintaining relationships • Conflicts and conflict resolution 	
5. Plan and organize work	<ul style="list-style-type: none"> • Functions of management <ul style="list-style-type: none"> ✓ Planning ✓ Organizing • Time management • Decision making process • Task allocation • Evaluating work activities • Resource utilization • Problem solving • Collecting and organising information 	<ul style="list-style-type: none"> • Written tests • Oral questioning • Interviewing • Portfolio of evidence • Third party report
6. Maintain professional growth and development	<ul style="list-style-type: none"> • Opportunities for professional growth • Assessing training needs • Licenses and certifications for professional growth and development • Pursuing personal and organizational goals • Identifying work priorities • Recognizing career advancement 	<ul style="list-style-type: none"> • Written tests • Oral questioning • Interviewing • Portfolio of evidence • Third party report
7. Demonstrate workplace learning	<ul style="list-style-type: none"> • Managing own learning • Contributing to the learning community at the workplace • Cultural aspects of work • Variety of learning context • Application of learning • Safe use of technology • Identifying opportunities • Generating new ideas • Workplace innovation • Performance improvement 	<ul style="list-style-type: none"> • Written tests • Oral questioning • Interviewing • Portfolio of evidence • Third party report

	<ul style="list-style-type: none"> • Handling emerging issues • Future trends and concerns in learning 	
8. Demonstrate problem solving skills	<ul style="list-style-type: none"> • Problem identification • Problem solving • Application of problem-solving strategies • Resolving customer concerns 	<ul style="list-style-type: none"> • Written tests • Oral questioning • Interviewing • Portfolio of evidence • Third party report
9. Demonstrate workplace ethics	<ul style="list-style-type: none"> • Meaning of ethics • Ethical perspectives • Principles of ethics • Values and beliefs • Ethical standards • Organization code of ethics • 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 	<ul style="list-style-type: none"> • Written tests • Oral questioning • Interviewing • Portfolio of evidence • Third party report

Suggested Methods of Instruction

- Demonstrations
- Simulation/Role play
- Discussion
- Presentations
- Case studies
- Q&A

Recommended Resources

- Computers
- Stationery
- Charts
- Video clips
- Audio tapes
- Radio sets
- TV sets
- LCD projectors

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ENVIRONMENTAL LITERACY

UNIT CODE: CON/CU/ARC/BC/06/5/A

Relationship to Occupational Standards

This unit addresses the Unit of Competency: Demonstrate Environmental Literacy

Duration of Unit: 25 hours

Unit Description

This unit describes the competencies required to demonstrate understanding of environmental literacy. It involves controlling environmental hazard, controlling control environmental pollution, complying with workplace sustainable resource use, evaluating current practices in relation to resource usage, identifying environmental legislations/conventions for environmental concerns, implementing specific environmental programs and monitoring activities on environmental protection/programs.

Summary of Learning Outcomes

1. Control environmental hazards
2. Control environmental Pollution
3. Demonstrate sustainable use of resource
4. Evaluate current practices in relation to resource usage
5. Identify Environmental legislations/conventions for environmental concerns
6. Implement specific environmental programs
7. Monitor activities on Environmental protection/Programs

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Control environmental hazards	<ul style="list-style-type: none">• Purposes and content of Environmental Management and Coordination Act 1999• Purposes and content of Solid Waste Act• Storage methods for environmentally hazardous materials• Disposal methods of hazardous wastes• Types and uses of PPE in line with environmental regulations	<ul style="list-style-type: none">• Written test• Oral questions• Observation

	<ul style="list-style-type: none"> • Occupational Safety and Health Standards (OSHS) 	
2. Control environmental Pollution control	<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 pollution • Methods for minimizing noise pollution 	<ul style="list-style-type: none"> • Written test • Oral questions • Observation
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 test • Oral questions • Observation
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, • Measurement and recording of current resource usage • 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 test • Oral questions • Observation
5. Identify Environmental legislations/conventions for environmental concerns	<ul style="list-style-type: none"> • Environmental issues/concerns • Environmental legislations /conventions and local ordinances • Industrial standard /environmental practices • International Environmental Protocols (Montreal, Kyoto) • Features of an environmental strategy 	<ul style="list-style-type: none"> • Written questions • Oral questions • Observation

<p>6. Implement specific environmental programs</p>	<ul style="list-style-type: none"> • Community needs and expectations • Resource availability • 5 s 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
<p>7. Monitor activities on Environmental protection/Programs</p>	<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

Suggested Methods of Instruction

- Instructor led facilitation of theory
- Demonstration by trainer
- Viewing of related videos
- Project
- Assignments
- Role play

Recommended Resources

- Standard operating and/or other workplace procedures manuals
- Specific job procedures manuals
- Environmental Management and Coordination Act 1999
- Machine/equipment manufacturer’s specifications and instructions
- Personal Protective Equipment (PPE)
- ISO standards
- Company environmental management systems (EMS)
- Montreal Protocol

- Kyoto Protocol

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OCCUPATIONAL SAFETY AND HEALTH PRACTICES

UNIT CODE: CON/CU/ARC/BC/07/5/A

Relationship to Occupational Standards

This unit addresses the Unit of Competency: Demonstrate Occupational Safety and Health Practices

Duration of Unit: 25 hours

Unit Description

This unit specifies the competencies required to identify workplace hazards and risk, identify and implement appropriate control measures and implement OSH programs, procedures and policies/ guidelines

Summary of Learning Outcomes

1. Identify workplace hazards and risk
2. Control OSH hazards
3. Implement OSH programs

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 is conducted by• Authorized personnel or agency• Gathering of OHS issues and/or concerns raised	<ul style="list-style-type: none">• Oral questions• Written tests• Portfolio of evidence• Third party report
2. Control OSH hazards	<ul style="list-style-type: none">• Prevention and control measures, including use of PPE (personal protective equipment) for specific hazards are identified and implemented	<ul style="list-style-type: none">• Oral questions• Written tests• Portfolio of evidence• Third party report

		<ul style="list-style-type: none"> • Appropriate risk controls based on result of OSH hazard evaluation is recommended • Contingency measures, including emergency procedures during workplace incidents and emergencies are recognized and established in accordance with organization procedures 	
3. Implement programs	OSH	<ul style="list-style-type: none"> • Providing information to work team about company OHS program, procedures and policies/guidelines • Participating in 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"> • Oral questions • Written tests • Portfolio of evidence • Third party report

Suggested Methods of Instruction

- Assignments
- Discussion
- Q&A
- Role play
- Viewing of related videos

Recommended Resources

- Standard operating and/or other workplace procedures manuals
- Specific job procedures manuals
- Machine/equipment manufacturer's specifications and instructions
- Personal Protective Equipment (PPE) e.g.
 - Mask
 - Face mask/shield

- Safety boots
- Safety harness
- Arm/Hand guard, gloves
- Eye protection (goggles, shield)
- Hearing protection (ear muffs, ear plugs)
- Hair Net/cap/bonnet
- Hard hat
- Face protection (mask, shield)
- Apron/Gown/coverall/jump suit
- Anti-static suits
- High-visibility reflective vest

COMMON UNITS OF LEARNING

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APPLIED MATHEMATICS

UNIT CODE: CON/CU/ARC/CC/01/5/A

Relationship to Occupational Standards

This unit addresses the unit of competency: Apply mathematical skills

Duration of Unit: 80 hours

Unit Description

This unit describes the competencies required by a technician in order to apply a wide range of mathematical skills in their work; apply ratios and proportions to solve problems; use algebraic and graphical techniques to analyse mathematical problems; apply concepts of probability; perform commercial calculations and collect, organise and analyse statistical data.

Summary of Learning Outcomes

1. Apply Algebra
2. Apply Trigonometry and hyperbolic functions
3. Apply Coordinate Geometry
4. Carry out Mensuration
5. Apply Statistics
6. 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	<ul style="list-style-type: none">• Written tests• Oral questioning• Assignments• Supervised exercises

	<ul style="list-style-type: none"> Solutions of problems involving AP and GP 	
2. Apply Trigonometry	<ul style="list-style-type: none"> Half -angle formula Factor formula Trigonometric functions Parametric equations Relative and absolute measures Measures calculations 	<ul style="list-style-type: none"> Written tests Oral questioning Assignments Supervised exercises
3. Apply Coordinate Geometry	<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"> Assignments Oral questioning Practical tests Observation Supervised exercises Written tests
4. Carry out Mensuration	<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 <ul style="list-style-type: none"> Areas and volumes using Pappus theorem 	<ul style="list-style-type: none"> Assignments Supervised exercises Written tests
5. Apply Statistics	<ul style="list-style-type: none"> Classification of data <ul style="list-style-type: none"> Grouped data Ungrouped data Data collection Tabulation of data <ul style="list-style-type: none"> Class intervals Class boundaries Frequency tables Diagrammatic and graphical presentation of data e.g. 	<ul style="list-style-type: none"> Oral questioning Written tests Assignments Supervised exercises

	<ul style="list-style-type: none"> • Histograms • Frequency polygons • Bar charts • Pie charts • Cumulative frequency curves • Measures of central tendency mean, mode and median • Measures of dispersion <ul style="list-style-type: none"> • Variance and standard deviation • Definition of probability • Laws of probability • Expectation variance and S.D. • Types of distributions • Mean, variance and SD of probability distributions 	
6. 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 unknowns • Application of matrices 	<ul style="list-style-type: none"> • Assignments • Oral questioning • Supervised exercises • Written tests

Suggested Methods of Instruction

- Group discussions
- Demonstration by trainer
- Exercises by trainee

Recommended Resources

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

TECHNICAL DRAWING

UNIT CODE: CON/CU/ARC/CC/02/5/A

Relationship to Occupational Standards

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

Duration of Unit: 60 hours

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. Use and maintain drawing equipment and materials
2. Produce plane geometry drawings
3. Produce solid geometry drawings
4. Produce orthographic and pictorial drawings of components
5. 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 questioning• Written tests

2. Produce plane geometry drawings	<ul style="list-style-type: none"> • Types of lines in drawings • Construction of geometric forms e.g. squares, circles • Construction of different angles • Measurement of different angles • Bisection of different angles and lines • Standard drawing conventions • Ellipses • Tangents and circles • Polygons • Loci 	<ul style="list-style-type: none"> • Oral questioning • Practical tests • 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 • Practical tests • Oral questioning
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 • Practical tests • Oral questioning
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 questioning • Practical tests
6. Apply CAD packages	<ul style="list-style-type: none"> • Identification of CAD packages e.g. AutoCAD, circuit maker 	<ul style="list-style-type: none"> • Observation • Oral questioning • Practical tests

	<ul style="list-style-type: none">• Use of CAD packages in drawing of:<ul style="list-style-type: none">• Plane geometry• Solid• Orthographic• Pictorial	
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Suggested Methods of Instruction

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

Recommended Resources

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

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WORKSHOP TECHNOLOGY

UNIT CODE: CON/CU/ARC/CC/03/5/A

Relationship to Occupational Standards

This unit addresses the unit of competency: Apply Workshop Technology Practices

Duration of Unit: 60 Hours

Unit Description

This unit describes the competence in applying workshop technology practices. It entails performing masonry, plumbing and carpentry tasks.

Summary of Learning Outcomes

1. Perform masonry tasks
2. Perform plumbing tasks
3. Perform carpentry tasks

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Perform masonry tasks	<ul style="list-style-type: none">• Masonry workshop safety requirements• Masonry hand tools• Masonry machine tools• Maintenance of masonry tools• Use of masonry tools	<ul style="list-style-type: none">• Written tests• Oral Questioning• Practical tests• Project
2. Perform plumbing tasks	<ul style="list-style-type: none">• Plumbing workshop safety requirements• Plumbing hand tools• Plumbing machine tools• Maintenance of Plumbing tools• Use of Plumbing tools	<ul style="list-style-type: none">• Written tests• Oral Questioning• Practical tests• Project
3. Perform carpentry tasks	<ul style="list-style-type: none">• Carpentry workshop safety requirements• Carpentry hand tools• Carpentry machine tools• Maintenance of Carpentry tools• Use of Carpentry tools	<ul style="list-style-type: none">• Written tests• Oral Questioning• Practical tests• Project

Suggested Methods of Instruction

- Demonstration by trainer
- Practical work by trainee
- Demonstration videos
- Field trips
- Trainee group discussions

Recommended Resources

Tools and equipment

- Masons trowel
- Wood float
- Cold chisels
- Masons square
- Spade
- Shovel
- Plumb bob
- Concrete mixer
- Block cutter
- Vibrator
- Pneumatic hammer
- Compactors
- Bench shears
- Anvil
- Pipe wrench
- Pliers
- Bending machine
- Welding
- Sheet metal holding machine
- Portable power drill
- Saws
- Planes
- Hammer
- Carpenter square
- Marking gauges
- Hand drill
- Screw drivers
- circular saw
- Thicknesser

- Portable sander
- Close cut saw
- Portable drill machine
- screw driver
- pliers
- long nose
- side cutter
- draw in wire
- Leather gloves
- Chipping hammers
- Welding goggles
- Tongs
- Hand vices
- Mole punch
- Pliers

Materials and supplies

- Lumber
- PPR pipes
- PVC pipes
- GI pipes
- Pipe fittings
- Cement
- Sand
- Lime
- Sheet metal
- Steel plates
- Plumbing appliances
- Fuel
- Grease
- Oil
- Filters

Personal protective equipment (PPEs)

- Helmets
- Gloves
- Safety goggles
- Safety boots
- Overalls
- Dust masks and gas masks

- Dust coats

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BUILDING TECHNOLOGY

UNIT CODE: CON/CU/ARC/CC/04/5/A

Relationship to Occupational Standards

This unit addresses the unit of competency: Apply principles of building technology

Duration of Unit: 120 hours

Unit Description

This unit describes the competencies required to conduct site investigations, identify building elements, draw substructure, draw superstructure, prepare reinforced concrete, apply building finishes and fittings, draw architectural landscape and apply alternative building technologies.

Summary of Learning Outcomes

1. Conduct site investigations
2. Identify building elements
3. Draw substructure
4. Draw superstructure
5. Prepare reinforced concrete
6. Apply building finishes and fittings
7. Draw architectural landscape
8. Apply alternative building technologies

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Conduct site investigations	<ul style="list-style-type: none">• Significance of site investigation• Site investigation elements/areas<ul style="list-style-type: none">• Site boundaries• Soil• Existing structures/services• Labour and construction materials• Site investigation procedure• Interpretation of contour maps• Survey equipment and tools• Occupational health and safety precautions	<ul style="list-style-type: none">• Observation• Oral questioning• Written tests• Projects• practical Tests

	<ul style="list-style-type: none"> • Hoarding erection • Site clearance <ul style="list-style-type: none"> • Methods of site clearance • Tools and equipment used in site clearance • Safety issues in site clearance • Setting out of building • Excavation procedures 	
2. Identify building elements	<ul style="list-style-type: none"> • Production of precast concrete • Timber components • Metal components • Stabilized soil components 	<ul style="list-style-type: none"> • Observation • Oral questioning • Written tests • Projects • practical Tests
3. Draw substructure	<ul style="list-style-type: none"> • Methods used in levelling <ul style="list-style-type: none"> • Cut • Fill • Cut and fill • Profile boards • Types of profile boards <ul style="list-style-type: none"> • Corner profile boards • Single profile boards • Use of profile boards • Foundations <ul style="list-style-type: none"> • Types of foundations • Materials used in construction of foundations • Hard core <ul style="list-style-type: none"> • Functions of hard core • Materials used • Characteristics of hard core material • Blinding <ul style="list-style-type: none"> • Functions of blinding • Materials used • Characteristics of blinding materials • Anti-termite treatment 	<ul style="list-style-type: none"> • Observation • Oral questioning • Written tests • Projects • Practical tests

	<ul style="list-style-type: none"> • Significance of anti-termite treatment • Chemicals used for anti-termite treatment • Safety precautions in chemical handling • Damp proofing <ul style="list-style-type: none"> • Significance of damp proofing • Materials used in damp proofing • Characteristics of damp proofing materials • Concrete bed construction <ul style="list-style-type: none"> • Mass concrete • Reinforced concrete 	
<p>4. Draw superstructure</p>	<ul style="list-style-type: none"> • Setting out superstructure works • Superstructure concrete works <ul style="list-style-type: none"> • Concrete in columns • Concrete in suspended slabs and beams • Formwork • Reinforcement • Curing of concrete • Superstructure walling <ul style="list-style-type: none"> • Forms of wall construction • Types of walls • Materials used in wall construction • Tools and equipment used in wall construction • Damp proofing in walls • Roof construction <ul style="list-style-type: none"> • Functional requirements of roofs • Materials used in roof construction • Types of roofs • Parts of a roof 	<ul style="list-style-type: none"> • Observation • Oral questioning • Written tests • Projects • practical Tests

	<ul style="list-style-type: none"> • Roof construction procedure • Roof cover <ul style="list-style-type: none"> • Types of roof cover materials <ul style="list-style-type: none"> ▪ Traditional roof cover ▪ Modern roof cover • Functional requirements of roof covers • Roof underlays • Roof cover laying procedure <ul style="list-style-type: none"> ▪ Tiles ▪ Concrete ▪ Sheets • Rain water goods installation <ul style="list-style-type: none"> • Gutter • Downpipes • Channels 	
5. Prepare reinforced concrete	<ul style="list-style-type: none"> • Preparation of Formwork • Steel fixing • Concreting procedures 	<ul style="list-style-type: none"> • Observation • Oral questioning • Written tests • Practical Tests
6. Apply building finishes and fittings	<ul style="list-style-type: none"> • Types of building finishes • Types of building fittings • Methods of finishes application 	<ul style="list-style-type: none"> • Observation • Oral questioning • Written tests • Projects • practical Tests
7. Draw architectural landscape	<ul style="list-style-type: none"> • Ground preparations • Setting out of pathways and driveways • Plants and vegetation establishment • Laying of pathways and driveways 	<ul style="list-style-type: none"> • Observation • Oral questioning • Written tests • Projects • practical Tests
8. Apply alternative building technology	<ul style="list-style-type: none"> • Types of alternative building technologies <ul style="list-style-type: none"> • EPS (expanded polystyrene systems) • Interlocking blocks 	<ul style="list-style-type: none"> • Observation • Oral questioning • Written tests • Projects • practical Tests

	<ul style="list-style-type: none"> • Prefabricated wall panels • Metal panels • Timber panels • Plastics • Glass panels • Traditional construction materials. 	
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Suggested Methods of Instruction

- Demonstration by trainer
- Practical work by trainee
- Demonstration videos
- Projects
- Group discussions

Recommended Resources

Tools and equipment

- Excavating tools and equipment
- Profile boards
- Wheelbarrows
- Trowels
- Spirit levels
- Mason squares
- Steel floats
- Motor boards
- Plumb bob
- Steel bending and fixing tools/machines
- Concrete mixers
- Spades
- Sprayer
- Painting brushes
- Levelling equipment

Materials and supplies

- Cement
- Water
- Sand
- Ballast

- Reinforcement bars
- Paint
- Tiles
- Terrazzo
- Sheets
- Timber
- Steel
- Damp proofing materials
- Stones
- Bricks
- Murram
- Manufactured boards
- Glass
- Plastic

Personal protective equipment (PPEs)

- Dust coat
- Overall
- Helmet
- Safety boots
- Gloves
- First aid kit
- Goggles
- Dust masks

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CORE UNITS OF LEARNING

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ARCHITECTURAL PROJECTS

UNIT CODE: CON/CU/ARC/CR/01/5/A

Relationship to Occupational Standards

This unit addresses the unit of competency: Detail architectural projects

Duration of Unit: 120 hours

Unit Description

This unit describes the competencies required to conduct literature review, carry out case study, produce schematic drawings, prepare presentation drawings, prepare working drawings, prepare details drawings, revise working drawings and apply CADD in architectural work

Summary of Learning Outcomes

1. Conduct literature review
2. Carry out case study
3. Produce schematic drawings
4. Prepare presentation drawings
5. Prepare working drawings
6. Prepare details drawings
7. Revise working drawings
8. Apply CADD in architectural work

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Conduct literature review	<ul style="list-style-type: none">• Research• Evolution of construction materials• Historical backgrounds of projects	<ul style="list-style-type: none">• Reports• Sketches
2. Carry out case study	<ul style="list-style-type: none">• Meaning of case study• Importance of a case study• Local case studies• International case studies• SWOT Analysis of case studies	<ul style="list-style-type: none">• Observation• Oral questioning• Drawings and sketches

<p>3. Produce schematic drawings</p>	<ul style="list-style-type: none"> • Meaning of schematic drawings • Preparation of Bubble diagrams • Formulation of proportional sketches • Preparation of a sketch models • Viability of design 	<ul style="list-style-type: none"> • Observation • Oral questioning • Sketches/ drawings/ models • Practicals
<p>4. Prepare presentation drawings</p>	<ul style="list-style-type: none"> • Meaning of presentation drawings • Content of presentation drawings <ul style="list-style-type: none"> • Plans • Elevations • 3D models • Format of presentation drawings <ul style="list-style-type: none"> • Models • Drawings • Soft copy • Dimensioning • Artistic impressions 	<ul style="list-style-type: none"> • Observation • Oral questioning • Drawings and sketches • Practicals
<p>5. Prepare working drawings</p>	<ul style="list-style-type: none"> • Meaning and purpose of working drawings • Content of working drawings • Dimensions and labels • Preparation of door and window schedules • Indication of finishing materials and codes on the working drawing • Preparation of a detailed site plan • Local government regulations • Plotting drawing on a tracing paper • Production of drawing on blueprint • Preparation of bill of quantities • Preparation of a works program 	<ul style="list-style-type: none"> • Observation • Oral questioning • Drawings • Practicals
<p>6. Prepare details drawings</p>	<ul style="list-style-type: none"> • Integration of engineering drawings into the details drawings • Production of scaled details 	<ul style="list-style-type: none"> • Observation • Oral questioning • Drawings

	<ul style="list-style-type: none"> • Meaning and importance of details drawings • Format and content of details drawing • Detail drawings <ul style="list-style-type: none"> • Roofs • Walls • Floors 	<ul style="list-style-type: none"> • Practicals
7. Revise working drawings	<ul style="list-style-type: none"> • Meaning and importance of revising working drawings • Incorporation of additions and alterations in the working drawings • Presentation of revised working drawings • Local authorities • Occupational certificate 	<ul style="list-style-type: none"> • Observation • Oral questioning • Drawings • Practical Tests
8. Apply CADD in architectural work	<ul style="list-style-type: none"> • Production of architectural drawings using design software <ul style="list-style-type: none"> • Sketch • Presentation drawing • Working drawing • Detail drawing • Detail drawing plotting on a tracing paper • Detail drawing production on blueprint • Building information management (BIM) systems 	<ul style="list-style-type: none"> • Observation • Oral questioning • Projects • Practical Tests

Suggested Methods of Instruction

- Demonstration by trainer
- Practical work by trainee
- Demonstration videos
- Projects
- Group discussions
- Group projects

Recommended Resources

- Drawing paper
- Stationery
- Data
- Measuring tools
- Design software
- Computers
- Tracing paper
- Internet
- Transportation
- Cameras

ARCHITECTURAL PERSPECTIVES

UNIT CODE: CON/CU/ARC/CR/02/5/A

Relationship to Occupational Standards

This unit addresses the unit of competency: Produce architectural perspectives

Duration of Unit: 60 hours

Unit Description

This unit describes the competencies required to prepare freehand internal perspectives, prepare freehand external perspectives, produce pictorial views, and apply CAD in preparing perspectives and produce walkthrough videos

Summary of Learning Outcomes

1. Prepare freehand internal perspectives
2. Prepare freehand external perspectives
3. Produce pictorial views
4. Apply CAD in preparing perspectives
5. Produce walkthrough videos

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Prepare freehand internal perspectives	<ul style="list-style-type: none">• Internal Perspective drawing design• Detailing• Proportion and scale• Distance indication• Ariel perspective	<ul style="list-style-type: none">• Observation• Oral questioning• Pictorials
2. Prepare freehand external perspectives	<ul style="list-style-type: none">• External perspective drawing design• Proportion and scale• Distance indication• Ariel perspective	<ul style="list-style-type: none">• Observation• Oral questioning• Pictorials
3. Produce pictorial views	<ul style="list-style-type: none">• Axonometric views• Isometric views• Orthographic views• Perspectives	<ul style="list-style-type: none">• Observation• Oral questioning• Pictorials

	<ul style="list-style-type: none"> • Grid • Orthogonal geometry • Projections • Scales 	
4. Apply CAD in preparing perspectives	<ul style="list-style-type: none"> • Rendering software • Computer generated renderings • Presentation layouts 	<ul style="list-style-type: none"> • Observation • Oral questioning • Pictorials
5. Produce walkthrough videos	<ul style="list-style-type: none"> • Camera set up • Generation of walkthroughs <ul style="list-style-type: none"> • Interior walkthroughs • Exterior walkthroughs • Audios 	<ul style="list-style-type: none"> • Observation • Oral questioning • Videos

Suggested Methods of Instruction

- Demonstration by trainer
- Practical work by trainee
- Demonstration videos
- Projects
- Group discussions
- Group projects

Recommended Resources

- Rendering software
- Projectors
- Stationery
- Camera
- Drawing paper
- Computers
- Measuring tools
- Internet

ARCHITECTURAL MODELS PRODUCTION

UNIT CODE: CON/CU/ARC/CR/03/5/A

Relationship to Occupational Standards

This unit addresses the unit of competency: Produce architectural models

Duration of Unit: 100 hours

Unit Description

This unit describes the competencies required to produce schematic, digital and physical models

Summary of Learning Outcomes

1. Produce schematic/sketch models
2. Produce physical model
3. Produce digital models

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Produce schematic/sketch models	<ul style="list-style-type: none">• Rough sketches• Design formulation• Preparation of a schematic model	<ul style="list-style-type: none">• Observation• Oral questioning• Practical Tests
2. Produce physical model	<ul style="list-style-type: none">• Tools, materials and equipment• Scales• Construction of physical models<ul style="list-style-type: none">• Interior design• Building• Architectural landscaping• Detailed models<ul style="list-style-type: none">• Stair cases• Ramps• Windows• Doors• Roofs	<ul style="list-style-type: none">• Observation• Oral questioning• Practical Tests

3. Produce digital models	<ul style="list-style-type: none"> • Presentation drawings • Rendering/generating presentation drawings using CAD software 	<ul style="list-style-type: none"> • Observation • Oral questioning • Practical Tests
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Suggested Methods of Instruction

- Demonstration by trainer
- Practical work by trainee
- Demonstration videos
- Projects
- Group discussions

Recommended Resources

- Rendering software
- Computers
- Printing paper
- Measuring tools
- Modelling boards
- Wood
- Stationery
- Modelling stationery

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BUILDING FINISHES AND FITTINGS

UNIT CODE: CON/CU/ARC/CR/04/5/A

Relationship to Occupational Standards

This unit addresses the unit of competency: Install building finishes and fittings

Duration of Unit: 100 hours

Unit Description

This unit describes the competencies required to apply wall finishes, install doors, windows and openings, fix floor finishes, apply paint, and install furniture, fittings and ceilings

Summary of Learning Outcomes

1. Apply wall finishes
2. Install doors and windows
3. Fix floor and surface finishes
4. Apply paint
5. Install furniture and fittings
6. Install ceilings

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Apply wall finishes	<ul style="list-style-type: none">• Types of wall finishes• Application procedures of wall finishes	<ul style="list-style-type: none">• Observation• Oral questioning• Written tests/• Practical Tests
2. Install doors and windows	<ul style="list-style-type: none">• Preparation of opening schedules and design• Layout marking• Frames• First fixing<ul style="list-style-type: none">• Installation of doors /windows• Second fixing<ul style="list-style-type: none">• Door and window accessories	<ul style="list-style-type: none">• Observation• Oral questioning• Written tests• Projects• Practical Tests

3. Fix floor and surface finishes	<ul style="list-style-type: none"> • Types of floor finishes • Preparation of floor surfaces • Installation of floor finishes 	<ul style="list-style-type: none"> • Observation • Oral questioning • Practical Tests
4. Apply paint	<ul style="list-style-type: none"> • Types of paints • Preparation of Base surfaces • Preparation of Paint mix and varnish • Paint application procedures • Common painting defects • Maintenance of paint 	<ul style="list-style-type: none"> • Observation • Oral questioning • Practical Tests • Projects
5. Install furniture and fittings	<ul style="list-style-type: none"> • Types of furniture • Types of fittings • Furniture layouts • Installation of Furniture • Installation of fittings 	<ul style="list-style-type: none"> • Observation • Oral questioning • Drawings and models
6. Install ceilings	<ul style="list-style-type: none"> • Types of ceiling materials • Types of ceiling designs • Ceiling installation procedures • Ceiling fixtures. 	<ul style="list-style-type: none"> • Observation • Oral questioning • Projects • Practical Tests

Suggested Methods of Instruction

- Demonstration by trainer
- Practical work by trainee
- Demonstration videos
- Projects
- Group discussions

Recommended Resources

- Levels
- Finishes and fittings
- Paint
- Measuring tools
- Protective gear (PPEs)