

**THE REPUBLIC OF KENYA**

**COMPETENCY BASED CURRICULUM**

**FOR**

**CARPENTRY AND JOINERY**

**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 of Kenya’s development blueprint 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.

**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) and Ministry of livestock 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.

This 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 Construction Sector Skills Advisory Committee (SSAC) members for their contribution to the development of this Curriculum.

I also thank all stakeholders in the carpentry and joinery 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 building and construction acquire competencies that will enable them to perform their work more efficiently.

**COUNCIL SECRETARY/CEO**

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**ABBREVIATIONS AND ACRONYMS**

|  |  |
| --- | --- |
| CDACC | Curriculum Development Assessment and Certification Council |
| PPE | Personal Protective Equipment |
| BS | British Standards |
| ICT | Information Computer Technology |
| CON | Construction |
| OS | Occupational Standards |
| CAJ | Carpentry and Joinery |
| BC | Basic Competency |
| CC | Common Competency |
| CR | Core Competency |
| TVET | Technical Vocational Education and Training |
| 2D | Two Dimension |
| 3D | Three Dimension |
| HIV | Human Immunodeficiency Virus |
| AIDS | Acquired Immune Deficiency Syndrome |
| IT | Information Technology |
| OSHS | Occupational Safety and Health Standards |
| EMCA | Environmental Management and Coordination Act |
| CU | Curriculum |
| KCSE | Kenya Certificate of Secondary Education |
| KNQA | Kenya National Qualification Authority |
| DTP | Desktop Publishing |
| SWOT | Strengths Weaknesses Opportunities Threats |
| PEST | Political Economic Social Technological |
| CAD | Computer Aided Drawing |

**KEY TO UNIT CODE**

**CON /CU/CAJ/BC/01/5/A**

Industry or sector

Curriculum

Occupational area

Type of competency

Competency number

Competency level

Version control

**OVERVIEW**

1. **Brief description of the course:**

The present Curriculum presents a coherent and significant set of competences to acquire in order to perform the occupation of a **Carpentry and Joinery** **Craftsperson Level 5.** The competency-based approach, used to design the Curriculum, is industry driven and has considered the training needs, the work situation, as well as the goals and the means to implement training units of competencies.

The units of competency, within the present Curriculum, include a statement, description and a set of expected outcomes and results at the end of the training of each unit. It also clearly mentioned the training contents, the methods of training delivery, the methods of assessment, a list of main materials/tools/equipment needed and a list of recommended resources for each of the units.

The description of elements, methods of delivery and assessment and the lists of materials/tools and equipment will have a direct influence on the choice of the theoretical and/or practical learning activities and their respective timing. The competences are the targets of training: the acquisition of each is required for certification.

The present Curriculum consists of 19 units of competencies divided in three main lots:

**Basic units of learning**:

(also known as employability skills or key skills) skills which are not specific to work in a specific occupation or industry, but are important for work, education and life generally, as per the list in the following table:

|  |  |  |  |
| --- | --- | --- | --- |
| **Unit Code** | **Unit Title** | **Duration in Hours** | **Credit Factor** |
| CON/CU/CAJ/BC/01/5/A | Communication Skills | 25 | 2.5 |
| CON/CU/CAJ/BC/02/5/A | Numeracy skills | 40 | 4.0 |
| CON/CU/CAJ/BC/03/5/A | Digital Literacy | 45 | 4.5 |
| CON/CU/CAJ/BC/04/5/A | Entrepreneurial Skills | 70 | 7.0 |
| CON/CU/CAJ/BC/05/5/A | Employability Skills | 50 | 5.0 |
| CON/CU/CAJ/BC/06/5/A | Environmental literacy | 25 | 2.5 |
| CON/CU/CAJ/BC/07/5/A | Occupational Safety and Health Practices | 25 | 2.5 |
| **Total Number Of Hours** | | **280** | **28.0** |

**Common Units of Learning**

|  |  |  |  |
| --- | --- | --- | --- |
| **Unit Code** | **Unit Title** | **Duration in Hours** | **Credit factor** |
| CON/CU/CAJ/CC/01/5/A | Basic Mathematics | 80 | 8.0 |
| CON/CU/CAJ/CC/02/5/A | Technical Drawing | 60 | 6.0 |
| CON/CU/CAJ/CC/03/5/A | Science | 80 | 8.0 |
| CON/CU/CAJ/CC/04/5/A | Temporary Works | 75 | 7.5 |
| CON/CU/CAJ/CC/05/5/A | Site and Workshop Management | 80 | 8.0 |
| **Total Number Of Hours** | | **375** | **37.5** |

**Core Competency Units**:

Describe the skills, knowledge and attitudes within a competency standard that an industry sector has agreed are essential to be achieved if a person is to be accepted as competent at a particular level. Core competency units are normally those central to work in a particular industry as per the list in the following table:

|  |  |  |  |
| --- | --- | --- | --- |
| **Unit Code** | **Unit Title** | **Duration in Hrs** | **Credit factor** |
| CON/CU/CAJ/CR/01/5/A | Doors and Door frames | 120 | 12.0 |
| CON/CU/CAJ/CR/02/5/A | Windows and Window frames | 100 | 10.0 |
| CON/CU/CAJ/CR/03/5/A | Furniture items | 100 | 10.0 |
| CON/CU/CAJ/CR/04/5/A | Roof structures | 120 | 12.0 |
| CON/CU/CAJ/CR/05/5/A | Joiners second fixing | 100 | 10.0 |
| CON/CU/CAJ/CR/06/5/A | Timber floors and prefabricated buildings | 100 | 10.0 |
| CON/CU/CAJ/CR/07/5/A | Construction of Timber stairs | 100 | 10.0 |
|  | Industrial Attachment | 360 | 36.0 |
| Total Number Of Hours | | **1100** | **110.0** |
| **GRAND TOTAL** | | **1755** | **175.5** |

1. **Entry Requirements**

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

1. Attained KCSE with a mean grade of D (PLAIN)

**Or**

1. Carpentry and Joinery Qualification Level 4

**Or**

1. Equivalent qualifications as determined by Kenya National Qualifications Authority (KNQA)
2. **Trainer qualification**

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

1. **Provision for Industrial attachment**

It is envisaged that the trainee will undergo an industrial attachment training and assessment with a recognised construction services provider as a prerequisite for completion of this training course.

1. **Attachment/Internship:**

Attachment (Internship) is an opportunity for a learner to integrate career related experience by participating in planned, supervised work. This Curriculum anticipates at least 360h of attachment as integral part of the training. In addition, the training comprises practical learning activities (estimated to be >60% of the time) which are meant to reinforce trainees’ smooth access to employment or self-employment.

1. **Assessment**

Assessment is the process of gathering and judging evidence in order to decide whether a person has attained a standard of performance. The course will be assessed at two levels:

* Internal assessment is continuous and is conducted by the trainer who is monitored by an internal accredited verifier
* External assessment is the responsibility of TVET CDACC

1. **Certification**

On successful completion of a unit of Competency, a trainee will be issued with a Certificate competency and on successful completion of all Units of Competency a trainee will be awarded a National Certificate for Carpentry and Joinery level 5 qualification. These certificates will be issued by TVET CDACC in conjunction with training provider

**BASIC UNITS OF LEARNING**

## COMMUNICATION SKILLS

**UNIT CODE:** CON/CU/CAJ/BC/01/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Demonstrate Communication Skills

**Duration of Unit:** 25hours

**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 | * 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 * Effective questioning techniques (clarifying and probing) * Workplace etiquette * Ethical work practices in handling communication * Active listening * Feedback * Interpretation * Flexibility in communication | * Interview * Third party reports * Written texts |
| 1. Contribute to the development of communication strategies | * Dynamics of groups * Styles of group leadership * Openness and flexibility in communication * Communication skills relevant to client groups | * Written Tests * Observation |
| 1. Conduct interviews | * Types of interview * Establishing rapport * Facilitating resolution of issues * Developing action plans | * Written Tests * Observation |
| 1. Facilitate group discussions | * Identification of communication needs * Dynamics of groups * Styles of group leadership * Presentation of information * Encouraging group members participation * Evaluating group communication strategies | * Written Tests * Observation |
| 1. Represent the organization | * Presentation techniques * Development of a presentation * Multi-media utilization in presentation * Communication skills relevant to client groups | * Observation * Written Tests |

**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/CAJ/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 | * 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 * 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 | * Written Tests * Practical test * Observation |
| 1. Estimate, measure and calculate with routine metric measurements for work | * 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 | * Written Tests * Practical test * Observation |
| 1. Use routine maps and plans for work | * Identification of features in routine maps and plans * Symbols and keys used in routine maps and plans * 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 | * Written Tests * Practical test * Observation |
| 1. Interpret, draw and construct 2D and 3D shapes for work | * 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 | • Written Tests  • Practical test  • Observation |
| 1. Interpret routine tables, graphs and charts for work | * 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 | * Oral Questioning * Written Tests * Practical test * Observation |
| 1. Collect data and construct routine tables and graphs for work | * 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 | * Written Tests * Practical test * Observation |
| 1. Use basic functions of calculator | * 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 | * Written Tests * Practical test * Observation |

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/CAJ/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 | * Concepts of ICT * Functions of ICT * History of computers * Components of a computer * Classification of computers | * Written tests * Oral Questioning presentation * Observation |
| 1. Apply security measures to data, hardware and software | * Data security and control * Security threats and control measures * Types of computer crimes * Detection and protection against computer crimes * Laws governing protection of ICT | * Written tests * Oral presentation * Observation * Project |
| 1. Apply computer software in solving tasks | * Operating system * Word processing * Spread sheets * Data base design and manipulation * Data manipulation, storage and retrieval | * Oral questioning * Observation * Project |
| 1. Apply internet and email in communication at workplace | * Computer networks * Network configurations * Uses of internet * Electronic mail (e-mail) concept | * Oral questioning * Observation * Oral presentation * Written report |
| 1. Apply desktop publishing in official assignments | * 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 | * Oral questioning * Observation * Oral presentation * Written report * Project |
| 1. Prepare presentation packages | * Types of presentation packages * Procedure of creating slides * Formatting slides * Presentation of slides * Procedure for editing objects | * 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

## ENTREPRENEURIAL SKILLS

**UNIT CODE:** CON/CU/CAJ/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 | * Importance of self-employment * Requirements for entry into self-employment * Role of an Entrepreneur in business * Contributions of Entrepreneurs to National development * Entrepreneurship culture in Kenya * Born or made entrepreneurs | * Individual/group assignments * Projects * Written tests * Oral questions * Third party report * Interviews |
| 1. Identify entrepreneurship opportunities | * 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 * Technology in business | * Individual/group assignments * Projects * Written tests * Oral questions * Third party report * Interviews |
| 1. Create entrepreneurial awareness | * 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 | * Individual/group assignments * Projects * Written tests * Oral questions * Third party report * Interviews |
| 1. Apply entrepreneurial motivation | * Internal and external motivation * Motivational theories * Self-assessment * Entrepreneurial orientation * Effective communications in entrepreneurship * Principles of communication * Entrepreneurial motivation | * Case studies * Individual/group assignments * Projects * Written tests * Oral questions * Third party report * Interviews |
| 1. Develop business innovative strategies | * Innovation in business * Small business Strategic Plan * Creativity in business development * Linkages with other entrepreneurs * ICT in business growth and development | * Case studies * Individual/group assignments * Projects * Written tests * Oral questions * Third party report * Interviews |
| 1. Develop Business Plan | * Business description * Marketing plan * Organizational/Management * plan * Production/operation plan * Financial plan * Executive summary * Presentation of Business Plan | * Case studies * Individual/group assignments * Projects * Written tests * Oral questions * Third party report * Interviews |

**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/CAJ/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 | * Self-awareness * Formulating personal vision, mission and goals * Strategies for overcoming life challenges * Emotional intelligence * Assertiveness versus aggressiveness * Expressing personal thoughts, feelings and beliefs * 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 | * Written tests * Oral questioning * Interviewing * Portfolio of evidence * Third party report |
| 1. Demonstrate interpersonal communication | * Meaning of interpersonal communication * Listening skills * Types of audience * Writing skills * Reading skills * Meaning of empathy * Understanding customers’ needs * Establishing communication networks * Sharing information | * Written tests * Oral questioning * Interviewing * Portfolio of evidence * Third party report |
| 1. Demonstrate critical safe work habits | * Stress and stress management * Punctuality and time consciousness * Leisure * Integratingpersonal objectives into organizational objectives * Resources utilization * Setting work priorities * HIV and AIDS * Drug and substance abuse * Handling emerging issues | * Written tests * Oral questioning * Interviewing * Portfolio of evidence * Third party report |
| 1. Lead a small team | * Leadership qualities * Team building * Determination of team roles and objectives * Team performance indicators * Responsibilities in a team * Forms of communication * Complementing team activities * Gender and gender mainstreaming * Human rights * Maintaining relationships * Conflicts and conflict resolution | * Written tests * Oral questioning * Interviewing * Portfolio of evidence * Third party report |
| 1. Plan and organize work | * Functions of management * Planning * Organizing * Time management * Decision making process * Task allocation * Evaluating work activities * Resource utilization * Problem solving * Collecting and organising information | * Written tests * Oral questioning * Interviewing * Portfolio of evidence * Third party report |
| 1. Maintain professional growth and development | * 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 | * Written tests * Oral questioning * Interviewing * Portfolio of evidence * Third party report |
| 1. Demonstrate workplace learning | * 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 * Handling emerging issues * Future trends and concerns in learning | * Written tests * Oral questioning * Interviewing * Portfolio of evidence * Third party report |
| 1. Demonstrate problem solving skills | * Problem identification * Problem solving * Application of problem-solving strategies * Resolving customer concerns | * Written tests * Oral questioning * Interviewing * Portfolio of evidence * Third party report |
| 1. Demonstrate workplace ethics | * 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 | * 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

## ENVIRONMENTAL LITERACY

**UNIT CODE:** CON/CU/CAJ/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 | * 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 * Occupational Safety and Health Standards (OSHS) | * Written test * Oral questions * Observation |
| 1. Control environmental Pollution control | * 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 | * Written test * Oral questions * Observation |
| 1. Demonstrate sustainable resource use | * 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 | * Written test * Oral questions * Observation |
| 1. Evaluate current practices in relation to resource usage | * 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 | * Written test * Oral questions * Observation |
| 1. Identify Environmental legislations/conventions for environmental concerns | * Environmental issues/concerns * Environmental legislations /conventions and local ordinances * Industrial standard /environmental practices * International Environmental Protocols (Montreal, Kyoto) * Features of an environmental strategy | * Written questions * Oral questions * Observation |
| 1. Implement specific environmental programs | * 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 | * Written questions * Oral questions * Observation |
| 1. Monitor activities on Environmental protection/Programs | * 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 | * Oral questions * Written tests * Practical test * Observation |

**Suggested Methods of Instruction**

* Instructor led facilitation of theory
* Demonstration by trainer
* Viewing of related videos
* Project
* Assignements
* 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
* Ccompany environmental management systems (EMS)
* Montreal Protocol
* Kyoto Protocol

## OCCUPATIONAL SAFETY AND HEALTH PRACTICES

**UNIT CODE:** CON/CU/CAJ/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 | * 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 | * Oral questions * Written tests * Portfolio of evidence * Third party report |
| 1. Control OSH hazards | * Prevention and control measures, including use of PPE (personal protective equipment) for specific hazards are identified and implemented * 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 | * Oral questions * Written tests * Portfolio of evidence * Third party report |
| 1. Implement OSH programs | * 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 | * Oral questions * Written tests * Portfolio of evidence * Third party report |

**Suggested Methods of Instruction**

* Assigments
* 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**

BASIC MATHEMATICS

**UNIT CODE:** CON/CU/CAJ/CC/01/5/A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Apply Basic mathematics

**Duration of Unit:** 80 hours

**Unit Description**

This unit describes the competencies required by a technician in order to apply basic mathematics. It involves applying algebra, performing geometrical calculations, carrying out mensuration, applying statistics, applying graphs and charts, applying number series and indices and logarithms. It also entails applying Ratios, applying matrices, applying probability, performing commercial calculations, applying trigonometry and applying vectors.

**Summary of Learning Outcomes**

1. Apply Algebra
2. Perform geometrical calculations
3. Carry out Mensuration
4. Apply Statistics
5. Apply graphs and charts
6. Apply number series
7. Apply Indices and Logarithms
8. Apply Ratios
9. Apply matrices
10. Apply probability
11. Perform commercial calculations
12. Apply Trigonometry
13. Apply vectors

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Apply Algebra | * Simple quadratic equations * Methods of solving quadratic equations * Algebraic expressions * Transpose formulae * Uses of calculator * Solution of equations reduced to quadratic form * Solutions of simultaneous linear equations in three unknowns | * Written tests * Oral questioning * Assignments * Supervised exercises |
| 1. Carry out mensuration | * Perimeters, areas and volumes * Perimeters * Surface areas * Volume of solid and hollow figures * Areas of quadrilaterals, triangles and circles * Areas of regular and irregular figures * Parallelogram * Trapezium * Circle * Annulus * Spheres * Cones * Cylinders * pyramids * Sector * segment * Curved surface of a cylinder * Surface area of a pyramid and cones * Trapezoidal rule * Mid-ordinate rule * Simpson’s rule * Volumes of prisms, cones and pyramids | * Assignments * Oral questioning * Supervised exercises * Written tests |
| 1. Apply statistics | * Difference between groups and ungrouped data * Data collection * Data organization * Data representation * Tabulation of data * Interpretation of data from given charts | * Written tests * Oral questioning * Assignments * Supervised exercises |
| 1. Apply graphs and charts | * Types of linear graphs * Distance- time * Temperature- time * Area of cross section- volume * Velocity- distance * Interpretation from linear graphs * Parabolic curves * Solving simultaneous and quadratic equations by graphical method * Data presentation | * Written tests * Oral questioning * Assignments * Supervised exercises |
| 1. Apply number series | * Difference between sequence and series * Solving problems involving series * Compound and simple interest | * Written tests * Oral questioning * Assignments * Supervised exercises |
| 1. Apply indices and logarithms | * Conversion of numbers from one base to another * Application of laws of indices in solving exponential equations * Application of law of logarithm in solving logarithmic equations | * Written tests * Oral questioning * Assignments * Supervised exercises |
| 1. Apply ratios | * Difference between rational and irrational numbers * Expression of ratios as percentages * Solving problems involving direct and inverse proportions | * Written tests * Oral questioning * Assignments * Supervised exercises |
| 1. Apply matrices | * Operation on matrices * Determinant of a 2\*2 matrix * Inverse of a 2\*2 matrix * Application of matrices in solving simultaneous equations | * Written tests * Oral questioning * Assignments * Supervised exercises |
| 1. Apply probability | * Dependent and independent events * Application of laws of probability * Addition law * Multiplication law | * Written tests * Oral questioning * Assignments * Supervised exercises |
| 1. Perform commercial calculations | * Exchange rates * Prices and profit * Calculation of average sales * Calculation of incomes * Calculation of taxes | * Written tests * Oral questioning * Assignments * Supervised exercises |
| 1. Apply Trigonometry | * Conversion of degrees to radians and vice versa * Trigonometric ratios and their reciprocals * Prove simple trigonometric identities * Trigonometric equations * Trigonometric ratios of angles greater than 90 degrees * Solving triangles by use sine and cosine rules * Sine and cosine waves | * Written tests * Oral questioning * Assignments * Supervised exercises |
| 1. Apply vectors | * Manipulation of vectors * Resolution of vectors | * Written tests * Oral questioning * Assignments * Supervised exercises |

**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
* Reference materials

TECHNICAL DRAWING

**UNIT CODE:** CON/CU/CAJ/CC/02/5/A

**Relationship to Occupational Standards**

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

**Duration of Unit:** 60hours

**Unit Description**

This unit covers the competencies required to prepare and interpret technical drawings. It involves competencies to perform general communication. It also involves producing plain geometry drawings, orthographic and pictorial drawings, solid geometry, working drawings for building and producing perspective drawing.

**Summary of Learning Outcomes**

1. Perform General Communication
2. Produce plane geometry drawings
3. Produce orthographic and pictorial drawings
4. Produce solid geometry drawings
5. Produced working drawings for building
6. Produced perspective drawing

**Learning Outcomes, Content and Suggested Assessment Methods:**

| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| --- | --- | --- |
| 1. Perform General Communication | * Role of drawing as means of communication * Identification and care of drawing equipment * Identification and care of drawing materials * Procedures of laying and folding drawing papers * Drawing and printing quality lines and letters * Dimension * Drawing a given scale * 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) | * Observation * Oral questioning * Written tests |
| 1. Produce plane geometry drawings | * Reduction and enlarging figures by construction method * Construction of figures to other shapes of equal area * Construction of an ellipse using different methods from given lines and fixed points * Construction of a parabola * Construction of loci of points of sliding and rotating mechanism * Construction of helix * Types of lines in drawings | * Oral questioning * Practical tests * Observation |
| 1. Produce orthographic and pictorial drawings | * Drawing objects in first and third angles * Conversion of pictorial views into orthographic projections * Construction of isometric drawings of solids having curves and circles * Construction of oblique drawings of solids having curves and circles * Construction of isometric drawings of objects having inclined sides * Free hand sketching through lines and boxes * Use of lines and boxes to produce pictorial sketches | * Observation * Practical tests * Oral questioning |
| 1. Produce solid geometry drawings | * Drawing front elevation and plan of sectioned solids * Production of auxiliary views from elevations and plan * Projecting points of intersecting solid * Development of surfaces of intersecting solids * Development of surfaces of truncated regular solids | * Observation * Practical tests * Oral questioning |
| 1. Produced working drawings for building | * Identification of symbols for building materials * Drawing details of foundation, walls, floors * Drawing details of roofs and trusses * Drawing floor plans * Construction of elevations of houses * Designing simple objects * Designing drawings of buildings * Introduction to CAD | * Observation * Practical tests * Oral questioning |
| 1. Produced perspective drawing | * Meaning of perspective drawing * Drawing objects using one-point perspective * Drawing objects using two-point perspective | * Observation * Practical tests * Oral questioning |

**Suggested Methods of Instruction**

* 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

SCIENCE

**UNIT CODE:** CON/CU/CAJ/CC/03/5/A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Apply Science

**Duration of Unit:** 80 Hours

**Unit Description**

This unit describes the competence in apply science. It involves applying units of measurements, applying force, work, energy and power, applying friction, applying light and sound, applying Linear motion, applying general chemistry, applying primary and secondary cells, applying thermal properties of matter and applying pressure in fluids

**Summary of Learning Outcomes**

1. Apply units of measurements
2. Apply Force, work, energy and power
3. Apply Friction
4. Apply Light and sound
5. Apply Linear motion
6. Apply General chemistry
7. Apply primary and secondary cells
8. Apply thermal properties of matter
9. Apply pressure in fluids

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1 Apply units of measurements | * Selection of units of measurement * Conversion of units from one form to another | * Written tests * Oral * Practical tests |
| 2 Apply Force, work, energy and power | * Definition of force, work, energy and power * Application of force, work, energy and power * Law of conservation of energy * Mechanical advantage * Velocity ratio * Calculation of efficiency * Examples of simple machines * Levers * Pulleys * Inclined plane * Wheel and axle * Screw * Hydraulic press * Gears | * Written tests * Oral * Practical tests |
| 3 Apply Friction | * Definition of friction * Causes of friction * Advantages and disadvantages of friction * Coefficient of friction * Solving simple problems involving coefficient of friction | * Written tests * Oral Questioning * Practical tests |
| 4 Apply Light and sound | * Nature of light * Dispersion of light * Laws of reflection and refraction * Polarisation of light * Optical instruments * Amplitude, loudness and intensity of sound * velocity of sound * Measurements of velocity * Frequency * Resonance | * Written tests * Oral Questioning * Practical tests |
| 5 Apply Linear motion | * Definition of distance, displacement, speed and velocity and acceleration * Displacement * Interpretation of motion graphs * Scalar and vector quantities * Newton’s law of motion * Law of conservation of momentum * Simple calculations of motion | * Written tests * Oral Questioning * Practical tests |
| 6 Apply General chemistry | * Knowledge of experimental techniques * Recognize the structure of atoms * Types of bonds * Formation of bonds * Properties of bonds * Definition of acids, bases and salts * Difference between strong and weak acids and bases * Strength of chemical bonds | * Written tests * Oral Questioning * Practical tests |
| 8 Apply thermal properties of matter | * Sources of heat * Effects of heat on matter * Change of matter as heat varies * methods of heat transfer * Water heating | * Written tests * Oral Questioning * Practical tests |
| 9 Apply pressure in fluids and liquids | * Definition of pressure * Application of pressure * Simple calculations on pressure * Application of atmospheric and liquid pressure * Definition of density and relative density * Variations of pressure * Laws of flotation * Solving simple problems involving liquids of different densities | * Written tests * Oral Questioning * Practical tests |

**Suggested Methods of Instruction**

* Demonstration by trainer
* Practical work by trainee
* Demonstration videos
* Trainee group discussions

**Recommended Resources**

**Tools and equipment**

* Laboratory testing equipment
* Laboratory apparatus
* Hand tools
* Machine tools

**Materials and supplies**

* Construction materials
* Stationery
* Oils
* Cells
* Pins
* Candles
* Acids and bases
* Steel rods
* Iron fillings

**Personal protective equipment (PPEs)**

* Safety boots
* Goggles
* Gas masks
* Helmets
* Gloves
* Dust coats
* First aid kit
* Ear muffs
* Dust masks
* Overalls

TEMPORARY WORKS

**UNIT CODE:** CON/CU/CAJ/04/5/A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: construct temporary works.

**Duration of Unit:** 75 hours

**Unit Description**

This Unit describes the competencies required to execute temporary works. It involves selecting, preparing and using materials, tools and equipment, constructing and dismantling trench timbering, constructing and dismantling building formwork/shuttering erecting and dismantling building scaffold and erecting and dismantling building shores

**Summary of Learning Outcomes**

1. Select, prepare and use materials, tools and equipment

2. Construct and dismantle trench timbering

3. Construct and dismantle building formwork/shuttering

4. Erect and dismantle building scaffold

5. Erect and dismantle building shores

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Select, prepare and use materials, tools and equipment | * cutting list * economy in the use of materials, tools and equipment * types of tools and materials * boards * nails * hammers * saws * tape measures * squares * observation of safety and precautions | * Practical assignment * Oral Questioning * written |
| 2. Construct and dismantle trench timbering | * types of soil * firm * loose * water-logged * types of timber * construction tools and equipment * Personal protective equipment * Construction of trench timbering * dismantling trench timbering | * Practical assignment * Oral Questioning * Written Tests |
| 3. Construct and dismantle building formwork/shuttering | * Types of formwork * Formwork dimensions * Personal protective equipment * Construction formwork for stairs * Oiling of timber formwork surface * Formwork is fixed into position * Dismantling of formwork | * Practical assignment * Oral Questioning * Written Tests |
| 4.Erect and dismantle building scaffold | * Scaffold systems * Personal protective equipment * Erection of scaffolds * Dismantling Scaffolds * Housekeeping procedures | * Written Tests * Oral Questioning * practical assignment |
| 5. Erect and dismantle building shores | * Type of shores * Shoring materials * Personal protective equipment * Erection of Shores * dismantling Shores | * Written tests * Oral Questioning * practical assignment |

**Suggested Methods of Instruction**

* Demonstration by trainer
* Practical work by trainee
* Demonstration videos
* Group discussions

**Recommended Resources**

**Tools and equipment**

* measuring and drawing tools
* carpentry and joinery toolsand equipment
* saws
* hammers
* tape measures

**Materials and supplies**

* Building Codes
* Timber
* Props
* Nails
* Ply wood

**Personal protective equipment (PPEs)**

* dust coat
* First aid kits
* Overalls
* Safety boots
* Safety goggles
* Helmets
* Gloves

## SITE AND WORKSHP MANAGEMENT

**UNIT CODE:** CON/CU/CAJ/CC/05/5/A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: manage sites and workshops.

**Duration of Unit:**  80 hours

**Unit Description**

This Unit describes the competencies required to manage sites and workshops. It involves identifying workshop/ sites, identifying Regulations governing workshop design, planning workshop layout, preparing, using and maintaining materials, tools and equipment and executing contracts. It also entails; managing construction firm, performing office practice and maintaining Labour Relations

**Summary of Learning Outcomes**

1. Identify workshop/ sites

2. Identify Regulations governing workshop design

3. Plan workshop layout

4. Prepare, use and maintain materials, tools and equipment

5. Execute contracts

6. Manage construction firm

7. Perform office practice

8. Maintain Labour Relations

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Identify workshop/ sites | * suitable workshop site * hoarding and fencing * local authority requirements * essential services for a workshop/site * mode of transport * site identification boards | * Oral Questioning * Written Tests |
| 2. Identify Regulations governing workshop design | * welfare regulations * health regulations * safety regulations | * Oral Questioning * Written Tests |
| 3. Plan workshop layout | * Identification of working areas * Identification of storage areas * Identification of washrooms * Identification of machine shops * Identification of offices * Identification of Tools store | * Oral Questioning * Written Tests |
| 4.Prepare, use and maintain materials, tools and equipment | * Ordering and supplying documents * Records of incoming and outgoing materials * Method of storing materials on site * Preparation and maintenance of inventories * Control in use of materials * Security of materials, tools and equipment * Sources of capital * Methods of maintaining tools, equipment and machines | * Written Tests * Oral Questioning |
| 5. Execute contracts | * Parties involved in a project * Types of contracts * Types of contract documents * Methods of tendering * Site operations and construction method * Types of construction plant * Number of required sub-contractors * Construction programmes | * Written tests * Oral Questioning |
| 6. Manage construction firm | * Structure of a firm * Importance of discipline in firms * Motivation of workers | * Written tests * Oral Questioning |
| 7. Perform office practice | * Essential office equipment * Systems of filing * Methods of communication * Use of office documents * Methods of taxation * Importance of site meetings | * Written tests * Oral Questioning |
| 8. Maintain Labour Relations | * Role of trade unions in the construction industry * Importance of industrial training * Regulations governing employment in construction industry * Importance of factories act | * Written tests * Oral Questioning |

**Suggested Methods of Instruction**

* Demonstration by trainer
* Demonstration videos
* Group discussions

**Recommended Resources**

**Materials and supplies**

* Reference materials **(books, handouts, manuals and magazines)**

**CORE UNITS OF LEARNING**

DOORS AND DOOR FRAMES

**UNIT CODE:** CON/CU/CAJ/CR/01/5/A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Construct doors and door frames

**Duration of Unit:** 120 hours

**Unit Description**

This unit describes the competence required to construct doors and door frames. It involves; interpreting working drawing, preparing construction materials, constructing basic doors, constructing special doors & door frames, constructing fire check doors & door frames, performing finishing processes, examine quality of the finished product and performing workplace housekeeping.

**Summary of Learning Outcomes**

1. Interpret working drawing
2. Prepare Construction materials
3. Construct basic doors
4. Construct special doors & door frames
5. Construct fire check doors & door frames
6. Perform finishing processes
7. Examine quality of the finished product
8. Perform workplace housekeeping

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Interpret working drawing | * Elevation * Sections * Dimensions * Scale * Symbols | * Practical assignment * Oral Questioning * Written Tests |
| 1. Prepare Construction materials | * Interpretation of working drawing * Preparation of a cutting list * Types of construction materials * Timber * Ply wood * Nails and screws * Wood glue * Sand paper * Block board * Plaster boards * Asbestos * Uses and specifications of materials, tools and equipment * Safety Practices * PPE * Handling of tools, materials and equipment * Good housekeeping | * Practical assignment * Oral Questioning * Written Tests |
| 1. Construct basic doors and door frames | * Marking out tools * Tape measure * Try square * Marking gauge * Workshop rod * Marking out procedures * Mark mortise * Mark tenons * Mark grooves * Mark rebate * Mark chamfer * Types of cutting out tools * Saws * Chisels * Mallet * Planes * Cutting procedure * Cut out mortises * Cut out tenons * Cut out the grooves * Cut out rebates * Cut out chamfers * Types of fitting tools * Hammers * Screw drivers * Wood glue * Nails * Screws * Clamps * Dowels * Types of joints * Mortise and tenon * Tongue and grooves * Scribes joints * Rebate * Procedure of fitting joints * Apply glue to tenons and mortises * Fit tenons to mortises * Fit battens to grooves * Fit stiles * Clamp the door * Fix the joints * Cut and fix the braces * Hanging door in frame * Fixing ironmongery /hardware * Lock * Tower bolts * Door closers * Door pullers | * Practical assignment * Oral Questioning * Written Tests |
| 1. Construct special doors & door frames | * Marking special doors * Marking special joints * Marking special shapes * Cutting product profile of special doors * Cutting special joints * Cutting shapes * Types of cutting out tools * Saws * Chisels * Mallet * Planes * Spoke shave * Cutting procedure * Cut out mortises * Cut out tenons * Cut out the grooves * Cut out rebates * Cut out chamfers * Cut out special shapes * Types of joints * Mortise and tenon * Tongue and grooves * Scribes joints * Rebate * Hammer headed key * Dove tail key * Procedure of fitting joints * Apply glue to tenons and mortises * Fit tenons to mortises * Fit battens to grooves * Fit stiles * Clamp the door * Fix the joints * Cut and fix the braces * Fixing door in the frame * Fixing ironmongery /hardware * Lock * Tower bolts * Door closers * Door pullers | * Practical assignment * Oral Questioning * Written Tests |
| 1. Construct fire check doors & door frames | * Marking out tools * Tape measure * Try square * Marking gauge * Workshop rod * Marking out procedures * Mark mortise * Mark tenons * Mark grooves * Mark rebate * Mark chamfer * Types of cutting out tools * Saws * Chisels * Mallet * Planes * Spoke shave * Cutting procedure * Cut out mortises * Cut out tenons * Cut out the grooves * Cut out rebates * Cut out chamfers * Cut out special shapes * Types of joints * Mortise and tenon * Tongue and grooves * Scribes joints * Rebate * Hammer headed key * Dove tail key * Procedure of fitting joints * Apply glue to tenons and mortises * Fit tenons to mortises * Fit battens to grooves * Fit stiles * Clamp the door * Fix the joints * Cut and fix the braces * Assembly of fire check doors * Fixing fire check materials * Covering both sides with plywood * Fixing lipping all round * Hanging door in the frame * Fixing ironmongery /hardware * Lock * Tower bolts * Door closers * Door pullers | * Written Tests * Oral Questioning * practical assignment |
| 1. Perform finishing processes | * Types of finishing processes * Wipe excessive glue * Apply filler to any dent * Sanding * Varnishing or painting | * Oral Questioning * practical assignments * Written Tests |
| 1. Examine quality of the finished product | * Fitness and joint quality * Final appearance * Function ability of the door | * Oral Questioning * practical assignments * Written Tests |
| 1. Perform workplace Housekeeping | * Housekeeping procedures * Gather off cuts * Gather shavings/ saw dust * Clean the floor * return tools to the store | * Oral Questioning * practical assignments * Written Tests |

**Suggested Methods of Instruction**

* Demonstration by trainer
* Practical work by trainee
* Demonstration videos
* Group discussions

**Recommended Resources**

**Tools and equipment**

* Carpentry and joinery hand tools
* Saws
* Hammers
* Planes
* Gauges
* Chisels
* Squares
* Tape measure
* Spoke shave

**Materials and supplies**

* Codes of practice
* Reference books
* Timber nails
* Screws
* Sand papers
* Varnish
* Wood glue
* Plaster boards
* asbestos

**Personal protective equipment (PPEs)**

* dust coat
* First aid kits
* Googles
* Glooves
* Safety boots

WINDOWS & WINDOW FRAMES

**UNIT CODE:** CON/CU/CAJ/CR/02/5/A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: construct windows and window frames

**Duration of Unit:**  100 hours

**Unit Description**

This Unit describes the competencies required to construct windows and window frames. It involves interpreting working drawing, preparing construction materials, constructing ordinary casement windows &window frames, constructing special windows and window frames, performing finishing processes, examining quality of the finished product and performing workplace housekeeping.

**Summary of Learning Outcomes**

1. Interpret working drawing

2. Prepare Construction materials

3. Construct ordinary casement windows and window frames

4. Construct special windows and window frames

5. Perform finishing processes

6. Examine quality of the finished product

7. Perform workplace Housekeeping

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Interpret working drawing | * Elevation * Sections * Dimensions * Scale * Symbols | * Practical assignment * Oral Questioning/Written Tests |
| 1. Prepare Construction materials | * Interpretation of working drawing * Preparation of a cutting list * Types of construction materials * Timber * Ply wood * Nails and screws * Wood glue * Sand paper * Uses and specifications of materials, tools and equipment * Safety Practices * PPE * Handling of tools, materials and equipment * Good housekeeping | * Practical assignment * Oral Questioning * Written Tests |
| 1. Construct ordinary casement windows and window frames | * Side hung windows * Top hung windows * Bottom hung windows * Double hung windows * Marking out tools * Tape measure * Try square * Marking gauge * Workshop rod * Marking out procedures * Mark mortise * Mark tenons * Mark grooves * Mark rebate * Mark chamfer * Types of cutting out tools * Saws * Chisels * Mallet * Planes * Cutting procedure * Cut out mortises * Cut out tenons * Cut out the grooves * Cut out rebates * Cut out chamfers * Types of fitting tools * Hammers * Screw drivers * Wood glue * Nails * Screws * Clamps * Dowels * Types of joints * Mortise and tenon * Tongue and grooves * Scribes joints * Rebate * Procedure of fitting joints * Apply glue to tenons and mortises * Fit tenons to mortises * Fit battens to grooves * Fit stiles * Clamp the window * Fix the joints * Fixing window in the frame * Fixing ironmongery /hardware * Hinges * Stays * fasteners | * Practical assignment * Oral Questioning * Written Tests |
| 1. Construct special windows and window frames | * Horizontal sliding * Vertical sliding * Centre pivoted * Bay window * Marking out tools * Tape measure * Try square * Marking gauge * Workshop rod * Marking out procedures * Mark mortise * Mark tenons * Mark grooves * Mark rebate * Mark chamfer * Types of cutting out tools * Saws * Chisels * Mallet * Planes * Cutting procedure * Cut out mortises * Cut out tenons * Cut out the grooves * Cut out rebates * Cut out chamfers * Types of fitting tools * Hammers * Screw drivers * Wood glue * Nails * Screws * Clamps * Dowels * Types of joints * Mortise and tenon * Tongue and grooves * Scribes joints * Rebate * Procedure of fitting joints * Apply glue to tenons and mortises * Fit tenons to mortises * Fit battens to grooves * Fit stiles * Clamp the window * Fix the joints * Fixing window in the frame * Fixing ironmongery /hardware * Hinges * Stays * fasteners | * Practical assignment * Oral Questioning * Written Tests |
| 1. Perform finishing processes | * Types of finishing processes * Wipe excessive glue * Apply filler to any dent * Sanding * Varnishing or painting | * Written Tests * Oral Questioning * practical assignment |
| 1. Examine quality of the finished product | * + Fitness and joint quality   + Final appearance   + Function ability of the window | * Oral Questioning * practical assignments * Written Tests |
| 1. Perform workplace Housekeeping | * Housekeeping procedures * Gather off cuts * Gather shavings/ saw dust * Clean the floor * Return tools to the store | * Oral Questioning * practical assignments * Written Tests |

**Suggested Methods of Instruction**

* Demonstration by trainer
* Practical work by trainee
* Demonstration videos
* Group discussions

**Recommended Resources**

**Tools and equipment**

* Carpentry and joinery hand tools
* Saws
* Hammers
* Planes
* Gauges
* Chisels
* Squares
* Tape measure

**Materials and supplies**

* Codes of practice
* Reference books
* Timber
* Screws
* Nails
* Wood glue
* Varnish

**Personal protective equipment (PPEs)**

* dust coat
* First aid kits
* Overalls
* Gum boots
* Safety goggles
* Helmets
* Gloves

FURNITURE ITEMS

**UNIT CODE:** CON/CU/CAJ/CR/03/5/A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Construct furniture items

**Duration of Unit:**  100 hours

**Unit Description**

This unit describes the competences required to construct furniture items. It involves interpreting working drawing, preparing construction materials, marking out product profile, cutting out product profile and performing fixing of the joints. It also includes performing finishing processes, examining quality of the finished product and performing workplace housekeeping.

**Summary of Learning Outcomes**

* 1. Interpret working drawing
  2. Prepare Construction materials
  3. Marking out product profile
  4. Cut out product profile
  5. Perform fixing of the joints
  6. Perform finishing processes
  7. examining quality of the finished product
  8. performing workplace housekeeping**.**

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Interpret working drawing | * Elevation * Sections * Dimensions * Scale * Symbols | * Practical assignment * Oral Questioning * Written Tests |
| 1. Prepare Construction materials | * Interpretation of working drawing * Preparation of a cutting list * Types of construction materials * Timber * Ply wood * Nails and screws * Wood glue * Sand paper * Block board * MDF * Veneer * formica * Uses and specifications of materials, tools and equipment * Safety Practices * PPE * Handling of tools, materials and equipment * Good housekeeping | * Practical assignment * Oral Questioning * Written Tests |
| 1. Mark out product profile | * Marking out tools * Tape measure * Try square * Marking gauge * Workshop rod * Compass * Bevel square * Bradawl * Cutting gauge * Marking out procedures * Mark mortise * Mark tenons * Mark grooves * Mark rebate * Mark chamfer * Mark curves and circles | * Practical assignment * Oral Questioning * Written Tests |
| 1. Cut out product profile | * Types of cutting out tools * Saws * Chisels * Mallet * Planes * Drills * Spoke shave * Wood file * Cutting procedure * Cut out mortises * Cut out tenons * Cut out the grooves * Cut out trenches * Cut out rebates * Cut out chamfers | * Practical assignment * Oral Questioning * Written Tests |
| 1. Perform fitting of the joints | * Types of fitting tools * Hammers * Screw drivers * Wood glue * Nails * Screws * Clamps * Dowels * Mallet * Types of joints * Mortise and tenon * Tongue and grooves * Scribes joints * Rebate * Mitre * Procedure of fitting joints * Apply glue to tenons and mortises * Fit tenons to mortises * Fit battens to grooves * Fit stiles * Clamp the window * Fix the joints * Cut and fix the braces | * Written Tests * Oral Questioning * practical assignment |
| 1. Perform finishing processes | * Types of finishing processes * Wipe excessive glue * Apply filler to any dent * Sanding apply coat of varnish * Fixing ironmongery /hardware * Drawer locks * Hinges * Pullers * Handles * catches | * Oral Questioning * practical assignments * Written Tests |
| 1. Examine quality of the finished product | * Fitness and joint quality * Final appearance * Function ability of the furniture | * Oral Questioning * practical assignments * Written Tests |
| 1. Perform workplace Housekeeping | * Housekeeping procedures * Gather off cuts * Gather shavings/ saw dust * Clean the floor * Return tools to the store | * Oral Questioning * practical assignments * Written Tests |

**Suggested Methods of Instruction**

* Demonstration by trainer
* Practical work by trainee
* Demonstration videos
* Group discussions

**Recommended Resources**

**Tools and equipment**

* Reference materials
* Occupational Safety and health manuals
* Jack plane
* Saws
* Chisels
* Hammers
* Tape measure
* Mallet
* Screw drivers
* Drills
* Square
* Marking gauge
* Steel rule
* Sash and T clamps
* Bench hold fast
* Mitre box
* Brace
* pincers

**Materials and supplies**

* Sand paper
* Timber
* Manufactured boards
* Wood glue
* Formica
* Nuts and bolts
* Nails and screws

**Personal protective equipment (PPEs)**

* Overalls
* Safety boots
* First aid kits
* Safety goggles
* Helmets
* Gloves
* Dust coats
* Ear muffs

ROOF STRUCTURES

**UNIT CODE:** CON/CU/CAJ/CR/04/5/A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: construct and erect roof structures

**Duration of Unit:** 120 hours

**Unit Description**

This unit describes the competence in constructing and erecting roof structures. It involves interpreting architectural drawings, selecting and preparing tools, materials and equipment, setting out roof trusses, cutting out the joints, assembling of truss members and erecting roof trusses. It also includes performing fixing of purlins, performing trimming of roof members, fixing roof covering materials, performing finishing at the eaves and other finishing processes

**Summary of Learning Outcomes**

* 1. Interpret Architectural drawings
  2. Select and prepare tools, materials and equipment
  3. Set out roof trusses
  4. Cut out the joints
  5. Assemble of truss members
  6. Erect roof trusses
  7. Perform fixing of purlins
  8. Perform trimming of roof members
  9. Fix roof covering material
  10. Perform finishing at the eaves
  11. Construct ceiling
  12. Perform finishing processes

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Interpret Architectural drawings | * Draw the details of roofs * Elevations * Sections * Scales * Dimensions * Symbols * Sketching * Types of roofs * Joints * Details of eaves * Cross-section through the ceiling and roofs * By-law requirements on roofs | * Written Tests * Oral Questioning * Practical tests |
| 1. Select and prepare tools, materials and equipment | * Roof materials * Types of roofs * Single * Double * Triple * Trussed * Selection of timber * Defects in timber * Availability * Common timber used in Kenya * Nominal sizes of timber * 150\*50 * 50\*100 * 75\*50 * 50\*50 * 200\*25 * Tools and materials * Bolts and nuts * Timber connectors * Carpentry and joinery hand tools * Care and maintenance of tools * Methods of preservation of timber | * Written tests * Oral Questioning * Practical tests |
| 1. Set out roof trusses | * Types of setting out tools * Saws * Woollen tape * Hammers * Squares * Procedure of setting out * Types of roof trusses | * Written tests * Oral Questioning * Practical tests |
| 1. Cut out the joints | * Plumb cut * Seat cut * ½ lapped halved dovetail * Scarf joints | * Written tests * Oral Questioning * Practical tests |
| 1. Assemble of truss members | * Types of truss members * Ridge piece * Rafters * King post * Braces * Ties * Assemble of truss members | * Written tests * Oral Questioning   Practical tests |
| 1. Erect roof trusses | * Plumb the trusses * Fixing truss on purlin | * Written tests * Oral Questioning * Practical tests |
| 1. Perform fixing of purlins | * Fixing tools * Plumb-bob * Hammer * Saws * Tape measure * Try square * Fixing procedures * Cut joints * Align the purlins to the truss * Fix the purlins * Remove temporary support | * Written tests * Oral Questioning * Practical tests |
| 1. Perform trimming of roof members | * Procedure of trimming roof members * Trim the purlins * Trim the rafters | * Written tests * Oral Questioning * Practical tests |
| 1. Fix roof covering material | * Types of roof covering materials * Corrugated sheets * Asbestos sheets * Tiles * Shingles * Fixing procedure | * Written tests * Oral Questioning * Practical tests |
| 1. Perform finishing at the eaves | * Details of eaves * Finishing procedures * Cut bevels of roof members * Fix the fascial board * Fix the soffit board * Fix the gutter and down pipes | * Written tests * Oral Questioning * Practical tests |
| 1. Construct ceiling | * Constructing a ceiling framework * Fixing ceiling covering material to framework * Type of ceiling material * Methods of fixing | * Written tests * Oral Questioning * Practical tests |
| 1. Perform finishing processes | * Application of varnish/ paint * Housekeeping procedures | * Written tests * Oral Questioning * Practical tests |

**Suggested Methods of Instruction**

* Demonstration by trainer
* Practical work by trainee
* Demonstration videos
* Group discussions

**Recommended Resources**

**Tools and equipment**

* Carpentry tools
* Reference materials
* Occupational Safety and health manuals

**Materials and supplies**

* Timber
* Nails
* Screws
* Nuts and bolts

**Personal protective equipment (PPEs)**

* Safety boots
* Gloves
* Dust coats
* First aid kit
* Ear muffs
* Dust mask

JOINERS SECOND FIXING

**UNIT CODE:** CON/CU/CAJ/CR/05/5A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Perform joiners second fixing

**Duration of Unit:** 100 hours

**Unit Description**

This Unit describes the competencies required to perform joiners second fixing. It involves, interpreting architectural drawings, selecting materials, tools and equipment, performing fixing of the fixtures, examining the quality of the finished product and performing housekeeping.

**Summary of Learning Outcomes**

* 1. Interpret architectural drawings
  2. Select materials, tools and equipment
  3. Perform fixing the fixtures
  4. Examine the quality of the finished product
  5. Perform work place housekeeping

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1.Interpret architectural drawings | * Elevations * Sections * Scales * Dimensions | * Practical assignment * Written Tests * Oral Questioning |
| 2. Select materials, tools and equipment | * Cutting list * Materials requirement * Timber * Wood glue * Nails and screws * Tools and equipment * Hammers * Drills * Plugging chisels * Saws * Tape measures | * Practical assignment * Written Tests * Oral Questioning |
| 3. Perform fixing the fixtures | * Procedure of fixing fixtures * Mark and cut joints * Mark and drill holes for plugs * Fix the plugs * Fix the fixtures * Tools and equipment | * Practical assignment * Written Tests * Oral Questioning |
| 4. Examine the quality of the finished product | * Quality of the joints * Final appearance | * Practical assignment * Written Tests * Oral Questioning |
| 5. Perform work place housekeeping | * Housekeeping procedures * Gather off-cuts * Gather wood shavings * Clean the floor * Tools and equipment | * Practical assignment * Written Tests * Oral Questioning |

**Suggested Methods of Instruction**

* Demonstration by trainer
* Practical work by trainee
* Demonstration videos
* Group discussions

**Recommended Resources**

**Tools and equipment**

* Hammers
* Drills
* Plugging chisels
* Saws
* Tape measures

**Materials and supplies**

* Timber
* Wood glue
* Nails and screws

**Personal protective equipment (PPEs)**

* Overall
* Helmet
* Safety boots
* Masks
* Gloves
* First aid kit
* Reflectors
* Safety goggles

TIMBER FLOORS AND PREFABRICATED BUILDINGS

**UNIT CODE:** CON/CU/CAJ/CR/06/5/A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Construct timber floors and prefabricated buildings

**Duration of Unit:** 100 hours

**Unit Description**

This unit describes the competences required to construct timber floors and prefabricated buildings. It entails interpreting structural drawing, selecting materials, tools and equipment, setting and constructing timber prefabricated structures, erecting the timber prefabricated structure, constructing timber floors and performing finishing activities.

**Summary of Learning Outcomes**

1. Interpret structural drawing

2. Select materials, tools and equipment

3. Set and construct timber prefabricated structures

4. Construct timber floors

5. perform finishing activities.

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Interpret structural drawing | * Elevations * Sections * Scale * dimensions | * Written tests * Oral Questioning * Practical tests/Project |
| 1. Select materials, tools and equipment | * Materials required * Timber * Nails and screws * Bolts * Nuts and washers * Tools and equipment required * Hammer * Drills * Saws * Tape measure | * Written tests * Oral Questioning * Practical tests/Project |
| 1. Set and construct timber prefabricated structures | * Setting out prefabricated structure * Erecting prefabricated structure * Fixing the prefabricated structure | * Written tests * Oral Questioning * Practical tests * Project |
| 1. Construct timber floors | * Laying out of joists * Strutting of the joists * Fixing of the floor boards | * Written tests * Oral Questioning * Practical tests * Project |
| 1. Perform finishing activities | * Procedure of finishing * Smooth plane the boards * Sand the boards * Application of varnish * Housekeeping procedures | * Written tests * Oral Questioning * Practical tests * Project |

**Suggested Methods of Instruction**

* Demonstration by trainer
* Practical work by trainee
* Demonstration videos
* Group discussions

**Recommended Resources**

**Tools and equipment**

* Hammers
* Drills
* Saws
* Tape measures

**Materials and supplies**

* Timber
* Nails and screws
* Bolts
* Nuts and washers

**Personal protective equipment (PPEs)**

* Gum boots
* Helmets
* Gloves
* Dust coats
* First aid kits

CONSTRUCTION OF TIMBER STAIRS

**UNIT CODE:** CON/CU/CAJ/CR/07/5/A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Construct timber stairs

**Duration of Unit:**  100 hours

**Unit Description**

This unit describes the competences required to construct timber stairs. It entails designing timber stairs, selecting materials, tools and equipment, marking out joints, cutting out joints, performing trial and final assembly of staircase and performing finishing processes.

**Summary of Learning Outcomes**

1. Design timber stairs
2. Select materials, tools and equipment
3. Mark out joints
4. Cut out joints
5. Perform trial and final assembly of staircase.
6. Perform finishing processes

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Design timber stairs | * Sketching of timber stairs * Classes of timber stairs * Private * Public * Designing timber stairs * Rise * Run * Type of building * Formula * Building code * Angle of pitch of the stair * Architectural drawing | * Practical assignment * Oral Questioning * Written Tests |
| 1. Select materials, tools and equipment | * Safety Practices * Handling of tools, materials and equipment * Good housekeeping * Interpretation of working drawing * Preparation of a cutting list * Types of construction materials * Timber * Nails and screws * Wood glue * Sand paper * Block board * Uses and specifications of materials, tools and equipment | * Practical assignment * Oral Questioning * Written |
| 1. Mark out joints | * Marking out tools * Tape measure * Try square * Marking gauge * Workshop rod * Compass * Bevel square * Bradawl * Cutting gauge * Marking out procedures * Mark mortise * Mark tenons * Mark grooves * Mark rebate * Mark chamfer * Mark curves and circles * Mark trenches | * Practical assignment * Oral Questioning * Written Tests |
| 1. Cut out joints | * Types of cutting out tools * Saws * Chisels * Mallet * Planes * Drills * Spoke shave * Wood file * Rebate plane * Plough plane * Cutting procedure * Cut out mortises * Cut out tenons * Cut out the grooves * Cut out trenches * Cut out rebates * Cut out chamfers | * Practical assignment * Oral Questioning * Written Tests |
| 1. Perform trial and final assembly of staircase. | * Types of fitting tools * Hammers * Screw drivers * Clamps * Mallet * Types of joints * Mortise and tenon * Tongue and grooves * Scribes joints * Rebate * Mitre * Procedure of fitting joints * Apply glue to tenons and mortises * Fit tenons to mortises * Dowels a * Clamp the staircase * Fix the joints * Fix risers and treads to stringer * Fix balusters to stringer and hand rail | * Written Tests * Oral Questioning * practical assignment |
| 1. Perform finishing processes | * Types of finishing processes * Wipe excessive glue * Apply filler to any dent * Sanding * apply coats of varnish * workplace housekeeping procedures | * Oral Questioning * practical assignments * Written Tests |

**Suggested Methods of Instruction**

* Demonstration by trainer
* Practical work by trainee
* Demonstration videos
* Group discussions

**Recommended Resources**

**Tools and equipment**

* Jack plane
* Saws
* Chisels
* Hammers
* Tape measure
* Mallet
* Screw drivers
* Drills
* Square
* Marking gauge
* Steel rule
* Sash and T clamps
* Bench hold fast
* Mitre box
* Brace
* pincers

**Materials and supplies**

* Sand paper
* Timber
* Manufactured boards
* Wood glue
* Formica
* Nuts and bolts
* Nails and screws
* Reference materials
* Occupational Safety and health manuals

**Personal protective equipment (PPEs)**

* Overalls
* Safety boots
* First aid kits
* Safety goggles
* Helmets
* Gloves
* Dust coats
* Ear muffs