****

**REPUBLIC OF KENYA**

**COMPETENCY BASED CURRICULUM**

**FOR**

**SCAFFOLDING TECHNOLOGY**

**LEVEL 5**

|  |  |
| --- | --- |
| TVET CDACC  P.O. BOX 15745-00100  NAIROBI | KABETE NATIONAL POLYTECHNIC  P.O BOX 29010-00625  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 in the formulation of the Policy Framework for Reforming Education and Training (Sessional Paper No. 4 of 2016). A key feature of this policy is the radical change in the design and delivery of 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 the 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 safety of workers in the Construction Sector and development of competent human resource.

**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 and Sessional Paper No. 4 of 2016 on Reforming Education and Training in Kenya, emphasized the need to reform Curriculum development, assessment and certification. This called for a shift to CBET in order 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.

The TVET Curriculum Development, Assessment and Certification Council (TVET CDACC), in conjunction with Construction Sector Skills Advisory Committee (SSAC), Kabete National Polytechnic in partnership with National Construction Authority, Kenya Federation of Master Builders (KFMB) and Chamber of Skilled Craft Frankfurt Rhein Main (Germany) through the Kenya Initiative for Vocational Education and Training (KeVET) project 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, Kabete National Polytechnic, National Construction Authority, Kenya Federation of Master Builders, Chamber of Skilled Craft Frankfurt Rhein Main, expert workers and all those who participated in the development of this Curriculum.

**CHAIRPERSON, TVET CDACC**

# ACKNOWLEDGMENT

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 organisations.

I appreciate Kabete National Polytechnic, National Construction Authority, Kenya Federation of Master Builders, Chamber of Skilled Craft Frankfurt Rhein Main for the collaboration and partnership that enabled the development of this Curriculum. I also recognize with appreciation the role of the Construction Sector Skills Advisory Committee (SSAC) in ensuring that competencies required by the industry are addressed in the 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 safety for workers in the construction sector and promote acquisition of competencies that will enable them to perform their work more efficiently.

**COUNCIL SECRETARY/CEO**

**TVET CDACC**

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# ABBREVIATIONS AND ACRONYMS

BC Basic Competency

CBET Competency Based Education and Training

CC Common competency

CDACC Curriculum Development, Assessment and Certification Council

CON Construction

CR Core Competency

CU Curriculum

KCSE Kenya Certificate of Secondary Education

KNQA Kenya National Qualifications Authority

PPE Personal Protective Equipment

SSAC Sector Skills Advisory Committee

TD Technical Drawing

TVET Technical and Vocational Education and Training

# KEY TO UNIT CODE

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

Industry or sector

Curriculum

Occupational area

Type of competency

Competency number

Competency level

Version Control

# COURSE OVERVIEW

Scaffolding Craftsperson Level 5 qualification consists of competencies that an individual must achieve to develop basic scaffold sketches, develop work schedules, and erect and dismantle scaffolds. It also entails evaluating scaffolds integrity and overseeing safety compliance at the scaffolding site.

The units of learning for Scaffolding Technology level 5 include the following:

**Basic Units of Learning**

|  |  |  |  |
| --- | --- | --- | --- |
| **Unit Code** | **Unit Title** | **Duration in Hours** | **Credit Factor** |
| CON/CU/ST/BC/01/5/A | Communication skills | 25 | 2.5 |
| CON/CU/ST/BC/02/5/A | Digital literacy | 45 | 4.5 |
| CON/CU/ST/BC/03/5/A | Entrepreneurial skills | 70 | 7.0 |
| CON/CU/ST/BC/04/5/A | Employability skills | 50 | 5.0 |
| CON/CU/ST/BC/05/5/A | Environmental literacy | 25 | 2.5 |
| CON/CU/ST/BC/06/5/A | Occupational safety and health practices | 25 | 2.5 |
| **Total** | | **240** | 24.0 |

**Common Units of Learning**

|  |  |  |  |
| --- | --- | --- | --- |
| **Unit Code** | **Unit Title** | **Duration in Hours** | **Credit Factor** |
| CON/CU/ST/CC/01/5/A | Technical drawing | 120 | 12.0 |
| CON/CU/ST/CC/02/5/A | Engineering mathematics | 120 | 12.0 |
| CON/CU/ST/CC/03/5/A | Application of scientific principles | 80 | 8.0 |
| CON/CU/ST/CC/04/5/A | Workshop technology Practices | 100 | 10.0 |
| **Total** | | **420** | **42.0** |

**Core Units of Learning**

|  |  |  |  |
| --- | --- | --- | --- |
| **Unit Code** | **Unit Title** | **Duration in Hours** | **Credit factor** |
| CON/CU/ST/CR/01/5/A | Basic scaffold sketches | 120 | 12.0 |
| CON/CU/ST/CR/02/5/A | Scheduling Scaffold works | 120 | 12.0 |
| CON/CU/ST/CR/03/5/A | Scaffolds erection and dismantling | 180 | 18.0 |
| CON/CU/ST/CR/04/5/A | Scaffolds integrity | 120 | 12.0 |
| CON/CU/ST/CR/05/5/A | Safety Compliance | 120 | 12.0 |
|  | Industrial attachment | 360 | 36.0 |
| **Total** | | **1020** | **102.0** |
| **GRAND TOTAL** | | **1,680** | **168.0** |

The total duration of the course is 1,680 hours.

**Entry Requirements**

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

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

**Or**

1. Certificate in Scaffolding Technology Level 4

**Or**

1. Any other qualifications 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

**Field attachment**

An individual enrolled in this course will undergo a field attachment for a period of 360 hours in a construction site with scaffolding works.

**Assessment**

The course will be assessed at two levels:

1. **Internal assessment**: conducted continuously by the trainer (internal assessor) who is monitored by an accredited internal verifier.
2. **External assessment:** conducted by an accredited external assessor who is monitored by an accredited external verifier.

The assessors and verifiers are registered by TVET CDACC which also coordinates external assessment.

**Certification**

An individual will be awarded a Certificate of Competency on demonstration of competence in a unit of competency. To be awarded Certificate in Scaffolding Technology Level 5, an individual must demonstrate competence in all the units of competency in the qualification pack.

These certificates will be awarded by TVET CDACC in conjunction with Kabete National Polytechnic.

# BASIC UNITS OF LEARNING

## COMMUNICATION SKILLS

**UNIT CODE: CON**/CU/ST/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 * Observation |
| 1. Conduct interviews | * Types of interview * Establishing rapport * Facilitating resolution of issues * Developing action plans | * Written * 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 * Observation |
| 1. Represent the organization | * Presentation techniques * Development of a presentation * Multi-media utilization in presentation * Communication skills relevant to client groups | * Observation * Written |

**Suggested Methods of Instruction**

* Role playing
* Viewing of related videos

**Recommended Resources**

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

## DIGITAL LITERACY

**UNIT CODE:** CON/CU/ST/BC/02/5/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 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/ST/BC/03/5/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/ST/BC/04/5/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/ST/BC/05/5/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/ST/BC/06/5/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

## TECHNICAL DRAWING

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

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Apply technical drawing skills

**Duration of Unit:** 120 hours

**Unit Description**

This unit covers the competencies required to apply technical drawing skills. It involves competencies for selecting, using and maintaining drawing equipment and materials. It also involves producing plane geometry drawings, pictorial and orthographic drawings of components and producing assembly drawings.

**Summary of Learning Outcomes**

1. Use and maintain drawing equipment and materials
2. Produce plane geometry drawings
3. Produce pictorial and orthographic drawings of components
4. Produce assembly drawings

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

| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| --- | --- | --- |
| 1. Use and maintain drawing equipment and materials | * 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) | * Observation * Oral questioning * Written tests |
| 1. Produce plane geometry drawings | * Types of lines in drawings * Construction of geometric forms e.g. squares, circles * Construction of different angles * Measurement of different angles * Standard drawing conventions | * Oral questioning * Practical tests * Observation |
| 1. Produce pictorial and orthographic drawings | * Interpretation of sketches and drawings of patterns e.g. cylinders, prisms * Meaning of pictorial and orthographic drawings * Sectioning * Meaning of symbols and abbreviations * Drawing and interpretation of orthographic elevations * Dimensioning of orthographic elevations * Drawing objects in isometric view * Drawing objects in oblique view | * Observation * Practical tests * Oral questioning |
| 1. Produce assembly drawings | * Terms and concepts * Meaning of assembly drawings * Parts list * Assembling of parts | * Observation * Oral questioning * Written tests * Interview * Practical tests |

**Suggested Methods of Instruction**

* Projects
* Demonstration
* Discussions
* Assignments
* Interactive lectures
* Direct instruction

**Recommended Resources**

* Drawing room
* Drawing instruments e.g. T-squares, set squares, drawing sets
* Drawing tables
* Pencils, papers, erasers
* Masking tapes

## ENGINEERING MATHEMATICS

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

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Apply engineering mathematics

**Duration of Unit:** 120 hours

**Unit Description**

This unit describes the competencies required to apply engineering mathematics. It involves applying: algebra, trigonometry, complex numbers, co-ordinate geometry and carrying out binomial expansion. It also entails carrying out mensuration, statistics, vector theory and matrices.

**Summary of Learning Outcomes**

1. Apply Algebra
2. Apply Trigonometry and hyperbolic functions
3. Apply complex numbers
4. Apply Coordinate Geometry
5. Carry out Binomial Expansion
6. Carry out Mensuration
7. Apply Statistics
8. Apply Vector theory
9. Apply Matrix

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Apply Algebra | * Base and Index * Law of indices * Indicial equations * Laws of logarithm * Logarithmic equations * Conversion of bases * Use of calculator * Reduction of equations * Solution of equations reduced to quadratic form * Solutions of simultaneous linear equations in three unknowns * Solutions of problems involving AP and GP | * Written tests * Oral questioning * Assignments * Supervised exercises |
| 1. Apply Trigonometry | * Half -angle formula * Factor formula * Trigonometric functions * Parametric equations * Measures calculation | * Written tests * Oral questioning * Assignments * Supervised exercises |
| 1. Apply complex numbers | * Definition of complex numbers * Stating complex numbers in numbers in terms of conjugate argument and   modulus   * Representation of complex numbers on the Argand diagram | * Assignments * Oral questioning * Supervised exercises * Written tests |
| 1. Apply Coordinate Geometry | * Polar equations * Cartesian equation * Graphs of polar equations * Definition of a point | * Written tests * Oral questioning * Assignments * Supervised exercises |
| 1. Carry out Binomial Expansion | * Definition of binomial expansion * Pascal triangle * Solving binomial equations | * Written tests * Oral questioning * Assignments * Supervised exercises |
| 1. Carry out Mensuration | * Units of measurements * Perimeter and areas of regular figures * Volume of regular solids * Surface area of regular solids | * Written tests * Oral questioning * Assignments * Supervised exercises |
| 1. Apply Statistics | * Measures of central tendency mean, mode and median * Measures of dispersion * Variance and standard deviation * Probability basics | * Assignments * Oral questioning * Supervised exercises * Written tests * Simulation * Data modelling |
| 1. Apply Vector theory | * Vectors and scalar in two and three dimensions * Operations on vectors: Addition and Subtraction * Position vectors * Resolution of vectors | * Assignments * Oral questioning * Supervised exercises * Written tests |
| 1. Apply Matrix methods | * Matrix operation * Determinant of 2x2 matrix * Inverse of 2x2 matrix * Solution of linear simultaneous equations in 2 unknown * Application of matrices | * Assignments * Oral questioning * Supervised exercises * Written tests |

**Suggested Methods of Instruction**

* Direct instruction
* Assignments
* Group discussions
* Demonstration
* Exercises
* Case studies

**Recommended Resources**

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

## APPLICATION OF SCIENTIFIC PRINCIPLES

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

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Apply scientific principles

**Duration of Unit:** 80 Hours

**Unit Description**

This unit describes the competencies required to apply scientific principles in scaffolding. It involves applying science concepts and principles of forces, identifying types of loads on scaffolding systems and properties of scaffolding materials.

**Summary of Learning Outcomes**

1. Apply science concepts
2. Apply principles of forces
3. Identify types of loads in scaffolding
4. Identify properties of scaffolding materials

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Apply science concepts | * Terms and concepts * Units of measurement * Standard International Units * Density and pressure * Work, power and energy * Moments basics * Motion basics | * Written tests * Interview |
| 1. Apply principles of forces | * Terms and concepts * Forces * Theorems of forces * Resolution of forces | * Written tests * Interview |
| 1. Identify types of loads in scaffolding | * Terms and concepts * Types of loads * Determination of loads * Analysis of loads | * Written tests * Interview |
| 1. Identify properties of scaffolding materials | * Terms and concepts * Physical properties of materials * Mechanical properties of materials | * Written tests * Interview |

**Suggested Methods of Instruction**

* Demonstration
* Field trips
* Discussions
* Question and answer
* Direct instruction
* Assignments
* Case studies

**Recommended Resources**

**Tools and equipment**

* Computer
* Charts

**Materials and supplies**

* Computer software
* Construction materials
* Computers
* Stationery
* Manufacturer’s catalogues
* Samples

**Personal protective equipment (PPEs)**

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

## WORKSHOP TECHNOLOGY PRACTICES

**UNIT CODE:** CON/CU/ST/CC/04/5/A

**Relationship to Occupational Standards**

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

**Duration of Unit:** 100 Hours

**Unit Description**

This unit covers the competencies required to perform workshop processes. It involves applying workshop safety practices, using workshop tools and equipment, demonstrating the use of scaffold components and members, preparing scaffold site materials and supplies. It also entails preparation of scaffold site, storage of scaffold materials and supplies, maintaining scaffold components and tools.

**Summary of Learning Outcomes**

1. Apply workshop safety practices
2. Use workshop tools and equipment
3. Demonstrate use of scaffold components and members
4. Prepare scaffold site materials and supplies
5. Prepare scaffold site
6. Store scaffold materials and supplies
7. Maintain scaffold components and tools

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Apply workshop safety practices | * Terms and concepts * Personal Protective Equipment * Scaffolding Tools and equipment * Workshop rules * First Aid | * Written tests * Interview * Observation * Oral questioning |
| 1. Use workshop tools and equipment | * Terms and concepts * workshop tools and equipment   + identification   + use   + care   + maintenance * Calibration of equipment | * Written tests * Interview * Observation * Oral questioning |
| 1. Demonstrate use of scaffold components and members | * Terms and concepts * Scaffold components and members   + identification   + use   + care   + maintenance | * Written tests * Interview * Observation * Oral questioning |
| 1. Prepare scaffold site materials and   supplies | * Terms and concepts * Materials and supplies   + identification   + use | * Written tests * Interview * Observation * Oral questioning |
| 1. Prepare scaffold site | * Terms and concepts * Site surveying * Site is clearance * Site is levelling | * Written tests * Interview * Observation * Oral questioning |
| 1. Store scaffold materials and supplies | * Terms and concepts * Types of storage * Storage systems * Methods of storage * Inspection and sorting of scaffolding components and members * Record keeping | * Written tests * Interview * Observation * Oral questioning |
| 1. Maintain scaffold components and members | * Terms and concepts * Methods of maintenance   + Cleaning   + Welding   + Oiling   + Greasing   + Painting   + Replacement | * Written tests * Interview * Observation * Oral questioning |

**Suggested Methods of Instruction**

* Demonstration
* Field trips
* Discussions
* Question and answer

**Recommended Resources**

**Tools and equipment**

* Shovel
* Plumb bob
* Portable power drill
* Pickle
* Spirit level
* Measuring tape
* Hand drill
* Screw drivers
* circular saw
* pliers
* Safety goggles
* Pliers
* Grinder

**Materials and supplies**

* Grease
* Oil

**Personal protective equipment (PPEs)**

* Helmets
* Gloves
* Safety goggles
* Safety boots
* Overalls
* Dust masks
* Gas masks
* Dust coats

# CORE UNITS OF LEARNING

## BASIC SCAFFOLD SKETCHES

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

**Relationship to Occupational Standards**

This unit addresses the unit of competency: **Develop basic scaffold sketches**

**Duration of Unit:** 120 hours

**Unit Description**

This unit covers the competencies required to develop basic scaffold sketches. It involves interpreting working drawings and developing scaffold working sketches.

**Summary of Learning Outcomes**

1. Interpret working drawings
2. Develop scaffold working sketch

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Interpret working drawings | * Terms and concepts * Types of working drawings * Interpretation of symbols * Interpretation of metric and imperial systems of measurement * Interpretation of measurements | * Observation * Written tests * Oral questioning * Interview * Portfolio * Third party report |
| 1. Develop scaffold working sketch | * Application of symbols in sketching * Application of metric and imperial system   of measurement   * Application of basic measurements * Sketching * Drawing | * Observation * Written tests * Oral questioning * Interview * Portfolio * Third party report |

**Suggested Methods of Instruction**

* Direct instruction
* Demonstrations
* Group discussion
* Presentations
* Videos
* Assignments

**Recommended Resources**

* Computers
* Stationery
* Charts/posters/
* Magazines
* Video clips
* LCD projector
* Training kits
* Drawing kits

## SCHEDULING SCAFFOLD WORKS

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

**Relationship to Occupational Standards**

This unit addresses the unit of competency: develop work schedules

**Duration of Unit:** 120 hours

**Unit Description**

This unit covers the competencies required in developing working schedules. It involves developing time execution schedule, scaffolding members, components, materials and supplies schedule, Develop human resource schedule and tools and equipment schedule.

**Summary of Learning Outcomes**

1. Develop time schedule
2. Develop scaffolding members, components, materials and supplies schedule
3. Develop human resource schedule
4. Develop tools and equipment schedule

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Develop time schedule | * Terms and concepts * Allocation of time to activity * Critical path analysis * PERT | * Observation * Written tests * Oral questioning * Interview |
| 1. Develop scaffolding members, components, materials and supplies schedule | * Terms and concepts * Identification of scaffolding activities * Identification of scaffolding members, components, materials and supplies * Quantifying of scaffolding members, components, materials and supplies | * Observation * Written tests * Oral questioning * Interview |
| 1. Develop human resource schedule | * Terms and concepts * Identifying and quantifying human resource requirement * Selection of human resources * Allocation of human resource to activities | * Observation * Written tests * Oral questioning * Interview |
| 1. Develop tools and equipment schedule. | * Terms and concepts * Identification of scaffolding tools and equipment * Quantifying of scaffolding tools and equipment | * Observation * Written tests * Oral questioning * Interview |

**Suggested Methods of Instruction**

* Direct instruction
* Demonstrations
* Group discussion
* Presentations
* Videos
* Assignments

**Recommended Resources**

* Computers
* Stationery
* Charts/posters/
* Magazines
* Video clips
* LCD projector

## SCAFFOLDS ERECTION AND DISMANTLING

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

**Relationship to Occupational Standards**

This unit addresses the unit of competency: **Erect and dismantle scaffolds**

**Duration of Unit:** 180 hours

**Unit Description**

This unit covers the competencies required to erect and dismantle scaffolds. It involves erecting scaffolds, dismantling scaffolds and maintaining scaffold.

**Summary of Learning Outcomes**

1. Erect scaffold
2. Dismantle scaffold
3. Maintain scaffold components

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Erect scaffold | * Terms and concepts * Site safety * Scaffolding tools and equipment * Scaffold measurements * Surface preparation * Setting up scaffolds * Procedure for assembling of scaffold * Anchorage and fixing points * Scaffold integrity * Maintenance of scaffolds * Managing emerging issues | * Observation * Written tests * Oral questioning * Interview * Portfolio * Third party report |
| 1. Dismantle scaffold | * Terms and concepts * Site safety * Procedure of dismantling * Temporary storage area * Sorting out and storage * Maintaining and servicing of components and members * Transportation * Final storage | * Observation * Written tests * Oral questioning * Interview * Portfolio * Third party report |
| 1. Maintain scaffold components | * Terms and concepts * Scaffold modification * Methods of maintaining scaffolds   + Painting   + Cleaning   + Oiling   + Replacing | * Observation * Written tests * Oral questioning * Interview * Portfolio * Third party report |

**Suggested Methods of Instruction**

* Direct instruction
* Demonstrations
* Group discussion
* Presentations
* Videos
* Assignments

**Recommended Resources**

* Computers
* Stationery
* Charts/posters/
* Magazines
* Video clips
* LCD projector
* PPEs
* Members and components
* Material and supplies
* Tools and equipment
* Manuals
* Portable electrical equipment
* Electrical and Optical instruments

## *SCAFFOLDS INTEGRITY*

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

**Relationship to Occupational Standards**

This unit addresses the unit of competency: **Evaluate scaffolds integrity**

**Duration of Unit:** 120 hours

**Unit Description**

This unit covers the competencies required to evaluate scaffolds integrity. It involves preparing scaffold evaluation protocols, evaluating erected scaffolds and preparing scaffold integrity report.

**Summary of Learning Outcomes**

1. Prepare for scaffold evaluation
2. Evaluate erected scaffolds integrity
3. Prepare scaffold integrity report

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | Content | **Suggested Assessment Methods** |
| 1. Prepare for scaffold integrity evaluation | * Terms and concepts * Integrity evaluation parameters * Evaluation tools and equipment * Development of integrity evaluation checklist | * Observation * Written tests * Oral questioning * Interview * Third party report |
| 1. Evaluate erected scaffolds integrity | * Integrity aspects:   + Plumpness   + Levelness   + Stability   + Anchorage and fixing points   + Assembly   + Accessibility   + Positioning   + Bracing   + Safety | * Observation * Written tests * Oral questioning * Interview * Third party report |
| 1. Prepare scaffold integrity report | * Significance of integrity report * Components of an integrity report * Preparation scaffold integrity report | * Observation * Written tests * Oral questioning * Interview * Third party report |

**Suggested Methods of Instruction**

* Direct instruction
* Demonstrations
* Group discussion
* Presentations
* Videos
* Assignments

**Recommended Resources**

* Computers
* Internet connectivity
* Stationery
* Charts/posters/
* Magazines
* Video clips
* LCD projector
* PPEs
* Members and components
* Material and supplies
* Tools and equipment
* Manuals

## SAFETY COMPLIANCE

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

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Oversee safety compliance

**Duration of Unit:** 120 hours

**Unit Description**

This unit covers the competencies required to oversee safety compliance. It involves assessing safety hazards, conducting safety talks, drills and Preparing safety briefs. **Summary of Learning Outcomes**

1. Assess safety hazards
2. Conduct safety talks
3. Conduct safety drills
4. Prepare safety briefs

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Assess safety hazards | * Terms and concept * Personal and general safety * Safety resources   + Safety team   + PPEs   + Materials and supplies * Accidents and hazards * Site safety plan * Emergency procedure * Mitigation measures * Safety signage | * Observation * Written tests * Oral questioning * Interview * Third party report |
| 1. Conduct safety talks | * Terms and concept * Site rules and regulations * Safety codes * First aid procedures * Safety incidents * Safety hazards:   + Types of hazards   + Causes of hazards * General safety * Safety compliance checks | * Observation * Written tests * Oral questioning * Interview * Third party report |
| 1. Conduct safety drills | * Terms and concepts * Safety training * First aid practice * PPE’s * Conducting safety drills | * Observation * Written tests * Oral questioning * Interview * Third party report |
| 1. Disseminate safety briefs | * Maintaining safety records * Components of a safety report * Preparation of a safety report * Dissemination of safety reports * Follow up on safety issues | * Observation * Written tests * Oral questioning * Interview * Third party report |

**Suggested Methods of Instruction**

* Direct instruction
* Demonstrations
* Group discussion
* Presentations
* Videos
* Assignments
* Role play
* Case studies

**Recommended Resources**

* Computers
* Internet connectivity
* Stationery
* Charts/posters/
* Magazines
* Video clips
* LCD projector
* PPEs
* Members and components
* Tools and equipment
* Manuals