****

**REPUBLIC OF KENYA**

**COMPETENCY BASED CURRICULUM**

**FOR**

 **SPINNING**

**LEVEL 5**



TVET CDACC

P.O. BOX 15745-00100

NAIROBI

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# FOREWORD

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

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

These reforms demand that Industry takes a leading role in curriculum development to ensure the curriculum addresses its competence needs. It is against this background that this Curriculum has been developed.

It is my conviction that this curriculum will play a great role towards development of competent human resource for the Textile sector’s growth and sustainable development

**PRINCIPAL SECRETARY,**

**VOCATIONAL AND TECHNICAL TRAINING**

**MINISTRY OF EDUCATION**

# PREFACE

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

The Technical and Vocational Education and Training Act No. 29 of 2013 on Reforming Education and Training in Kenya, emphasized the need toreform 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 Textile Sector Skills Advisory Committee (SSAC) and other stakeholders have developed this curriculum.

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

The curriculum is designed and organized with an outline of learning outcomes; suggested delivery methods, 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, Textile SSAC, 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 organizations.

I appreciate Textile Sector Skills Advisory Committee (SSAC) who enabled the development of this curriculum.

I recognize with appreciation the role of the SSAC in ensuring that competencies required by the industry are addressed in this curriculum. I also thank all stakeholders in the Textile 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 Textile sector will acquire competencies that will enable them to perform their work more efficiently.

**COUNCIL SECRETARY/CEO**

**TVET CDACC**

# ABBREVIATION AND ACRONYMS

BC Basic Competency

CC Common Competency

CDACC Curriculum Development, Assessment and Certification Council

CPU Control Powering Unit

CR Core Competency

ENG Engineering

GPS Global positioning system

ICT Information and Communication Technology

IT Information Technology

KCSE Kenya Certificate of Secondary Education

OBD On-board diagnostics

OS Occupational Standards

OSHA Occupational Health and Safety Act

PPE Personal protective equipment

SOP Standard Operating Procedures

SPG Spinning

TEX Textile

TQM Total Quality Management

TVET Technical and Vocational Education and Training

# **KEY TO UNIT CODE**

 **ENG/CU/SPG/BC /01/ 5/ A**

Industry or sector

Occupational Standards

Occupational area

Type of competency

Competency number

Competency level

Control Version

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# COURSE OVERVIEW

The Spinning Level 5 consists of competencies that a person must achieve to enable him/her to work in a spinning department. It entails testing textile spinning materials, performing spinning preparatory operations, carding operations, breaker drawing operations, combing operations, finisher drawing operations, simplex operations, ring spinning operations and cone winding

|  |
| --- |
| **BASIC UNITS OF COMPETENCY** |
| **Unit of Learning Code**  | **Units of Learning Title**  | **Duration in Hours**  | **Credits Factors** |
| **ENG/CU/SPG/BC/01/5/A** | Communication skills | 25 | 2.5 |
| **ENG/CU/SPG/BC/02/5/A** | Digital literacy | 45 | 4.5 |
| **ENG/CU/SPG/BC/03/5/A** | Entrepreneurial skills | 70 | 7.0 |
| **ENG/CU/SPG/BC/04/5/A** | Employability skills | 50 | 5.0 |
| **ENG/CU/SPG/BC/05/5/A** | Environmental literacy | 25 | 2.5 |
| **ENG/CU/SPG/BC/06/5/A** | Occupational health and safety | 25 | 2.5 |
| **TOTAL** | **240** | **24.0** |
| **COMMON UNITS OF COMPETENCY** |
| **ENG/CU/SPG/CC/01/5/A** | Technical drawing | 75 | 7.5 |
| **ENG/CU/SPG/CC/02/5/A** | Engineering mathematics | 75 | 7.5 |
| **ENG/CU/SPG/CC/03/5/A** | Mechanical science principles | 50 | 5.0 |
| **ENG/CU/SPG/CC/04/5/A** | Machine maintenance and safety procedures  | 80 | 8.0 |
| **ENG/CU/SPG/CC/05/5/A** | Management of spinning wastes  | 50 | 5.0 |
| **TOTAL** | **330** | **33.0** |
| **CORE UNITS OF COMPETENCY** |
| **ENG/CU/SPG/CR/01/5/A** | Test textile spinning materials  | 60 | 6.0 |
| **ENG/CU/SPG/CR/02/5/A** | Perform spinning preparatory operations | 70 | 7.0 |
| **ENG/CU/SPG/CR/03/5/A** | Perform carding operations | 40 | 4.0 |
| **ENG/CU/SPG/CR/04/5/A** | Perform breaker drawing operations | 45 | 4.5 |
| **ENG/CU/SPG/CR/05/5/A** | Perform combing operations | 50 | 5.0 |
| **ENG/CU/SPG/CR/06/5/A** | Perform finisher drawing operations | 45 | 4.5 |
| **ENG/CU/SPG/CR/07/5/A** | Perform simplex operations | 60 | 6.0 |
| **ENG/CU/SPG/CR/08/5/A** | Perform ring spinning operations | 70 | 7.0 |
| **ENG/CU/SPG/CR/09/5/A** | Perform cone winding | 40 | 4.0 |
| **ENG/CU/SPG/CR/10/5/A** | Doubling and twisting operations  | 60 | 6.0 |
|  | Industrial attachment | 360 | 36.0 |
| **TOTAL**  | **900** | **90.0** |
| **GRAND TOTAL** | **1470** | **147.0** |

 **Entry Requirements**

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

1. Kenya Certificate of Secondary Education (K.C.S.E.) with a minimum mean grade of D (plain)

**Or**

1. Artisan certificate Level 4 in a related course with **one** year of continuous work experience

**Or**

1. Equivalent 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.

**Assessment**

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

**Certification**

A candidate will be issued with a record of Achievement on demonstration of competence in a unit of competency. To attain the qualification national certificate in Spinning Craft, the candidate must demonstrate competence in all the units of competency as given in qualification pack. TVET CDACC will issue these certificates in conjunction with training provider.

# BASIC UNITS OF LEARNING

##

# COMMUNICATION SKILLS

**UNIT CODE:** ENG/CU/SPG/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:** ENG/CU/SPG/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:** ENG/CU/SPG/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:** ENG/CU/SPG/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
 | 1. Self-awareness
2. Formulating personal vision, mission and goals
3. Strategies for overcoming life challenges
4. Emotional intelligence
5. Assertiveness versus aggressiveness
6. Expressing personal thoughts, feelings and beliefs
7. Developing and maintaining high self-esteem
8. Developing and maintaining positive self-image
9. Articulating ideas and aspirations
10. Accountability and responsibility
11. Good work habits
12. Self-awareness
13. Self-development
14. Financial literacy
15. Healthy lifestyle practices
 | 1. Written tests
2. Oral questioning
3. Interviewing
4. Portfolio of evidence
5. Third party report
 |
| 1. Demonstrate interpersonal communication
 | 1. Meaning of interpersonal communication
2. Listening skills
3. Types of audience
4. Writing skills
5. Reading skills
6. Meaning of empathy
7. Understanding customers’ needs
8. Establishing communication networks
9. Sharing information
 | 1. Written tests
2. Oral questioning
3. Interviewing
4. Portfolio of evidence
5. Third party report
 |
| 1. Demonstrate critical safe work habits
 | 1. Stress and stress management
2. Punctuality and time consciousness
3. Leisure
4. Integratingpersonal objectives into organizational objectives
5. Resources utilization
6. Setting work priorities
7. HIV and AIDS
8. Drug and substance abuse
9. Handling emerging issues
 | 1. Written tests
2. Oral questioning
3. Interviewing
4. Portfolio of evidence
5. Third party report
 |
| 1. Lead a small team
 | 1. Leadership qualities
2. Team building
3. Determination of team roles and objectives
4. Team performance indicators
5. Responsibilities in a team
6. Forms of communication
7. Complementing team activities
8. Gender and gender mainstreaming
9. Human rights
10. Maintaining relationships
11. Conflicts and conflict resolution
 | 1. Written tests
2. Oral questioning
3. Interviewing
4. Portfolio of evidence
5. Third party report
 |
| 1. Plan and organize work
 | 1. Functions of management
* Planning
* Organizing
1. Time management
2. Decision making process
3. Task allocation
4. Evaluating work activities
5. Resource utilization
6. Problem solving
7. Collecting and organising information
 | 1. Written tests
2. Oral questioning
3. Interviewing
4. Portfolio of evidence
5. Third party report
 |
| 1. Maintain professional growth and development
 | 1. Opportunities for professional growth
2. Assessing training needs
3. Licenses and certifications for professional growth and development
4. Pursuing personal and organizational goals
5. Identifying work priorities
6. Recognizing career advancement
 | 1. Written tests
2. Oral questioning
3. Interviewing
4. Portfolio of evidence
5. Third party report
 |
| 1. Demonstrate workplace learning
 | 1. Managing own learning
2. Contributing to the learning community at the workplace
3. Cultural aspects of work
4. Variety of learning context
5. Application of learning
6. Safe use of technology
7. Identifying opportunities
8. Generating new ideas
9. Workplace innovation
10. Performance improvement
11. Handling emerging issues
12. Future trends and concerns in learning
 | 1. Written tests
2. Oral questioning
3. Interviewing
4. Portfolio of evidence
5. Third party report
 |
| 1. Demonstrate problem solving skills
 | 1. Problem identification
2. Problem solving
3. Application of problem-solving strategies
4. Resolving customer concerns
 | 1. Written tests
2. Oral questioning
3. Interviewing
4. Portfolio of evidence
5. Third party report
 |
| 1. Demonstrate workplace ethics
 | 1. Meaning of ethics
2. Ethical perspectives
3. Principles of ethics
4. Values and beliefs
5. Ethical standards
6. Organization code of ethics
7. Common ethical dilemmas
8. Organization culture
9. Corruption, bribery and conflict of interest
10. Privacy and data protection
11. Diversity, harassment and mutual respect
12. Financial responsibility/accountability
13. Etiquette
14. Personal and professional integrity
15. Commitment to jurisdictional laws
16. Emerging issues in ethics
 | 1. Written tests
2. Oral questioning
3. Interviewing
4. Portfolio of evidence
5. Third party report
 |

**Suggested Methods of Instruction**

1. Demonstrations
2. Simulation/Role play
3. Discussion
4. Presentations
5. Case studies
6. Q&A

**Recommended Resources**

1. Computers
2. Stationery
3. Charts
4. Video clips
5. Audio tapes
6. Radio sets
7. TV sets
8. LCD projectors

# ENVIRONMENTAL LITERACY

**UNIT CODE:** ENG/CU/SPG/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:** ENG/CU/SPG/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:** ENG/CU/SPG/CC/01/5/A

**Relationship to Occupational Standards**

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

**Duration of Unit:** 75 Hours

**Unit Description**

This unit covers the competencies required to prepare and interpret technical drawings by a Spinning craft person. It involves competencies to select, use and maintain drawing equipment and materials. It also involves producing plain geometry drawings, solid geometry drawings, pictorial and orthographic drawings of components and application of CAD software.

**Summary of Learning Outcomes**

1. Use and maintain drawing equipment and materials
2. Produce plain geometry drawings
3. Produce solid geometry drawings
4. Produce pictorial and orthographic drawings of components
5. Apply CAD software
* **Learning** Outcomes**, Content and Suggested Assessment Methods:**

| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| --- | --- | --- |
| 1. Use and maintain drawing equipment and materials
 | * Identification and maintain of drawing equipment and materials
* Identification and maintain of drawing materials
 | * Observation
* Oral questioning
* Written tests
 |
| 1. Produce plain geometry drawings
 | * Lettering in drawing
* Types of lines in drawings
* Construction of geometric forms
* Construction of different angles
* Measurement of different angles
* Standard drawing conventions
 | * Oral questioning
* Written tests
* Observation
 |
| 1. Produce solid geometry drawings
 | * Interpretation of sketches and drawings of patterns
	+ Cylinders
	+ Prisms
	+ Pyramids
* Development of surface of interpenetrating solids and truncated solids
* Interpenetrations of solids
	+ Cylinder to cylinder,
	+ Cylinder to prism,
	+ Prism to prism of equal and unequal diameters
 | * Observation
* Written tests
* Oral questioning
 |
| 1. Produce pictorial and orthographic drawings of components
 | * Meaning of pictorial and orthographic drawings and sectioning
* Meaning of symbols and abbreviations
* Drawing of isometric, oblique, axonometric, auxiliary and perspective views
* Drawing of first and third angle projections
* Sectioning of components
* Free hand sketching of tools, equipment, components, geometric forms and diagrams
 | * Observation
* Written test
* Oral test
 |
| 1. Produce assembly drawings
 | * Explosion of orthographic views
* Explosion of pictorial views
* Identification and listing of parts
* Production of sectional views
* Hatching of drawings
 | * Observation
* Written test
* Oral test
 |
| 1. Apply CAD software in drawing
 | * Meaning and types of CAD e.g.
* Auto CAD
* Archi CAD
* Solid works
* Inventor
* Circuit maker
* Electronic work bench
* 2D and 3Ddrafting technique
* Annotation of models
 | * Practicals
* Observation
* Written tests
 |

**Suggested Methods of Instruction**

* Projects
* Demonstration
* Practice by the trainee
* Field trips
* Group discussions
* Direct instructions

**Recommended Resources**

* + Drawing room
	+ Computer lab
	+ Drawing equipment and materials
	+ Computers
	+ CAD package
	+ Overhead projector

## ENGINEERING MATHEMATICS

**UNIT CODE:** ENG/CU/SPG/CC/02/5/A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: **Apply engineering mathematics**

Duration of Unit: 75 hours

**Unit Description**

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

**Summary of Learning Outcomes**

1. Use concepts of arithmetic in solving work problems
2. Use common formula and algebraic expressions for work
3. Use trigonometry to solve practicals engineering problems
4. Perform estimations, measurements and calculations
5. Apply matrices in work
6. Apply vectors in work
7. Collect, organize and interpret statistical data
8. Apply concepts of probability for work
9. Perform commercial calculations

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

|  |  |  |
| --- | --- | --- |
| Learning Outcome | Content | Suggested Assessment Methods |
| 1. Use concepts of arithmetic in solving work problems
 | * Fundamental operations
* Addition,
* Subtraction,
* Multiplication,
* Division of positive and negative numbers
* Fractions and decimals operations and conversions
* Indices
* Ratios and proportions
* Meaning
* Conversions into percentages
* Direct and inverse proportions determination
* Use of scientific calculator
 | * Written tests
* Oral questioning
* Assignments
* Supervised exercises
 |
| 1. Use formulae and algebraic expressions for work
 | * Algebraic linear equations
* Simultaneous
* Quadratic
* Linear graphs
* Plotting
* Interpretation
* Applications of linear graphs
* Curves of first and second degree
* Plotting
* Interpretation
* Applications
 | * Written tests
* Oral questioning
* Assignments
* Supervised exercises
 |
| 1. Use trigonometry to solve practicals work problems
 | * Meaning of trigonometry
* Pythagoras theorem
* Trigonometry ratios of angles
* Trigonometric identities
* Conversion of angles
 | * Assignments
* Oral questioning
* Supervised exercises
* Written tests
 |
| 1. Perform estimations, measurements and calculations of quantities
 | * Units of measurements and their symbols
* Conversion of units of measurement
* Calculation of length, width, height, perimeter, area and angles of figures
* Measuring tools and equipment
* Performing measurements and estimations of quantities
 | * Assignments
* Oral questioning
* Practicals tests
* Observation
* Supervised exercises
* Written tests
 |
| 1. Apply matrices in work
 | * Meaning of matrix
* Types of matrices
* Matrix operations
* Compatibility
* Addition
* Subtraction
* Multiplication
* Determination of inverse of a matrix
* Solution of simultaneous equations with two and three unknowns
* Applications of matrices
 | * Assignments
* Supervised exercises
* Written tests
 |
| 1. Collect, organize and interpret statistical data
 | * Classification of data
* Grouped data
* Ungrouped data
* Data collection
* Importance of sampling
* Errors in sampling
* Types of sampling and their limitations
* Tabulation of data
* Class intervals
* Class boundaries
* Frequency tables
* Cumulative frequency
* Diagrammatic and graphical presentation of data e.g.
* Histograms
* Frequency polygons
* Bar charts
* Pie charts
* Cumulative frequency curves
* Meaning of measures of central tendency
* Measures
* Properties
* Calculation and interpretation of mean, mode and median
* Variance and standard deviation
 | * Assignments
* Oral questioning
* Supervised exercises
* Written tests
 |
| 1. Apply vectors in work
 | * Meaning of vector
* Representations of vectors
* Operations of vectors
* Addition
* Subtraction
* Scalar and vector products
* Determination of angles
 | * Assignments
* Supervised exercises
* Written tests
 |
| 1. Apply concepts of probability in work
 | * Meaning of probability
* Types of probability events
* Dependent
* Independent
* Mutually exclusive
* Laws of probability
* Counting techniques
* Permutation
* Combination
* Tree diagrams
* Ven diagrams
 | * Written tests
* Assignments
* Supervised exercises
 |
| 1. Perform commercial calculations
 | * Product pricing
* Average sales determination
* Stock turnover
* Calculation of incomes
* Profit and loss calculations
* Salaries
* Gross
* Net
* Wages
* Time rate
* Flat rate
* Overtime
* Piece rate
* Commission
* Percentage
* Bonus
* Conversion of one currency to another
* Exchange rates calculation
* Devaluation
* Revaluation
 | * Oral questioning
* Written tests
* 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
* Computers with internet connection

## MECHANICAL SCIENCE PRINCIPLES

**UNIT CODE:** ENG/CU/SPG/CC/03/5/A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: **Apply Mechanical science principles**

**Duration of Unit:** 50 hours

**Unit Description**

This unit describes the competencies required by a spinning craft person in order to apply a wide range of Mechanical science principles in their work. It includes using concepts of mechanical science, determining effects of loading on static and dynamic engineering systems, analyse properties of materials, determine parameters of a fluid system and use of basic systems in power transfer.

**Summary of Learning Outcomes**

1. Use the concept of mechanical science
2. Determine effects of loading in static and dynamic engineering systems
3. Analyse properties of materials
4. Determine parameters of a fluid system
5. Use of basic mechanical systems in power transfer

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Use the concept of mechanical science
 | * Define work, force, mechanical advantage and efficiency
* State and explain newton’s laws of motion
* Calculation velocity, distance, and acceleration
* Conversion and SI units of energy, power and work
 | * Written tests
* Oral questioning
* Assignments
* Supervised exercises
 |
| 1. Determine effects of loading in static and dynamic engineering systems
 | * Explain type of forces
* Discussion and analysis of reaction of forces
* Calculation of coefficient of friction and inclined plane
* Resolve the forces
* Calculate the resultant force and equilibrium
* Discuss the application of different forces
* Calculation of moments of a force,
 | * Written tests
* Oral questioning
* Assignments
* Supervised exercises
 |
| 1. Analyse properties of materials
 | * Definition of mechanical properties of materials
* Draw the stress strain graph
* Discuss application of material depending on their properties
* Discuss effect of environmental factors on material properties.
 | * Assignments
* Oral questioning
* Supervised exercises
* Written tests
 |
| 1. Determine parameters of a fluid system
 | * Discussion of Pascal’s principles
* Measuring fluid parameters
* State the laws of gases
* Discuss properties of water and steam
 | * Assignments
* Oral questioning
* Practicals tests
* Observation
* Supervised exercises
* Written tests
 |
| 1. Use of basic mechanical systems in power transfer
 | * Uses and working principle of Gear trains
* Uses and working principles of Pulley system, hoists and lifts
* Uses and working principles of screws
 | * Assignments
* Supervised exercises
* Written tests
* Practicals test
 |

**Suggested Methods of Instruction**

* Group discussions
* Demonstration by trainer
* Online video clips
* Power point presentation
* Exercises by trainee

**Recommended Resources**

* Scientific Calculators
* Relevant reference materials
* Stationeries
* Electrical workshop
* Relevant practical’s materials
* Dice
* Computers with internet connection

## MACHINE MAINTENANCE AND SAFETY PROCEDURES

**UNIT CODE**: ENG/CU/SPG/CC/04/5/A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: **Perform simple machine maintenance and safety procedures**

**Duration of Unit**: 80 hours

**Unit Description**

This unit describes the competencies required by a spinning craft charge hand to perform simple machine maintenance and safety procedures. It involves preparing cleaning tools, equipment and reagents, carrying out cleaning of spinning machines, lubricating spinning machines, carrying out simple machines setting and documenting maintenance procedures.

**Summary of Learning Outcomes**

1. Prepare cleaning tools, equipment and reagents
2. Carry out cleaning of spinning machines
3. Lubricate spinning machines
4. Carry out simple machines setting
5. Document maintenance procedures

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Prepare cleaning tools, equipment and reagents
 | * Safety precautions
* Protective gears
* Cleaning tools, equipment and reagents
* Cleaning machines
* Maintenance schedules/plan
* Cleaning tools, equipment and reagents
 | * Written tests
* Oral
* Assignments
* Practicals
* Project
 |
| 1. Carry out cleaning of spinning machines
 | * Safety precautions
* Cleaning procedures and requirements
* Protective gears
* Identification of machine parts
* Cleaning of machine parts
* Dirt removal
* Disposal of dirt
 | * Written tests
* Oral
* Assignments
* Practicals
* Project
 |
| 1. Lubricate spinning machines
 | * Safety precautions
* Protective gears
* Identification of moveable machine parts
* Lubricants
* Lubrication of machine parts
 | * Written tests
* Oral
* Assignments
* Practicals
* Project
 |
| 1. Carry out simple machines setting
 | * Machine setting tools and equipment
* Identification of machine settings points
* settings of the machines
* Test-running of the machine
 | * Written tests
* Oral
* Assignments
* Practicals
* Project
 |
| 1. Document maintenance procedures
 | * Documentation tools
* Documentation of maintenance works
* Generation of maintenance reports
* Storage of maintenance reports
 | * Written tests
* Oral
* Assignments
* Practicals
* Project
 |

**Suggested Methods of Instruction**

* Group discussions
* Demonstration by trainer
* Online video clips
* Power point presentation
* Exercises by trainee

**Recommended Resources**

* Scientific Calculators
* Relevant reference materials
* Stationeries
* Spinning workshop
* Mechanical workshop
* Relevant practical materials
* Safety gear
* Computers with internet connection

## MANAGEMENT OF SPINNING WASTES

**UNIT CODE:** ENG/CU/SPG/CC/05/5/A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: **Manage spinning wastes**

**Duration of Unit:** 50 hours

**Unit Description**

This unit describes the competencies required by a spinning craft person to manage spinning wastes. It involves classifying spinning wastes, determining usage and disposal for wastes, processing spinning wastes and documenting spinning wastes

**Summary of Learning Outcomes**

1. Classify spinning wastes
2. Determine usage and disposal for wastes
3. Process spinning wastes
4. Document spinning wastes

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Classify spinning wastes
 | * + Identification of Spinning wastes
	+ Sorting of spinning wastes
	+ Grading of spinning wastes
	+ Storage of spinning of wastes
 | * + Written tests
	+ Oral
	+ Assignments
	+ Practicals
	+ Project
 |
| 1. Determine usage and disposal for wastes
 | * + Spinning of wastes
	+ Analysis of spinning wastes
	+ Segregation of spinning wastes
	+ Usage of spinning waste
	+ Spinning waste disposable
 | * + Written tests
	+ Oral
	+ Assignments
	+ Practicals
	+ Project
 |
| 1. Process spinning wastes
 | * + Safety precautions
	+ Processing quality parameters
	+ Application of waste
	+ Mixing and blending of wastes
	+ Processing of spinning waste
 | * + Written tests
	+ Oral
	+ Assignments
	+ Practicals
	+ Project
 |
| 1. Document spinning wastes
 | * + Documentation tools, materials and equipment
	+ Generation of spinning waste report
	+ Maintenance of spinning waste records
 | * + Written tests
	+ Oral
	+ Assignments
	+ Practicals
	+ Project
 |

**Suggested Delivery Methods**

* Group discussions
* Demonstration by trainer
* Online video clips
* Power point presentation
* Exercises by trainee
* Practicals

**Recommended Resources**

* Spinning wastes
* Protective gear
* Scientific Calculators
* Relevant reference materials
* Stationeries
* Spinning workshop
* Relevant practical materials
* Computers with internet connection

# CORE UNITS OF LEARNING

## TEXTILE SPINNING MATERIALS TESTING

**UNIT CODE:** ENG/CU/SPG/CR/01/5/A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: **Test textile spinning materials**

**Duration of Unit:** 60 hours

**Unit description**

This unit describes the competencies required by a spinning craft person to test textile-spinning materials. It involves competencies required to identify textile spinning material, set up textile testing equipment, test textile spinning material, document textile testing results and interpret textile test results.

**Summary of Learning Outcomes**

1. Identify textile fibre spinning material
2. Set up textile testing equipment
3. Test textile spinning material (Sliver and roving)
4. Document textile testing results
5. Interpret textile test results.

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Identify textile fibre spinning material
 | * Sources of textile fibres
* Textile fibres classification
* Textile fibre properties
* Fibre testing equipment
* Fibre sampling methods
* Fibre testing
* Textile fibre reference standards
* Documentation of testing results
 | * Practicals
* Observation
* Written tests
* Oral
 |
| 1. Set up textile yarn testing equipment
 | * Safety operations
* Textile yarn testing equipment
* Yarn testing equipment operation
* Textile yarn properties
 | * Observation
* Written tests
* Oral
* Practicals
 |
| 1. Test textile spinning material (Sliver and roving)
 | * Safety operations
* Equipment operation
* Testing conditions
* Textile spinning material properties
* Textile spinning material defects classification
 | * Practicals
* Oral
* Observation
* Written tests
 |
| 1. Document textile testing results
 | * Documentation tools and equipment
* Technical report writing
* Textile test reference standards
* Documentation of testing results
* Filing and data storage of test results
 | * Practicals
* Oral
* Observation
* Written tests
 |
| 1. Interpret textile test results
 | * Technical report writing
* Textile test reference standards
* Data analysis and comparison
 | * Practicals
* Oral
* Observation
* Written tests
 |

**Suggested Methods of Instruction**

* Presentations and practical demonstrations by trainer;
* Guided learner activities and research to develop underpinning knowledge;
* Supervised activities and projects in a workshop/textile testing laboratory;
* Visiting lecturer/trainer from textile spinning sector;
* Industrial visits.

**Recommended Resources**

1. Textile testing machines and equipment
	* Evenness tester
	* Finesse tester
	* Tensile tester
	* Abrasion tester
	* Light fastness tester
	* Perspiration tester
	* Microscope
	* Wash fastness
	* Moisture meter
	* Crease recovery
	* Bending length
	* Pressley index
	* Twist counter
	* Trash analyser
	* Gravity tester
	* Viscometer
	* Spectrophotometer
	* Weighing balance
	* Flame tester
	* Comb sorter
	* Fibrogragh
2. Consumables
	* Acids
	* Alkalis
	* Solvents
3. Textile materials
	* Fibre
	* Lap
	* Sliver
	* Roving
	* Yarn
4. Tools
	* Black board
	* Callipers
	* Ruler

## SPINNING PREPARATORY OPERATIONS

**UNIT CODE:** ENG/CU/SPG/CR/02/5/A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: **Perform spinning preparatory operations**

**Duration of Unit:** 70 hours

**Unit Description**

This unit describes the competencies required by a spinning craft person to perform spinning preparatory operations. It involves competencies required to open textile bales, mix textile fibres, clean textile fibres, operate blow room machinery, monitor blow room operation and document blow room production

**Summary of Learning Outcomes**

1. Open textile bales
2. Clean textile fibres
3. Mix textile fibres
4. Operate blow room machinery
5. Monitor blow room operation
6. Document blow room production

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Open and clean textile bales
 | * Safety precautions
* Fibre characteristics
* Machinery, tools and equipment
* Methods of opening
* Textile fibre cleaning mechanism
* Fibre trash content
* Waste removal and classification
 | * Oral questions
* Written tests
* Observation
* Practicals
 |
| 1. Mix/blend textile fibres
 | * Safety precautions in fibre blending/mixing
* Methods of blending
* Quality control in fibre blending/mixing
* Mixing/blending ratios and calculations
 | * Oral questions
* Written tests
* Observation
* Practicals
 |
| 1. Operate blow room machinery
 | * Safety precautions
* Machinery operation manuals
* Blow room machines
* Machine maintenance
* Housekeeping
 | * Oral questions
* Written tests
* Observation
* Practicals
 |
| 1. Monitor blow room operation
 | * Blow room calculations
* Blow room quality control
* Blow room process flow
* Blow room machinery monitoring points
 | * Oral questions
* Written tests
* Observation
* Practicals
 |
| 1. Document blow room production
 | * Documentation tools and equipment
* Technical report writing
* Filing and data storage
 | * Oral questions
* Written tests
* Observation
* Practicals
 |

**Suggested Methods of Instruction**

* Presentations and practical
* Demonstrations by trainer;
* Guided learner activities and research to develop underpinning knowledge;
* Supervised activities and projects in a workshop;
* Visiting lecturer/trainer from textile spinning sector;
* Industrial visits.

**Recommended Resources**

* Fibres
* Material handling equipment’s
* Bale opener or Bale plucker
* Fibre cleaning machines
* Open fibre delivery systems
* Lap former
* Machine maintenance tools

## CARDING OPERATIONS

**UNIT CODE:** ENG/CU/SPG/CR/03/5/A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: **Perform carding operations**

**Duration of Unit:** 40 hours

**Unit Description**

This unit describes the competencies required by a spinning craft person to perform carding operations. It involves competencies required to examine carding input material, set up carding machine, operate carding machine, and monitor carding process and document carding production.

**Summary of Learning Outcomes**

1. Examine carding input material
2. Set up carding machine
3. Operate carding machine
4. Monitor carding process
5. Document carding production

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Examine carding input material
 | * Carding input material
* Carding input characteristics
* Reference standards
 | * Oral questions
* Written tests
* Observation
* Practicals
 |
| 1. Set up carding machine
 | * Safety precautions
* Carding machines
* Carding machine setting points
* Carding machine setting tools and equipment
 | * Oral questions
* Written tests
* Observation
* Practicals
 |
| 1. Operate carding machine
 | * Safety precautions
* Machinery operation manuals
* Carding machines
* Machine maintenance
* Housekeeping
 | * Oral questions
* Written tests
* Observation
* Practicals
 |
| 1. Monitor carding process
 | * Carding calculations
* Carding quality control
* Carding process flow
* Carding monitoring points
 | * Oral questions
* Written tests
* Observation
* Practicals
 |
| 1. Document carding production
 | * Documentation tools and equipment
* Technical report writing
* Filing and data storage
 | * Oral questions
* Written tests
* Observation
* Practicals
 |

**Suggested Methods of Instruction**

* Presentations and practical
* Demonstrations by trainer;
* Guided learner activities and research to develop underpinning knowledge;
* Supervised activities and projects in a workshop;
* Visiting lecturer/trainer from textile spinning sector;
* Industrial visits.

**Recommended Resources**

* Fibres
* Material handling equipment’s
* Carding machines
* Machine maintenance tools
* Carding machine setting tools and equipment
* Machine consumables
* Quality control laboratory
* Documentation tools and equipment
* Cans
* Waste bins

## DRAWING OPERATIONS

**UNIT CODE:** ENG/CU/SPG/CR/04/5/A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: **Perform breaker-drawing operations**

**Duration of Unit:** 45 hours

**Unit Description**

This unit describes the competencies required by a spinning craft person perform breaker drawing operations. It involves competencies required feed carded sliver, set up breaker draw frame, operate breaker draw frame, monitor breaker drawing process and document breaker drawing production.

**Summary of Learning Outcomes**

1. Feed carded sliver
2. Set up draw frame
3. Operate draw frame
4. Monitor drawing process
5. Document drawing production.

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Feed carded sliver
 | * Breaker draw frame input material
* Breaker draw frame input material characteristics
* Reference standards
 | * Oral questions
* Written tests
* Observation
* Practicals
 |
| 1. Set up draw frame
 | * Safety precautions
* Breaker draw frame machines
* Breaker draw frame setting points
* Breaker draw frame setting tools and equipment
 | * Oral questions
* Written tests
* Observation
* Practicals
 |
| 1. Operate draw frame
 | * Safety precautions
* Machinery operation manuals
* Breaker draw frame machines
* Breaker draw frame machine maintenance
* Housekeeping
 | * Oral questions
* Written tests
* Observation
* Practicals
 |
| 1. Monitor drawing process
 | * Breaker drawing calculations
* Breaker drawing quality control
* Breaker drawing process flow
* Breaker drawing monitoring points
 | * Oral questions
* Written tests
* Observation
* Practicals
 |
| 1. Document drawing production.
 | * Documentation tools and equipment
* Technical report writing
* Filing and data storage
 | * Oral questions
* Written tests
* Observation
* Practicals
 |

**Suggested Methods of Instruction**

* Presentations and practical
* Demonstrations by trainer;
* Guided learner activities and research to develop underpinning knowledge;
* Supervised activities and projects in a workshop;
* Visiting lecturer/trainer from textile spinning sector Industrial visits.

**Recommended Resources**

* Fibres
* Material handling equipment’s
* Breaker drawing machines
* Machine maintenance tools
* Breaker draw frame setting tools and equipment
* Consumables
* Cans
* Waste bins

## COMBING OPERATIONS

**UNIT CODE:** ENG/CU/SPG/CR/05/5/A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: **Perform combing operations**

**Duration of Unit:** 50 hours

**Unit Description**

This unit describes the competencies required by a spinning craft person to perform combing operations. It involves competencies required to creel drawn sliver, perform sliver doubling, operate combing machine, and monitor combing process and document combing production

**Summary of Learning Outcomes**

1. Carry out comber lap forming process
2. Creel drawn sliver
3. Perform sliver doubling
4. Operate combing machine
5. Monitor combing process
6. Document combing production

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Carry out comber lap forming process
 | * Definition of lap forming process
* Lap former input materials
* Operation of lap forming machines
* Reference standards
 | * Oral questions
* Written tests
* Observation
* Practicals
 |
| 1. Creel drawn sliver
 | * Comber input material
* Comber input material characteristics
* Reference standards
 | * Oral questions
* Written tests
* Observation
* Practicals
 |
| 1. Perform sliver doubling
 | * Safety precautions
* Combing machines
* Doubling ratios
* Comber setting points
* Comber setting tools and equipment
 | * Oral questions
* Written tests
* Observation
* Practicals
 |
| 1. Operate combing machine
 | * Safety precautions
* Machinery operation manuals
* Combing machines
* Combing machine maintenance
* Housekeeping
 | * Oral questions
* Written tests
* Observation
* Practicals
 |
| 1. Monitor combing process
 | * Combing calculations
* Combing quality control
* Combing process flow
* Combing monitoring points
 | * Oral questions
* Written tests
* Observation
* Practicals
 |
| 1. Document combing production
 | * Documentation tools and equipment
* Technical report writing
* Filing and data storage
 | * Oral questions
* Written tests
* Observation
* Practicals
 |

**Suggested Methods of Instruction**

* Presentations and practical
* Demonstrations by trainer;
* Guided learner activities and research to develop underpinning knowledge;
* Supervised activities and projects in a workshop;
* Visiting lecturer/trainer from textile spinning sector
* Industrial visits.

**Recommended Resources**

* Sliver
* Material handling equipment
* Combing machines
* Machine maintenance tools
* Comber setting tools and equipment
* Machine consumables
* Cans
* Waste bins

## FINISHER DRAWING OPERATIONS

**UNIT CODE:** ENG/CU/SPG/CR/06/5/A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: **Perform finisher-drawing operations**

**Duration of Unit:** 45 hours

**Unit Description**

This unit describes the competencies required by a spinning craft person perform finisher drawing operations. It involves competencies required to feed combed/drawn sliver, set up finisher draw frame, operate finisher draw frame, monitor finisher drawing process and document finisher drawing production

**Summary of Learning Outcomes**

1. Feed combed/drawn sliver
2. Set up finisher draw frame
3. Operate finisher draw frame
4. Monitor finisher drawing process
5. Document finisher drawing production

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Feed combed/drawn sliver
 | * Finisher draw frame input material
* Finisher draw frame input material characteristics
* Reference standards
 | * Oral questions
* Written tests
* Observation
* Practicals
 |
| 1. Set up finisher draw frame
 | * Safety precautions
* Finisher draw frame machines
* Finisher draw frame setting points
* Finisher draw frame setting tools and equipment
 | * Oral questions
* Written tests
* Observation
* Practicals
 |
| 1. Operate finisher draw frame
 | * Safety precautions
* Machinery operation manuals
* Finisher draw frame machines
* Finisher draw frame machine maintenance
* Housekeeping
 | * Oral questions
* Written tests
* Observation
* Practicals
 |
| 1. Monitor finisher drawing process
 | * Finisher drawing calculations
* Finisher drawing quality control
* Finisher drawing process flow
* Finisher drawing monitoring points
 | * Oral questions
* Written tests
* Observation
* Practicals
 |
| 1. Document finisher drawing production
 | * Documentation tools and equipment
* Technical report writing
* Filing and data storage
 | * Oral questions
* Written tests
* Observation
* Practicals
 |

**Suggested Methods of Instruction**

* Presentations and practical
* Demonstrations by trainer;
* Guided learner activities and research to develop underpinning knowledge;
* Supervised activities and projects in a workshop;
* Visiting lecturer/trainer from textile spinning sector
* Industrial visits.

**Recommended Resources**

* Fibres
* Material handling equipment’s
* Finisher drawing machines
* Machine maintenance tools
* Finisher draw frame setting tools and equipment
* Machine consumables
* Cans
* Waste bins

## SIMPLEX OPERATIONS

**UNIT CODE:** ENG/CU/SPG/CR/07/5/A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: **Perform simplex operations**

**Duration of Unit:** 60 hours

**Unit Description**

This unit describes the competencies required by a spinning craft person to perform simplex operations. It involves competencies required to creel drawn sliver, set up simplex machine, operate simplex machine, monitor roving process and document roving production.

**Summary of Learning Outcomes**

1. Creel drawn sliver
2. Set up simplex machine
3. Operate simplex machine
4. Monitor roving process
5. Document roving production.

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Creel drawn sliver
 | * Simplex input material
* Simplex input material characteristics
* Reference standards
 | * Oral questions
* Written tests
* Observation
* Practicals
 |
| 1. Set up simplex machine
 | * Safety precautions
* Simplex machines
* Simplex setting points
* Simplex setting tools and equipment
 | * Oral questions
* Written tests
* Observation
* Practicals
 |
| 1. Operate simplex machine
 | * Safety precautions
* Machinery operation manuals
* Simplex machines
* Simplex machine maintenance
* Housekeeping
 | * Oral questions
* Written tests
* Observation
* Practicals
 |
| 1. Monitor roving process
 | * Roving calculations
* Roving quality control
* Roving process flow
* Roving monitoring points
 | * Oral questions
* Written tests
* Observation
* Practicals
 |
| 1. Document roving production
 | * Documentation tools and equipment
* Technical report writing
* Filing and data storage
 | * Oral questions
* Written tests
* Observation
* Practicals
 |

**Suggested Methods of Instruction**

* Presentations and practical
* Demonstrations by trainer
* Guided learner activities and research to develop underpinning knowledge
* Supervised activities and projects in a workshop
* Visiting lecturer/trainer from the Plants service and repair sector
* Industrial visits.

**Recommended Resources**

* Sliver
* Material handling equipment
* Simplex machines
* Machine maintenance tools
* Simplex setting tools and equipment
* Machine consumables
* Waste bins

## RING SPINNING OPERATIONS

**UNIT CODE:** ENG/CU/SPG/CR/08/5/A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: **Perform ring-spinning operations**

**Duration of Unit:** 70 hours

**Unit Description**

This unit describes the competencies required by a spinning craft person perform ring spinning operations. It involves competencies required to feed roving bobbin on ring frame, set up ring frame, operate ring frame, monitor spinning process and document spinning production

**Summary of Learning Outcomes**

1. Feed roving bobbin on ring frame
2. Set up ring frame
3. Operate ring frame
4. Monitor spinning process
5. Document spinning production

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Feed roving bobbin on ring frame
 | * Ring frame input material
* Ring frame input material characteristics
* Reference standards
 | * Oral questions
* Written tests
* Observation
* Practicals
 |
| 1. Set up ring frame
 | * Safety precautions
* Ring frame machines
* Ring frame setting points
* Ring frame setting tools and equipment
 | * Oral questions
* Written tests
* Observation
* Practicals
 |
| 1. Operate ring frame
 | * Safety precautions
* Machinery operation manuals
* Ring frame machines
* Ring frame machine maintenance
* Housekeeping
 | * Oral questions
* Written tests
* Observation
* Practicals
 |
| 1. Monitor spinning process
 | * Ring spinning calculations
* Ring spinning quality control
* Ring spinning process flow
* Ring spinning monitoring points
 | * Oral questions
* Written tests
* Observation
* Practicals
 |
| 1. Document spinning production
 | * Documentation tools and equipment
* Technical report writing
* Filing and data storage
 | * Oral questions
* Written tests
* Observation
* Practicals
 |

**Suggested Methods of Instruction**

* Presentations and practical
* Demonstrations by trainer;
* Guided learner activities and research to develop underpinning knowledge;
* Supervised activities and projects in a workshop;
* Visiting lecturer/trainer from textile spinning sector;
* Industrial visits.

**Recommended Resources**

* Roving
* Material handling equipment’s
* Ring frame machines
* Machine maintenance tools
* Ring frame setting tools and equipment
* Machine consumables
* Cans
* Waste bins

## CONE WINDING

**UNIT CODE:** ENG/CU/SPG/CR/09/5/A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: **Perform cone winding**

**Duration of Unit:** 40 hours

**Unit Description**

This unit describes the competencies required by a spinning craft person perform cone winding. It involves competencies required to feed ring bobbin on winding unit, operate cone winding machine, stack doffed cones, perform yarn conditioning and packaging and document cone winding production

**Summary of Learning Outcomes**

1. Feed ring bobbin on winding unit
2. Operate cone winding machine
3. Stack doffed cones
4. Perform yarn conditioning packaging
5. Document cone winding production

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Feed ring bobbin on winding unit
 | * Winding unit input material
* Winding unit input material characteristics
* Safety precautions
* Winding unit setting points
* Winding unit setting tools and equipment
* Reference standards
 | * Oral questions
* Written tests
* Observation
* Practicals
 |
| 1. Operate cone winding machine
 | * Safety precautions
* Machinery operation manuals
* Winding unit
* Winding unit maintenance
* Housekeeping
 | * Oral questions
* Written tests
* Observation
* Practicals
 |
| 1. Stack doffed cones
 | * Methods of handling
* Doffed cones characteristics
* Stacking techniques
 | * Oral questions
* Written tests
* Observation
* Practicals
 |
| 1. Perform yarn conditioning packaging
 | * Conditioning reference standards
* Packaging techniques
* Conditioning rooms
* Conditioning equipment
 | * Oral questions
* Written tests
* Observation
* Practicals
 |
| 1. Document cone winding production
 | * Documentation tools and equipment
* Technical report writing
* Filing and data storage
 | * Oral questions
* Written tests
* Observation
* Practicals
 |

**Suggested Methods of Instruction**

* Presentations and practical
* Demonstrations by trainer;
* Guided learner activities and research to develop underpinning knowledge;
* Supervised activities and projects in a workshop;
* Visiting lecturer/trainer from textile spinning sector;
* Industrial visits.

**Recommended Resources**

* Spindles
* Bobbins
* Material handling equipment’s
* Winding unit
* Machine maintenance tools
* Winding unit setting tools and equipment
* Machine consumables
* Cans
* Waste bins

## DOUBLING AND TWISTING OPERATIONS

**UNIT CODE:** ENG/CU/SPG/CR/10/5/A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: **Perform doubling and twisting operations**

**Duration of Unit:** 60 hours

**Unit Description**

This unit describes the competencies required by a spinning craft person to perform doubling and twisting operations. It involves feeding yarn on the doubling/twisting machine, setting-up doubling/twisting machine, operating doubling/twisting machine, monitoring doubling/twisting process and documenting doubling/twisting production.

**Summary of Learning Outcomes**

1. Feed yarn on the doubling/twisting machine
2. Set-up doubling/twisting machine
3. Operate doubling/twisting machine
4. Monitor doubling/twisting process
5. Document doubling/twisting production

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Feed yarn on the doubling/twisting machine
 | * Safety precautions
* Doubling/twisting machines
* Input materials types and characteristics
* Yarn feeding procedures
* Doubling/twisting machine operation
* Reference standards
 | * Written tests
* Oral
* Practicals
* Assignments
* Project
 |
| 1. Set-up doubling/twisting machine
 | * Safety precautions
* Machine operation manual
* Machine setting tools and consumables
* Setting machine parameters
* Machine setting points
 | * Written tests
* Oral questioning
* Assignments
* Practicals
* Project
 |
| 1. Operate doubling/twisting machine
 | * Safety precautions
* Machine operation manuals
* Machines operations
* Machine maintenance
* Housekeeping procedures
* Record keeping
 | * Assignments
* Oral
* Practicals
* Written tests
* Projects
 |
| 1. Monitor doubling/twisting process
 | * Safety precautions
* Machine operation resources
* Quality control
* Machine process flow
* Counter readings
* Production control
* Production calculations
 | * Assignments
* Oral
* Practicals tests
* Observation
* Practicals
* Projects
* Written tests
 |
| 1. Document doubling/twisting production
 | * Documentation tools
* Quality control tests results
* Machine production documents
* Technical report writing
* Filing, data storage and retrieval
 | * Assignments
* Practicals
* Written tests
* Practicals test
 |

**Suggested Methods of Instruction**

* Group discussions
* Demonstration by trainer
* Online video clips
* Power point presentation
* Exercises by trainee

**Recommended Resources**

* Scientific Calculators
* Relevant reference materials
* Stationeries
* Electrical workshop
* Relevant practical materials
* Computers with internet connection