TVET CURRICULUM DEVELOPMENT, ASSESSMENT AND CERTIFICATION COUNCIL

(TVET CDACC)

COMPETENCY BASED CURRICULUM

FOR

TEXTILE PROCESSING

LEVEL 5

TVET CDACC
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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 to reform curriculum development, assessment and certification. This called for a shift to CBET to address the mismatch between skills acquired through training and skills needed by industry as well as increase the global competitiveness of Kenyan labour force.

TVET Curriculum Development, Assessment and Certification Council (TVET CDACC) in conjunction with 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.

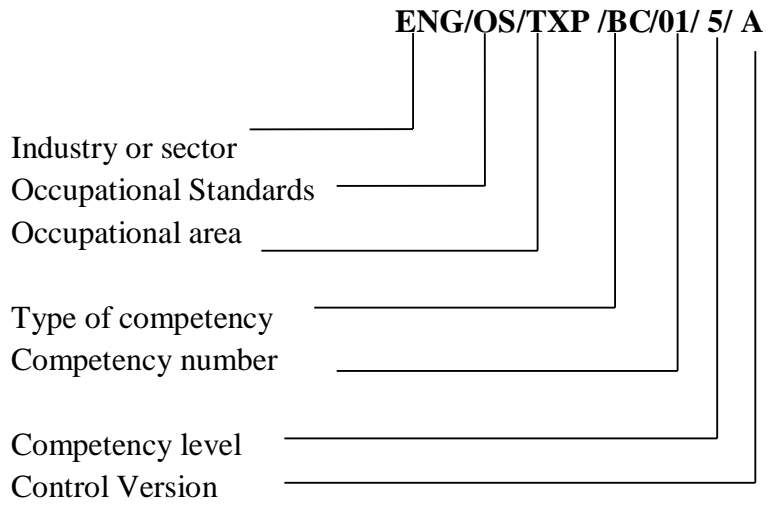**COUNCIL SECRETARY/CEO**
TVET CDACC

ABBREVIATION AND ACRONYMS

BC   Basic Competency
CC   Common Competency
CDACC   Curriculum Development, Assessment and Certification Council
CR   Core Competency
CU   Curriculum
ENG   Engineering
ICT   Information and Communication Technology
IT   Information Technology
KCSE   Kenya Certificate of Secondary Education
OSHA   Occupational Health and Safety Act
PPE   Personal protective equipment
SOP   Standard Operating Procedures
TEX   Textile
TVET   Technical and Vocational Education and Training
TXP   Textile Processing

KEY TO UNIT CODE

ENG/OS/TXP /BC/01/ 5/ A

Industry or sector

Occupational Standards

Occupational area

Type of competency

Competency number

Competency level

Control Version

CONTENTS

COURSE DESCRIPTION

The Textile Processing Level 5 qualification consists of competencies that a person must achieve to enable him/her to work in a Textile Processing plant.

The units of competency comprising the Textile Processing craft person level 5 qualifications include the following basic and core competencies:

BASIC UNITS OF COMPETENCY			
Unit of Learning Code	**Units of Learning Title**	**Duration in Hours**	**Credits Factors**
ENG/CU/TXP/BC/01/5/A	Communication skills	40	4.0
ENG/CU/TXP/BC/02/5/A	Digital literacy	60	6.0
ENG/CU/TXP/BC/03/5/A	Entrepreneurial skills	100	10.0
ENG/CU/TXP/BC/04/5/A	Employability skills	80	8.0
ENG/CU/TXP/BC/05/5/A	Environmental literacy	40	4.0
ENG/CU/TXP/BC/06/5/A	Occupational health and safety	40	4.0
TOTAL		**360**	**36.0**
COMMON UNITS OF COMPETENCY			
ENG/CU/TXP/CC/01/5/A	Technical drawing	150	15
ENG/CU/TXP/CC/02/5/A	Engineering mathematics	150	15
ENG/CU/TXP/CC/03/5/A	Mechanical science principles	85	8.5
ENG/CU/TXP/CC/04/5/A	Fluid mechanics principles	90	9.0
ENG/CU/TXP/CC/05/5/A	Material science principles	85	8.5
TOTAL		**560**	**56.0**
CORE UNITS OF COMPETENCY			
ENG/CU/TXP/CR/01/5/A	Produce pre-treated textiles	150	15
ENG/CU/TXP/CR/02/5/A	Produce dyed textiles	140	14
ENG/CU/TXP/CR/03/5/A	Produce printed textiles	130	13
ENG/CU/TXP/CR/04/5/A	Perform textile finishing	130	13
ENG/CU/TXP/CR/05/5/A	Perform quality control	130	13

ENG/CU/TXP/CR/06/5/A	Perform machine maintenance	130	13
	Industrial attachment	360	36
TOTAL		**1170**	**117**
GRAND TOTAL		**2340**	**234**

1. **Entry Requirements**

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

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

   Or

   b) Level 4 certificate in a related course with **one** year of continuous work experience

   Or

   c) Equivalent qualifications as determined by Kenya National Qualifications Authority (KNQA)

2. **Trainer qualification**

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

3. **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.

4. **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: MIN/CU/TXP/BC/01/5/A

Relationship to Occupational Standards
This unit addresses the Unit of Competency: Demonstrate Communication Skills

Duration of Unit: 25 hours

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

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

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Meet communication needs of clients and colleagues	• 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	• Interview • Third party reports • Written texts

		• Effective questioning techniques (clarifying and probing) • Workplace etiquette • Ethical work practices in handling communication • Active listening • Feedback • Interpretation • Flexibility in communication	
2.	Contribute to the development of communication strategies	• Dynamics of groups • Styles of group leadership • Openness and flexibility in communication • Communication skills relevant to client groups	• Written • Observation
3.	Conduct interviews	• Types of interview • Establishing rapport • Facilitating resolution of issues • Developing action plans	• Written • Observation
4.	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
5.	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: MIN/CU/TXP/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, and 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
2. 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

3.	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
4.	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
5.	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
6.	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: MIN/CU/TXP/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	• Individual/group assignments • Projects • Written tests • Oral questions • Third party report • Interviews

2. 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
3. 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
4. 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
5. 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

6. 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: MIN/CU/TXP/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	- Written tests - Oral questioning - Interviewing - Portfolio of evidence - Third party report

		• 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	
2. 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	
3. Demonstrate critical safe work habits	• Stress and stress management • Punctuality and time consciousness • Leisure • Integrating personal objectives into organizational objectives • Resources utilization • Setting work priorities • HIV and AIDS • Drug and substance abuse • Handling emerging issues	• Written tests • Oral questioning • Interviewing • Portfolio of evidence • Third party report	
4. Lead a small team	• Leadership qualities • Team building • Determination of team roles and objectives	• Written tests • Oral questioning • Interviewing	

	• 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	• Portfolio of evidence • Third party report	

5. 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	

6. 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	
7. 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	• Written tests • Oral questioning • Interviewing • Portfolio of evidence • Third party report	

	• Workplace innovation • Performance improvement • Handling emerging issues • Future trends and concerns in learning	
8. 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
9. 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: MIN/CU/TXP/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	• Written test • Oral questions • Observation

		• Types and uses of PPE in line with environmental regulations • Occupational Safety and Health Standards (OSHS)	
2.	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
3.	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
4.	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
5.	Identify Environmental legislations/con	• Environmental issues/concerns • Environmental legislations /conventions and local ordinances	• Written questions • Oral questions • Observation

ventions for environmental concerns	• Industrial standard /environmental practices • International Environmental Protocols (Montreal, Kyoto) • Features of an environmental strategy	
6. 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
7. 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: MIN/CU/TXP/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
2. Control OSH hazards	• Prevention and control measures, including use of PPE (personal protective equipment) for specific hazards are identified and implemented	• Oral questions • Written tests • Portfolio of evidence • Third party report

	• Appropriate risk controls based on result of OSH hazard evaluation is recommended • Contingency measures, including emergency procedures during workplace incidents and emergencies are recognized and established in accordance with organization procedures		
3. Implement 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
- Assignments
- Discussion
- Q&A
- Role play
- Viewing of related videos

Recommended Resources
- Standard operating and/or other workplace procedures manuals
- Specific job procedures manuals
- Machine/equipment manufacturer's specifications and instructions
- Personal Protective Equipment (PPE) e.g.
  - Mask
  - Face mask/shield
  - Safety boots
  - Safety harness
  - Arm/Hand guard, gloves

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

COMMON UNITS OF LEARNING

TECHNICAL DRAWING

UNIT CODE: ENG/CU/TXP/CC/01/5/A

Relationship to Occupational Standards
This unit addresses the unit of competency: **Prepare and interpret technical drawings**

Duration of Unit: 150 Hours

Unit Description
This unit covers the competencies required to prepare and interpret technical drawings by a Textile Processing 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
2. 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

3.	Produce solid geometry drawings	• Interpretation of sketches and drawings of patterns
		    o Cylinders
		    o Prisms
		    o Pyramids
		• Development of surface of interpenetrating solids and truncated solids
		• Interpenetrations of solids
		    o Cylinder to cylinder,
		    o Cylinder to prism,
		    o Prism to prism of equal and unequal diameters
			• Observation
			• Written tests
			• Oral questioning

4.	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
5.	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

6.	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
			• Practical
			• 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/TXP/CC/02/5/A

Relationship to Occupational Standards
This unit addresses the unit of competency: **Apply engineering mathematics**

Duration of Unit: 150 hours

Unit Description
This unit describes the competencies required by a Textile Processing 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 practical 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	- Written tests - Oral questioning - Assignments - Supervised exercises

		• Conversions into percentages • Direct and inverse proportions determination • Use of scientific calculator	
2.	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
3.	Use trigonometry to solve practical work problems	• Meaning of trigonometry • Pythagoras theorem • Trigonometry ratios of angles • Trigonometric identities • Conversion of angles	• Assignments • Oral questioning • Supervised exercises • Written tests
4.	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 • Practical tests • Observation • Supervised exercises • Written tests
5.	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	• Assignments • Supervised exercises • Written tests

		• Applications of matrices	
6.	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
7.	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
8.	Apply concepts of probability in work	• Meaning of probability	• Written tests

	• Types of probability events • Dependent • Independent • Mutually exclusive • Laws of probability • Counting techniques • Permutation • Combination • Tree diagrams • Ven diagrams	• Assignments • Supervised exercises
9. 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/TXP/CC/03/5/A

Relationship to Occupational Standards
This unit addresses the unit of competency: **Apply Mechanical science principles**

Duration of Unit: 85 hours

Unit Description
This unit describes the competencies required by a Textile Processing 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
2. Determine effects of loading in static and dynamic	• Explain type of forces • Discussion and analysis of reaction of forces	• Written tests • Oral questioning • Assignments • Supervised exercises

	engineering systems	• 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,	
3.	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
4.	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 • Practical tests • Observation • Supervised exercises • Written tests
5.	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 • Practical 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
- Dice
- Computers with internet connection

FLUID MECHANICS PRINCIPLES

UNIT CODE: ENG/CU/TXP/CC/05/5/A

Relationship to Occupational Standards
This unit addresses the unit of competency: **Apply fluid mechanics principles**

Duration of Unit: 90 hours

Unit Description
This unit describes the competencies required by a Textile Processing craft person in order to apply a wide range of fluid mechanics principles in their work. It includes understanding flow of fluids, demonstrating knowledge in viscous flow, performing dimensional analysis and operating fluid pumps.

Summary of Learning Outcomes
1. Understand flow of fluids
2. Demonstrate knowledge in viscous flow
3. Perform dimensional analysis
4. Operate fluid pumps

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Understand flow of fluids	- Flow rate in pipes - Losses in pipes - Causes of losses in pipes - Application of flow loss equations	- Written tests - Oral questioning - Assignments - Supervised exercises
2. Demonstrate knowledge in viscous flow	- Viscous flow between parallel surfaces - Viscous flow equations - Application of viscous flow equations	- Written tests - Oral questioning - Assignments - Supervised exercises
3. Perform dimensional analysis	- Dimensional analysis definition - Principle of dimensional homogeneity - Fundamental dimensions and units - Physical quantities - Application of dimensional analysis	- Assignments - Oral questioning - Supervised exercises - Written tests

4. Operate fluid pumps	• Principle of operation of pumps • Reciprocating pump equation • Centrifugal pump equation • Application of pump equations in problem solving	• Assignments • Oral questioning • Practical tests • Observation • Supervised exercises • Written tests

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
- Relevant practical materials
- Dice
- Computers with internet connection

MATERIAL SCIENCE

UNIT CODE: ENG/CU/TXP/CC/06/5/A

Relationship to Occupational Standards
This unit addresses the unit of competency: **Apply material science principles**

Duration of Unit: 85 hours

Unit Description:
The learner will be introduced to performing material testing. It involves analysing properties of engineering materials, performing extraction processes, producing iron materials, ceramics, composites and alloys, performing heat treatment, material testing and identifying corrosion and its prevention

Summary of Learning Outcomes
1. Analyse properties of engineering materials
2. Perform ore extraction processes
3. Produce iron materials
4. Produce alloy materials
5. Produce non-ferrous materials
6. Produce ceramics materials
7. Produce composite materials
8. Utilise other engineering materials
9. Perform heat treatment
10. Perform material testing
11. Prevent material corrosion

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Analyse properties of engineering materials	• Engineering materials is identified as per the procedures • Physical properties of engineering material • Mechanical properties of engineering materials • Crystal structure of materials	• Written tests • Oral questioning • Assignments • Supervised exercises

2.	Perform ore extraction processes	• Safety measures in metal extraction • Method of metal extraction • Procedure in metal extraction processes • Storing of metal Extraction by-products • Disposing extraction by- products	• Written tests • Oral questioning • Assignments • Supervised exercises
3.	Produce iron materials	• Ore smelting processes. • Composition of iron • Method of producing iron material • Refinement processes	• Assignments • Oral questioning • Supervised exercises • Written tests
4.	Produce alloy materials	• Tools and equipment for alloy production • Alloy formation process • Testing alloy products quality	• Assignments • Oral questioning • Practical tests • Observation • Supervised exercises • Written tests
5.	Produce non-ferrous materials	• Extraction of Non-ferrous materials • Smelting and purifying of extracted non-ferrous material • Testing Non-ferrous material • Identifying Alloying elements for non-ferrous materials • Alloy formation process • Testing of Alloys for non-ferrous material	• Assignments • Supervised exercises • Written tests • Practical test
6.	Produce ceramics materials	• Composition of ceramic materials • Manufacturing process for ceramics • Production of Ceramic materials • Finishing processes for ceramic materials	• Assignments • Supervised exercises • Written tests • Practical test
2.	Produce composite materials	• Types of composites • Elements involve in composite formation • Formation process of composites • Testing of composite materials	• Assignments • Supervised exercises • Written tests • Practical test
3.	Utilise other engineering materials	• Identifying and selecting engineering materials • Developing operation plan • Setting up production machine • Setting production parameters	• Assignments • Supervised exercises • Written tests • Practical test

	• Production process for engineering materials	
4. Perform heat treatment	• Safety practices procedures • Heat treatment processes • Procedure in heat treatment processes • Operations of heat treatment of metals	• Assignments • Supervised exercises • Written tests • Practical test
5. Perform material testing	• Material testing methods • Procedure of material testing • Analysing material testing results • Material testing equipment are taken care of and maintained.	• Assignments • Supervised exercises • Written tests • Practical test
6. Corrosion and its prevention	• Safety observation during corrosion prevention • Corrosion type is identified • Causes of corrosion • Methods of corrosion prevention • Corrosion prevention	• Assignments • Supervised exercises • Written tests • Practical test

Suggested Methods of Instruction
- Demonstration by trainer
- Discussions
- Practical work by trainee(s)
- Exercises
- Industrial visits
- YouTube for teaching/learning and inspiration
- Simulation
- Power point presentation

Recommended Resources
- Measuring tools and gauges
- Marking out tools
- Inspection tools and equipment
- Dressing tools
- Firefighting equipment
- PPEs –dust coat, dust masks, ear muffs, goggles
- First Aid kit
- Brooms and cleaning stuff
- Cleaning detergents
- Drawing papers

CORE UNITS OF LEARNING

TEXTILE PRE-TREATMENT

UNIT CODE: ENG/CU/TXP/CR/01/5/A

Relationship to Occupational Standards
This unit addresses the unit of competency: **Produce pre-treated textiles**

Duration of Unit: 150 hours

Unit Description
This unit describes the competencies required by a textile processing craft person to produce pre-treated textiles. It involves competencies required to obtain grey fabric, inspect grey fabric, carry out singeing, carry out desizing, carry out scouring, carry out bleaching, carry out mercerization, carry out washing and document pre-treatment process.

Summary of Learning Outcomes
1. Obtain grey fabric
2. Inspect grey fabric
3. Carry out singeing
4. Carry out desizing
5. Carry out scouring
6. Carry out bleaching
7. Carry out mercerization
8. Carry out washing
9. Document pre-treatment process

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Obtain Grey fabric	• Classification of fabrics • Classification of yarns • Safety procedures • Operation standards • Characteristics of grey fabric	• Oral questions • Written tests • Observation • Practical • Individual assignments • Group assignments
2. Inspect Grey fabric	• Inspection techniques • Inspection tools • Inspection equipment • Safety measures • Inspection procedure	• Oral questions • Written tests • Observation • Practical

		• Individual assignments • Group assignments
3. Carry out singeing	• Objectives of singeing • Singeing methods • Singeing process • Merits and demerits of singeing • Precautions of singeing	• Oral questions • Written tests • Observation • Practical • Individual assignments • Group assignments
4. Carry out desizing	• Objectives of desizing • Desizing methods • Desizing mechanism/ process • Precautions during desizing • Desizing faults •	• Oral questions • Written tests • Observation • Practical • Individual assignments • Group assignments
5. Carry out scouring	• Objectives of scouring • Scouring methods • Scouring mechanism/ process • Precautions of scouring. • Scouring faults •	• Oral questions • Written tests • Observation • Practical • Individual assignments • Group assignments
6. Carry Out bleaching	• Aim of bleaching • Bleaching methods • Types of bleaching agents • Mechanism of bleaching • Bleaching precautions • Bleaching faults	• Oral questions • Written tests • Observation • Practical • Individual assignments • Group assignments •
7. Carry out mercerization	• Objectives of mercerization • Mercerization process • Significance of different steps in mercerization cycle • Mercerization control parameters • Effects of mercerization • Mercerizing machine	• Oral questions • Written tests • Observation • Practical • Individual assignments • Group assignments
8. Carry out washing	• Objectives of washing • Washing techniques • Washing mechanism • Types of washing agents	• Oral questions • Written tests • Observation • Practical

		• Individual assignments • Group assignments
9. Document pre-treatment process	• Documentation tools and equipment • Technical report writing for maintenance • Filing and data storage	• Oral questions • Written tests • Observation • Practical • Individual assignments • Group assignments

Suggested Methods of Instruction
- Instructor led facilitation of theory
- Illustrative diagrams
- Practical work by trainee(s)
- Group discussions
- Exercises by trainee(s)
- Industrial visits to textile mills pre-treatment department
- Power point presentation and videos

Recommended Resources
- Tools, Equipment, Materials and supplies
- Fabric lot
- Desizing machine
- Singeing machine
- Bleaching machine
- Scouring machine
- Mercerizing machine
- Washing machine
- Bleaching chemicals
- Washing chemicals
- Mercerizing chemicals
- Scouring chemicals
- pH scale
- PPE
- Thermometer
- Rotating batcher
- Fabric Beams
- Documentation tool and equipment
- Stationeries

- Overhead projector/ Black or white board
- Computer and its accessories
- Weighing balance

TEXTILE DYEING

UNIT CODE: ENG/CU/TXP/CR/02/5/A

Relationship to Occupational Standards
This unit addresses the unit of competency: **Produce dyed textiles**

Duration of Unit: 140 hours

Unit description

This unit describes the competencies required by a textile processing craft person to produce dyed textiles. It involves competencies required to obtain textile for dyeing, prepare dyeing recipe, set up dyeing machine, carry out dyeing, carry out washing off and document dyeing process.

Summary of Learning Outcomes
1. Obtain textile for dyeing
2. Prepare dyeing recipe
3. Set up dyeing machine
4. Carry out dyeing
5. Carry out washing off
6. Document dyeing process

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Obtain Textile for Dyeing	• Textile characteristics for dyeing • Textile dye affinity • Types of fabric and yarns • Sampling methods	• Practical • Observation • Written tests • Oral • Individual assignments • Group assignments
2. Prepare Dyeing Recipe	• Classification of dyes • Dye preparation process • Dye standards • Dye and pigment characteristics • Chemistry of dyeing • Principles of dyeing • Color scheme	• Observation • Written tests • Oral • Practical • Individual assignments • Group assignments

3. Set Up Dyeing Machine	• Types of dyeing machines • Components of a dyeing machine • Dyeing machine control parameters • Machine safety	• Practical • Oral • Observation • Written tests • Individual assignments • Group assignments
4. Carry Out Dyeing	• Objectives of dyeing • Dyeing mechanism • Machine safety • Dyeing faults • Dyeing precautions • Dyeing parameters	• Practical • Oral • Observation • Written tests • Individual assignments • Group assignments
5. Carry out washing Off	• Importance of washing • Content of a washing bath • Washing parameters • Washing faults	• Practical • Oral • Observation • Written tests • Individual assignments • Group assignments
6. Document Dyeing Process	• Documentation tools and equipment • Technical report writing for maintenance • Filing and data storage	• Practical • Oral • Observation • Written tests • Individual assignments • Group assignments

Suggested Methods of Instruction
- Demonstration by trainer
- Practical work by trainee(s)
- Dyeing exercises by trainee
- Industrial visits to textile dyeing plants
- Power point presentation

Recommended Resources

- Fabric
- Yarn
- PPE
- Dyes and chemicals
- Dyeing machine
- Washing chemicals
- Thermometer
- Pantone shade card
- Documentation tool and equipment
- Stationeries
- Overhead projector/ Black or white board
- Computer and its accessories
- Weighing balance

TEXTILE PRINTING

UNIT CODE: ENG/CU/TXP/CR/03/5/A

Relationship to Occupational Standards
This unit addresses the unit of competency: **Produce printed fabrics**

Duration of Unit: 130 hours

Unit Description
This unit describes the competencies required by a textile processing craft person to produce printed fabrics. It involves competencies required to obtain fabric for printing, prepare printing recipe prepare print screen, set up printing machine, operate printing machine and document printing process.

Summary of Learning Outcomes
1. Obtain fabric for printing
2. Prepare printing recipe
3. Prepare print screen
4. Set up printing machine
5. Operate printing machine
6. Document printing process.

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Obtain fabric for printing	• Classification of fabric • Properties of the fabric • Safety Precautions • Uses of the fabric	• Oral questions • Written tests • Observation • Practical • Individual assignments • Group assignments •
2. Prepare printing recipe	• Printing recipes • Printing methods • Printing recipe components • Standard shade references • Printing chemicals involved • Safety procedures	• Oral questions • Written tests • Observation • Practical • Individual assignments • Group assignments

3. Prepare print screen	• Types of Emulsion • Screen cleaning techniques • Screen drying techniques • Types of artwork •	• Oral questions • Written tests • Observation • Practical • Individual assignments • Group assignments
4. Set up printing machine	• Safety Precautions • Printing machine • Printing machine parameters • Printing tools and consumables	• Oral questions • Written tests • Observation • Practical • Individual assignments • Group assignments
5. Operate printing machine	• Safety precautions • Machinery Operational Manuals • Printing Faults • Printing wastes	• Oral questions • Written tests • Observation • Practical • Individual assignments • Group assignments
6. Document printing process.	• Technical Report writing • Filing and data storage • Documentation tools and equipment •	• Oral questions • Written tests • Observation • Practical • Individual assignments • Group assignments

Suggested Methods of Instruction

- Theory facilitated by trainer
- Demonstration by trainer
- Practical work by trainee(s)
- Group discussions
- Exercises by trainee(s)
- Field trips to textile mills

Recommended Resources

- Fabric
- PPE
- Printing chemicals
- Printing machine

- Washing chemicals
- Thermometer
- Stationeries
- Overhead projector/ Black or white board
- Computer and its accessories
- Weighing balance

TEXTILE FINISHING

UNIT CODE: ENG/CU/TXP/CR/04/5/A

Relationship to Occupational Standards
This unit addresses the unit of competency: **Perform textile finishing**

Duration of Unit: 130 hours

Unit Description
This unit describes the competencies required by a textile processing craft person to perform textile finishing. It involves competencies required to obtain fabric for finishing, set up finishing machine, carry out mechanical finishes, carry out chemical finishes and document finishing process.

Summary of Learning Outcomes
1. Obtain fabric for finishing
2. Set up finishing machine
3. Carry out mechanical finishes
4. Carry out chemical finishes
5. Document finishing process

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Obtain fabric for finishing	• Safety procedures • Properties of the fabric • Operational Standards	• Oral questions • Written tests • Observation • Practical • Individual assignments • Group assignments
2. Set up finishing machine	• Types of finishing machines • Finishing machine parameters • Finishing tools and consumables • Finishing Machine Manuals • Equipment's, machinery, sensors and control techniques • Working principle of finishing machines	• Oral questions • Written tests • Observation • Practical • Individual assignments • Group assignments

	• Handling and maintenance of finishing machines • Purposes of finishing machines • Embroidery machines • Chemical finishing recipes		
3. Carry out mechanical finishes	• Calendaring • Sanforizing or preshrinking • Compacting • Embossing • Sueding • Raising or napping • Wool glazing • Shearing • Steaming and heat setting • fulling • New technology in mechanical finishing • Mechanical finishing faults • Mercerisation • Polishing • Corduroy cutting • Decating	• Oral questions • Written tests • Observation • Practical • Individual assignments • Group assignments	
4. Carry out chemical finishes	• Anti-soil finish/ soil release finish • Antibacterial finish • Water resistant coating • Antistatic properties • Optical brightening • Softening and elastomeric finishes • Flame retardant finishes • Peach finish • Anti-pilling finish • Non-slip finishing • Absorbent finishes • Antimildew finishing • Colourfastness improving finishes • Enzyme finishes • Emerging trends in chemical finishing • Chemical finishing faults	• Oral questions • Written tests • Observation • Practical • Individual assignments • Group assignments	

5. Document finishing process	• Technical Report writing • Filing and data storage • Documentation tools and equipment • Documentation of control process parameters • Storage of tested finished fabric for conformity to quality	• Oral questions • Written tests • Observation • Practical • Individual assignments • Group assignments

Suggested Methods of Instruction
- Theory facilitated by trainer
- Demonstration by trainer
- Practical work by trainee(s)
- Group discussions
- Exercises by trainee(s)
- Field trips to textile mills

Recommended Resources
- Chemical finishing machines
- Mechanical finishing machines
- Chemical reagents
- Fabric
- Reference standards
- PPEs
- Documentation tool and equipment
- Stationeries
- Overhead projector/ Black or white board
- Computer and its accessories
- Weighing balance

QUALITY CONTROL

UNIT CODE: ENG/CU/TXP/CR/05/5/A

Relationship to Occupational Standards
This unit addresses the unit of competency: **Perform quality control**

Duration of Unit: 130 hours

Unit Description
This unit describes the competencies required by a textile processing craft person to perform quality control. It involves competencies required to obtain fabric sample, prepare fabric sample, set up machine, test textile material, grade final fabric and document inspection results.

Summary of Learning Outcomes
1. Obtain fabric sample
2. Prepare fabric sample
3. Set up machine
4. Test textile material
5. Grade final fabric
6. Document inspection results

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Obtain fabric sample	• Introduction to fabric inspection • Types of fabrics • Characteristics of fabric • Fabric sampling methods • Fabric reference standards	• Oral questions • Written tests • Observation • Practical • Individual assignments • Group assignments
2. Prepare fabric sample	• Sample preparation tools and equipment • Sample preparation procedure • Test samples requirements	• Oral questions • Written tests • Observation • Practical • Individual assignments • Group assignments
3. Set up machine	• Machinery safety	• Oral questions

	• Types of testing machines • Component of testing machines • Testing parameters • •	• Written tests • Observation • Practical • Individual assignments • Group assignments
4. Test textile material	• Safety operations • Equipment operation • Textile material properties • Textile material defects • Textile tests reference standards •	• Oral questions • Written tests • Observation • Practical • Individual assignments • Group assignments
5. Grade final fabric	• Importance of grading fabric • Procedure of grading fabric • Fabric grading systems	• Oral questions • Written tests • Observation • Practical • Individual assignments • Group assignments
6. Document inspection results	• Documentation tools and equipment • Technical report writing • Fabric inspection reference standards • Documentation of testing results • Filing and data storage	• Oral questions • Written tests • Observation • Practical • Individual assignments • Group assignments

Suggested Methods of Instruction
- Theory facilitated by trainer
- Demonstration by trainer
- Practical work by trainee(s)
- Group discussions
- Exercises by trainee(s)
- Field trips to textile mills

Recommended Resources
- Grey fabric sample

- Processed fabric
- Finished fabric
- Tailor Chalk
- Polythene Sheets
- Spectrophotometer
- Nipper
- Pointer
- Comb
- Fault marker
- GSM cutter
- Magnifying glass
- Ends, picks per inch counter
- Needle
- Inspection table
- Inspection machine
- Inspection laboratory
- Documentation tool and equipment
- Stationeries
- Overhead projector/ Black or white board
- Computer and its accessories
- Weighing balance

MACHINE MAINTENANCE

UNIT CODE: ENG/CU/TXP/CR/06/5/A

Relationship to Occupational Standards
This unit addresses the unit of competency: **Perform machine maintenance**

Duration of Unit: 130 hours

Unit Description
This unit describes the competencies required by a textile processing craft person to perform machine maintenance. It involves competencies required to maintain textile processing machine, adjust textile processing machine parts, repair textile processing machine and document maintenance operation.

Summary of Learning Outcomes
1. Maintain Textile Processing Machine
2. Adjust Textile Processing Machine Parts
3. Repair Textile Processing Machine
4. Document Maintenance Operation

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Maintain Textile Processing Machine	• Machinery safety • Electrical safety • Introduction to maintenance • Types of maintenance • Textile processing machines • Workshop tools • Fasteners, sealant and cleaning liquid	• Oral questions • Written tests • Observation • Practical • Individual assignments • Group assignments
2. Adjust Textile Processing Machine Parts	• Machinery safety • Electrical safety • Mechanical systems • Electrical systems • Lubrication systems	• Oral questions • Written tests • Observation • Practical • Individual assignments • Group assignments
3. Repair Textile Processing Machine	• Safety • Machine installation	• Oral questions • Written tests

	• Machine parts • Maintenance inventory management	• Observation • Practical • Individual assignments • Group assignments	
4. Document maintenance operation	• Documentation tools and equipment • Technical report writing for maintenance • Filing and data storage	• Oral questions • Written tests • Observation • Practical • Individual assignments • Group assignments	

Suggested Methods of Instruction

- Assignments to trainee(s)
- Demonstration by trainer
- Industrial visits to textile mills
- PowerPoint presentation and videos
- Practical demonstration by trainee(s)
- Illustrative diagrams and flow charts
- Discussion and focus groups

Recommended Resources

- Oil
- Grease
- Lubricants
- Cutter
- Knotter
- Nipper
- Comb
- Pick counting glass
- Trolley
- Scouring machine
- Desizing machine
- Mercerizing machines
- Washing machines
- Bleaching machines
- Mechanical finishing machine
- Chemical finishing machine
- Singeing machine
- Dyeing machine

- Printing machine
- Stationeries
- Overhead projector/ Black or white board
- Computer and its accessories
- Stationeries
- Overhead projector/ Black or white board
- Computer and its accessories
- Weighing balance