

**REPUBLIC OF KENYA**

**NATIONAL OCCUPATIONAL STANDARDS**

**FOR**

**SPINNING CRAFTPERSON**

**LEVEL 5**



TVET CDACC

P.O. BOX 15745-00100

NAIROBI

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# FOREWORD

The provision of quality education and training is fundamental to the Government’s overall strategy for social economic development. Quality education and training will contribute to achievement of Kenya’s development blueprint, Vision 2030 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 of Kenya 2010 and this resulted to the formulation of the Policy Framework for Reforming Education and Training (Sessional Paper No. 4 of 2016). A key feature of this policy is the radical change in the design and delivery of 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 these Occupational Standards were developed for developing a competency-based curriculum for Spinning Level 5. These Occupational Standards will also be the bases for assessment of an individual for competence certification.

It is my conviction that these Occupational Standards will play a great role towards development of competent human resource for the Textile sector’s growth and 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 in order to address the mismatch between skills acquired through training and skills needed by industry as well as increase the global competitiveness of Kenyan labor force.

The TVET Curriculum Development, Assessment and Certification Council (TVET CDACC), in conjunction with Textile Engineering Sector Skills Advisory Committee (SSAC) have developed these Occupational Standards for Spinning Craft person. These standards will be the bases for development of competency-based curriculum for Spinning Level 5.

The occupational standards are designed and organized with clear performance criteria for each element of a unit of competency. These standards also outline the required knowledge and skills as well as evidence guide.

I am grateful to the Council Members, Council Secretariat, Textile SSAC, expert workers and all those who participated in the development of these Occupational Standards.

**CHAIRPERSON,**

**TVET CDACC**

# ACKNOWLEDGMENT

These Occupational Standards were developed through combined effort of various stakeholders from private and public organizations. I am thankful to the management of these organizations for allowing their staff to participate in this course. I wish to acknowledge the invaluable contribution of industry players who provided inputs towards the development of these Standards.

I thank TVET Curriculum Development, Assessment and Certification Council (TVET CDACC) for providing guidance on the development of these Standards. My gratitude goes to Textile Sector Skills Advisory Committee (SSAC) members for their contribution to the development of these Standards. I thank all the individuals and organizations who participated in the participation of these Standards.

I acknowledge all other institutions that in one way or another contributed to the development of these Occupational Standards.

**CHAIRPERSON,**

**TEXTILE ENGINEERING SECTOR SKILLS ADVISORY COMMITTEE**

# ABBREVIATION AND ACRONYMS

BC Basic Competency

CC Common Competency

CDACC Curriculum Development, Assessment and Certification Council

CPU Control Powering Unit

CR Core Competency

DTI Dial test indicator

ENG Engineering

HVI High Volume Instrument

ICT Information and Communication Technology

IT Information Technology

KCSE Kenya Certificate of Secondary Education

KNQF Kenya National Qualification Framework

OS Occupational Standards

OSHA Occupational Safety and Health Act

PPE Personal protective equipment

SOP Standard Operating Procedures

TQM Total Quality Management

TVET Technical and Vocational Education and Training

# **KEY TO UNIT CODE**

**ENG/OS/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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# OVERVIEW

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

The units of competency comprising the spinning craft person level 5 qualifications include the following basic, common and core competencies:

|  |  |
| --- | --- |
| **BASIC UNITS OF COMPETENCY** | |
| **UNIT OF COMPETENCY CODE** | **UNITS OF COMPETENCY** |
| ENG/OS/SPG/BC /01/ 5/A | Demonstrate communication skills |
| ENG/OS/SPG/BC /02/ 5/A | Demonstrate digital literacy |
| ENG/OS/SPG/BC /03/ 5/A | Demonstrate entrepreneurial skills |
| ENG/OS/SPG/BC /04/ 5/A | Demonstrate employability skills |
| ENG/OS/SPG/BC /05/ 5/A | Demonstrate environmental literacy |
| ENG/OS/SPG/BC /06/ 5/A | Demonstrate occupational health and safety |
| **COMMON UNITS OF COMPETENCY** | |
| ENG/OS/SPG/CC/01/5/A | Prepare and interpret technical drawing |
| ENG/OS/SPG/CC/02/5/A | Apply engineering mathematics |
| ENG/OS/SPG/CC/03/5/A | Apply mechanical science principles |
| ENG/OS/SPG/CC/04/5/A | Perform simple machine maintenance and safety procedures |
| ENG/OS/SPG/CC/05/5/A | Manage spinning wastes |
| **CORE UNITS OF COMPETENCY** | |
| ENG/OS/SPG/CR/01/5/A | Test textile spinning materials |
| ENG/OS/SPG/CR/02/5/A | Perform spinning preparatory operations |
| ENG/OS/SPG/CR/03/5/A | Perform carding operations |
| ENG/OS/SPG/CR/04/5/A | Perform drawing operations |
| ENG/OS/SPG/CR/05/5/A | Perform combing operations |
| ENG/OS/SPG/CR/06/5/A | Perform finisher drawing operations |
| ENG/OS/SPG/CR/07/5/A | Perform speed frame operations |
| ENG/OS/SPG/CR/08/5/A | Perform ring spinning operations |
| ENG/OS/SPG/CR/09/5/A | Perform cone winding |
| ENG/OS/SPG/CR/10/5/A | Perform doubling and twisting operations |

# BASIC UNITS OF COMPETENCY

## DEMONSTRATE COMMUNICATION SKILLS

**UNIT CODE:** ENG/OS/SPG/BC/01/5/A

**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 organization

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**  These describe the key outcomes which make up workplace function | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements.  ***Bold and italicized terms*** ***are elaborated in the Range*** |
| 1. Meet communication needs of clients and colleagues | 1. Specific communication needs of clients and colleagues are identified and met based on workplace requirements 2. Different communication approaches are identified and applied according to clients’ needs 3. Conflict is identified and addressed as per the standards of the organization |
| 1. Contribute to the development of communication strategies | 1. Strategies for internal and external dissemination of information are developed, promoted, implemented and reviewed as per organizations’ strategic plan 2. Channels of communication are established and reviewed based on the workplace needs 3. Communication training needs are identified and provided according to SOPs 4. Work related network and relationship are maintained based on workplace requirements 5. Negotiation and conflict resolution strategies are maintained as per the workplace procedures |
| 1. Conduct workplace interviews | 1. ***Communication strategies*** are identified and employed in ***interview situations*** based on workplace requirements 2. Records of interviews are made and maintained in accordance with organizational procedures 3. Effective questioning, listening and nonverbal communication techniques are used based on needs |
| 1. Facilitate group discussions | 1. Mechanisms to enhance ***effective group interaction*** are identified and implemented according to workplace requirements 2. Strategies to encourage group participation are identified and used as per organizations’ procedures 3. Meetings objectives and agenda are set and followed based on workplace requirements 4. Relevant information is provided and feedback obtained according to set protocols 5. Evaluation of group communication strategies is undertaken in accordance with workplace guidelines 6. Specific communication needs of individuals are identified and addressed as per individual needs |
| 1. Represent the organization | 1. Relevant presentation are researched and presented based on internal or external communication forums requirements Presentation is delivered in a clear and sequential manner as per the predetermined time 2. Presentation is made as per appropriate media 3. Difference views are respected based on workplace procedures 4. Written communication is done as per organizational standards 5. Inquiries are responded according to organizational standard |

**RANGE**

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Communication strategies may include but not limited to: | * Language switch * Comprehension check * Repetition * Asking confirmation * Paraphrase * Clarification request * Translation * Restructuring * Approximation * Generalization |
| 1. Effective group interaction may include but not limited to: | * Identifying and evaluating what is occurring within an interaction in a non-judgmental way * Using active listening * Making decision about appropriate words, behavior * Putting together response which is culturally appropriate * Expressing an individual perspective * Expressing own philosophy, ideology and background and exploring impact with relevance to communication * Openness and flexibility in communication |
| 1. Interview situations may include but not limited to: | * Establishing rapport * Eliciting facts and information * Facilitating resolution of issues * Developing action plans * Diffusing potentially difficult situations |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Active listening
* Giving/receiving feedback
* Interpretation of information
* Role boundaries setting
* Negotiation
* Communication

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Communication process
* Dynamics of groups and different styles of group leadership
* Communication skills relevant to client groups
* Flexibility in communication

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical aspects of Competency | Assessment requires evidence that the candidate:   1. Met communication needs of clients and colleagues 2. Contributed to the development of communication strategies 3. Conducted interviews 4. Facilitated group discussions 5. Represented the organization |
| 1. Resource Implications | The following resources should be provided:   1. Access to relevant workplace or appropriately simulated environment where assessment can take place 2. Materials relevant to the proposed activity or tasks |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   1. Observation 2. Oral questioning 3. Written test 4. Portfolio of Evidence 5. Interview 6. Third party report |
| 1. Context of Assessment | Competency may be assessed:   1. On the job 2. Off the job 3. During industrial attachment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## DEMONSTRATE DIGITAL LITERACY

**UNIT CODE:** ENG/OS/SPG/BC/02/5/A

**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**.**

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**  These describe the key outcomes which make up workplace function | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements.  ***Bold and italicized terms*** ***are elaborated in the Range*** |
| 1. Identify appropriate computer software and hardware | 1. Concepts of ICT are determined in accordance with computer equipment 2. Classifications of computers are determined in accordance with manufacturers specification 3. ***Appropriate computer software*** is identified according to manufacturer’s specification 4. ***Appropriate computer hardware*** is identified according to manufacturer’s specification 5. Functions and commands ofoperating system are determined in accordance withmanufacturer’s specification |
| 1. Apply security measures to data, hardware, software in automated environment | 1. ***Data security and privacy are classified*** in accordance with the prevailing technology 2. ***Security threats*** areidentified, **and *control measures*** are applied in accordance with laws governing protection of ICT 3. Computer threats and crimes are detected in accordance with Information security management guidelines 4. Protection against computer crimes is undertaken in accordance with laws governing protection of ICT |
| 1. Apply computer software in solving tasks | 1. ***Word processing concepts***are applied in resolving workplace tasks, report writing and documentation as per job requirements 2. ***Word processing utilities*** are applied in accordance with workplace procedures 3. Worksheet layout is prepared in accordance with work procedures 4. Worksheet is build and data manipulated in the worksheet in accordance with workplace procedures 5. Continuous data manipulated on worksheet is undertaken in accordance with work requirements 6. Database design and manipulation is undertaken in accordance with office procedures 7. Data sorting, indexing, storage, retrieval and security is provided in accordance with workplace procedures |
| 1. Apply internet and email in communication at workplace | 1. Electronic mail addresses are opened and applied in workplace communication in accordance with office policy 2. Office internet functions are defined and executed in accordance with office procedures 3. ***Network configuration*** is determined in accordance with office operations procedures 4. Official World Wide Web is installed and managed according to workplace procedures |
| 1. Apply desktop publishing in official assignments | 1. Desktop publishing functions and tools are identified in accordance with manufactures specifications 2. Desktop publishing tools are developed in accordance with work requirements 3. Desktop publishing tools are applied in accordance with workplace requirements 4. Typeset work is enhanced in accordance with workplace standards |
| 1. Prepare presentation packages | 1. Types of presentation packages are identified in accordance with office requirements 2. Slides are created and formulated in accordance with workplace procedures 3. Slides are edited and run in accordance with work procedures 4. Slides and handouts are printed according to work requirements |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Appropriate computer hardware may include but not limited to: | * Computer case * Monitor * keyboard * mouse |
| 1. Data security and privacy may include but not limited to: | * Confidentiality of data * Cloud computing * Integrity -but-curious data surfing |
| 1. Security and control measures may include but not limited to: | * Counter measures against cyber terrorism * Risk reduction * Cyber threat issues * Risk management * Pass wording |
| 1. Security threats may include but not limited to: | * Cyber terrorism * Hacking |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Analytical skills
* Interpretation
* Typing
* Communication
* Basic ICT skills

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Software concept
* Functions of computer software and hardware
* Data security and privacy
* Computer security threats and control measures
* Technology underlying cyber-attacks and networks
* Cyber terrorism
* Computer crimes
* Detection and protection of computer crimes
* Laws governing protection of ICT
* Microsoft suite

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency | Assessment requires evidence that the candidate:   1. Identified and controlled security threats 2. Detected and protected computer crimes 3. Applied word processing in office tasks 4. Designed, prepared work sheet and applied data to the cells in accordance to workplace procedures 5. Opened electronic mail for office communication as per workplace procedure 6. Installed internet and World Wide Web for office tasks in accordance with office procedures 7. Integrated emerging issues in computer ICT applications 8. Applied laws governing protection of ICT |
| 1. Resource Implications | The following resources should be provided:   1. Tablets 2. Laptops 3. Desktop computers 4. Calculators 5. Internet 6. Smart phones 7. Operation Manuals |
| 1. Methods of Assessment | Competency may be assessed through:   1. Written Test 2. Observation 3. Practical assignment 4. Interview/Oral Questioning |
| 1. Context of Assessment | Competency may be assessed in:   1. Off the job 2. On the job setting 3. Industrial attachment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# 

## DEMONSTRATE ENTREPRENEURIAL SKILLS

**UNIT CODE :** ENG/OS/SPG/BC/03/5/A

**UNIT DESCRIPTION**

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

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**  These describe the key outcomes which make up workplace function | **PERFORMANCE CRITERIA**  These are assessable statements that specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the Range*** |
| 1. Demonstrate understanding of an Entrepreneur | 1. Entrepreneurs and Businesspersons are distinguished as per principles of entrepreneurship 2. ***Types of entrepreneurs*** are identified as per principles of entrepreneurship 3. Ways of becoming an Entrepreneur are identified as per principles of Entrepreneurship 4. ***Characteristics of Entrepreneurs*** are identified as per principles of Entrepreneurship 5. Factors affecting Entrepreneurship development are explored as per principles of Entrepreneurship |
| 1. Demonstrate understanding of Entrepreneurship and self-employment | 1. Entrepreneurship and self-employment are distinguished as per principles of entrepreneurship 2. Importance of self-employment is analysed based on business procedures and strategies 3. ***Requirements for entry into self-employment*** are identified according to business procedures and strategies 4. Role of an Entrepreneur in business is determined according to business procedures and strategies 5. Contributions of Entrepreneurs to National development are identified as per business procedures and strategies 6. Entrepreneurship culture in Kenya is explored as per business procedures and strategies 7. Born or made Entrepreneurs are distinguished as per entrepreneurial traits |
| 1. Identify Entrepreneurship opportunities | 1. Sources of business ideas are identified as per business procedures and strategies 2. Business ideas and opportunities are generated as per business procedures and strategies 3. Business life cycle is analysed as per business procedures and strategies 4. Legal aspects of business are identified as per procedures and strategies 5. Product demand is assessed as per market strategies 6. Types of ***business environment*** are identified and evaluated as per business procedures 7. Factors to consider when evaluating business environment are explored based on business procedure and strategies 8. Technology in business is incorporated as per best practice |
| 1. Create entrepreneurial awareness | 1. ***Forms of businesses*** are explored as per business procedures and strategies 2. Sources of business finance are identified as per business procedures and strategies 3. Factors in selecting source of business finance are identified as per business procedures and strategies 4. ***Governing policies*** on Small Scale Enterprises (SSEs) are determined as per business procedures and strategies 5. Problems of starting and operating SSEs are explored as per business procedures and strategies |
| 1. Apply entrepreneurial motivation | 1. ***Internal and external motivation*** factors are determined in accordance with motivational theories 2. Self-assessment is carried out as per entrepreneurial orientation 3. Effective communications are carried out in accordance with communication principles 4. Entrepreneurial motivation is applied as per motivational theories |
| 1. Develop innovative business strategies | 1. Business innovation strategies are determined in accordance with the organization strategies 2. Creativity in business development is demonstrated in accordance with business strategies 3. ***Innovative business strategies*** are developed as per business principles 4. Linkages with other entrepreneurs are created as per best practice 5. ICT is incorporated in business growth and development as per best practice |
| 1. Develop Business Plan | 1. Identified Business is described as per business procedures and strategies 2. Marketing plan is developed as per business plan format 3. Organizational/Management plan is prepared in accordance with business plan format 4. Production/operation plan in accordance with business plan format 5. Financial plan is prepared in accordance with the business plan format 6. Executive summary is prepared in accordance with business plan format 7. Business plan is presented as per best practice |

**RANGE**

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Types of entrepreneurs may include but not limited to: | * Innovators * Imitators * Craft * Opportunistic * Speculators |
| 1. Characteristics of Entrepreneurs may include but not limited to: | * Creative * Innovative * Planner * Risk taker * Networker * Confident * Flexible * Persistent * Patient * Independent * Future oriented * Goal oriented |
| 1. Requirements for entry into self-employment may include but not limited to | * Technical skills * Management skills * Entrepreneurial skills * Resources * Infrastructure |
| 1. Internal and external motivation may include but not limited to: | * Interest * Passion * Freedom * Prestige * Rewards * Punishment * Enabling environment * Government policies |
| 1. Business environment may include but not limited to: | * External * Internal * Intermediate |
| 1. Forms of businesses may include but not limited to: | * Sole proprietorship * Partnership * Limited companies * Cooperatives |
| 1. Governing policies may include but not limited to: | * Increasing scope for finance * Promoting cooperation between entrepreneurs and private sector * Reducing regulatory burden on entrepreneurs * Developing IT tools for entrepreneurs |
| 1. Innovative business strategies may include but not limited to: | * New products * New methods of production * New markets * New sources of supplies * Change in industrialization |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Analytical
* Management
* Problem-solving
* Root-cause analysis
* Communication

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Decision making
* Business communication
* Change management
* Competition
* Risk
* Net working
* Time management
* Leadership
* Factors affecting entrepreneurship development
* Principles of Entrepreneurship
* Features and benefits of common operational practices, e. g., continuous improvement (kaizen), waste elimination,
* Conflict resolution
* Health, safety and environment (HSE) principles and requirements
* Customer care strategies
* Basic financial management
* Business strategic planning
* Impact of change on individuals, groups and industries
* Government and regulatory processes
* Local and international market trends
* Product promotion strategies
* Market and feasibility studies
* Government and regulatory processes
* Local and international business environment
* Relevant developments in other industries
* Regional/ County business expansion strategies

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency | Assessment requires evidence that the candidate:   1. Distinguished entrepreneurs and business persons correctly 2. Identified ways of becoming an entrepreneur appropriately 3. Explored factors affecting entrepreneurship development appropriately 4. Analysed importance of self-employment accurately 5. Identified requirements for entry into self-employment correctly 6. Identified sources of business ideas correctly 7. GeneratedBusiness ideas and opportunities correctly 8. Analysed business life cycle accurately 9. Identified legal aspects of business correctly 10. Assessed product demand accurately 11. Determined Internal and external motivation factors appropriately 12. Carried out communications effectively 13. Identified sources of business finance correctly 14. Determined Governing policy on small scale enterprise appropriately 15. Explored problems of starting and operating SSEs effectively 16. Developed Marketing, Organizational/Management, Production/Operation and Financial plans correctly 17. Prepared executive summary correctly 18. Determined business innovative strategies appropriately 19. Presented business plan effectively |
| 1. Resource Implications | The following resources should be provided:   1. Access to relevant workplace where assessment can take place 2. Appropriately simulated environment where assessment can take place |
| 1. Methods of Assessment | Competency may be assessed through:   1. Written tests 2. Oral questions 3. Third party report 4. Interviews 5. Portfolio |
| 1. Context of Assessment | Competency may be assessed:   1. On-the-job 2. Off-the –job 3. During Industrial attachment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## DEMONSTRATE EMPLOYABILITY SKILLS

**UNIT CODE:** ENG/OS/SPG/BC/04/5/A

**UNIT DESCRIPTION**

This unit covers competencies required to demonstrate employability skills. It involves conducting self-management, demonstrating interpersonal communication, critical safe work habits, leading small teams, planning and organizing work, maintaining professional growth and development, demonstrating workplace learning, problem solving skills and managing workplace ethics.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**  These describe the key outcomes which make up workplace function. | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the Range*** |
| 1. Conduct self-management | 1. Personal vision, mission and goals are formulated based on potential and in relation to organization objectives 2. Emotional intelligence is demonstrated as per workplace requirements. 3. Individual performance is evaluated and monitored according to the agreed targets. 4. Assertiveness is developed and maintained based on the requirements of the job. 5. Accountability and responsibility for own actions are demonstrated based on workplace instructions. 6. Self-esteem and a positive self-image are developed and maintained based on values. 7. Time management, attendance and punctuality are observed as per the organization policy. 8. Goals are managed as per the organization’s objective 9. Self-strengths and weaknesses are identified based on personal objectives |
| 1. Demonstrate interpersonal communication | 1. Writing skills are demonstrated as per communication policy 2. Negotiation and persuasion skills are demonstrated as per communication policy 3. Internal and external stakeholders’ needs are identified and interpreted as per the communication policy 4. Communication networks are established based on workplace policy 5. Information is shared as per communication policy |
| 1. Demonstrate critical safe work habits | 1. Stress is managed in accordance with workplace policy. 2. Punctuality and time consciousness is demonstrated in line with workplace policy. 3. Personal objectives are integrated with organization goals based on organization’s strategic plan. 4. ***Resources*** are utilized in accordance with workplace policy. 5. Work priorities are set in accordance to workplace goals and objectives. 6. Leisure time is recognized and utilized in line with personal objectives. 7. ***Drugs and substances of abuse*** are identified and avoided based on workplace policy. 8. HIV and AIDS prevention awareness is demonstrated in line with workplace policy. 9. Safety consciousness is demonstrated in the workplace based on organization safety policy. 10. ***Emerging issues*** are identified and dealt with in accordance with organization policy. |
| 1. Lead small teams | 1. Performance targets for the ***team*** are set based on organization’s objectives 2. Duties are assigned in accordance with the organization policy. 3. ***Forms of communication*** in a team are established according to organization’s policy. 4. Team performance is evaluated based on set targets as per workplace policy. 5. Conflicts are resolved between team members in line with organization policy. 6. Gender related issues are identified and mainstreamed in accordance workplace policy. 7. Human rights and fundamental freedoms are identified and respected as Constitution of Kenya 2010. 8. Healthy relationships are developed and maintained in line with workplace. |
| 1. Plan and organize work | 1. Task requirements are identified as per the workplace objectives 2. Task is interpreted in accordance with safety (OHS), environmental requirements and quality requirements 3. Work activity is organized with other involved personnel as per the SOPs 4. Resources are mobilized, allocated and utilized to meet project goals and deliverables. 5. Work activities are monitored and evaluated in line with organization procedures. 6. Job planning is documented in accordance with workplace requirements. 7. Time is managed achieve workplace set goals and objectives. |
| 1. Maintain professional growth and development | 1. Personal training needs are identified and assessed in line with the requirements of the job. 2. ***Training and career opportunities*** are identified and utilized based on job requirements. 3. Resources for training are mobilized and allocated based organizations and individual skills needs. 4. Licensees and certifications relevant to job and career are obtained and renewed as per policy. 5. Work priorities and personal commitments are balanced and managed based on requirements of the job and personal objectives. 6. Recognitions are sought as proof of career advancement in line with professional requirements. |
| 1. Demonstrate workplace learning | 1. Learning opportunities are sought and managed based on job requirement and organization policy. 2. Improvement in performance is demonstrated based on courses attended. 3. Application of learning is demonstrated in both technical and non-technical aspects based on requirements of the job 4. Time and effort is invested in learning new skills based on job requirements 5. Initiative is taken to create more effective and efficient processes and procedures in line with workplace policy. 6. New systems are developed and maintained in accordance with the requirements of the job. 7. Awareness of personal role in workplace ***innovation*** is demonstrated based on requirements of the job. |
| 1. Demonstrate problem solving skills | 1. Creative, innovative and practical solutions are developed based on the problem 2. Independence and initiative in identifying and solving problems is demonstrated based on requirements of the job. 3. Team problems are solved as per the workplace guidelines 4. Problem solving strategies are applied as per the workplace guidelines 5. Problems are analysed and assumptions tested as per the context of data and circumstances |
| 1. Demonstrate workplace ethics | 1. Policies and guidelines are observed as per the workplace requirements 2. Self-worth and professionalism is exercised in line with personal goals and organizational policies 3. Code of conduct is observed as per the workplace requirements 4. Integrity is demonstrated as per legal requirement |

**RANGE**

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

|  |  |
| --- | --- |
| **Range** | **Variable** |
| 1. Drug and substance abuse may include but not limited to: | Commonly abused   * Alcohol * Tobacco * Miraa * Over-the-counter drugs * Cocaine * Bhang * Glue |
| 1. Feedback may include but not limited to: | * Verbal * Written * Informal * Formal |
| 1. Relationships may include but not limited to: | * Man/Woman * Trainer/trainee * Employee/employer * Client/service provider * Husband/wife * Boy/girl * Parent/child * Sibling relationships |
| 1. Forms of communication may include but not limited to: | * Written * Visual * Verbal * Non verbal * Formal and informal |
| 1. Team may include but not limited to: | * Small work group * Staff in a section/department * Inter-agency group |
| 1. Personal growth may include but not limited to: | |  | | --- | | * Growth in the job * Career mobility * Gains and exposure the job gives * Net workings * Benefits that accrue to the individual as a result of noteworthy performance | |
| 1. Personal objectives may include but not limited to: | * Long term * Short term * Broad * Specific |
| 1. Trainings and career opportunities may include but not limited to | * Participation in training programs * Technical * Supervisory * Managerial * Continuing Education * Serving as Resource Persons in conferences and workshops |
| 1. Resource may include but not limited to: | * Human * Financial * Hardware * Software |
| 1. Innovation may include but not limited to: | * New ideas * Original ideas * Different ideas * Methods/procedures * Processes * New tools |
| 1. Emerging issues may include but not limited to: | * Terrorism * Social media * National cohesion * Open offices |
| 1. Range of media for learning may include but not limited to: | * Mentoring * peer support and networking * IT and courses |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Communication
* Critical thinking
* Observation
* Organizing
* Negotiation
* Monitoring
* Evaluation
* Record keeping
* Problem solving
* Decision Making
* Resource utilization
* Resource mobilization

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Work values and ethics
* Company policies
* Company operations, procedures and standards
* Occupational Health and safety procedures
* Fundamental rights at work
* Personal hygiene practices
* Workplace communication
* Concept of time
* Time management
* Decision making
* Types of resources
* Work planning
* Resources and allocating resources
* Organizing work
* Monitoring and evaluation
* Record keeping
* Workplace problems and how to deal with them
* Gender mainstreaming
* HIV and AIDS
* Drug and substance abuse
* Leadership
* Safe work habits
* Professional growth and development
* Technology in the workplace
* Emerging issues
* Social media
* Terrorism
* National cohesion

###### **EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical aspects of Competency | Assessment requires evidence that the candidate:   1. Conducted self-management 2. Demonstrated interpersonal communication 3. Demonstrated critical safe work habits 4. Led small teams 5. Planned and organized work 6. Maintained professional growth and development 7. Demonstrated workplace learning 8. Demonstrated problem solving skills 9. Demonstrated workplace ethics |
| 1. Resource Implications | |  | | --- | | The following resources should be provided:   1. Access to relevant workplace where assessment can take place 2. Appropriately simulated environment where assessment can take place | |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   1. Oral questioning 2. Portfolio of evidence 3. Third Party Reports 4. Written tests |
| 1. Context of Assessment | Competency may be assessed:   1. On-the-job 2. Off-the –job 3. During Industrial attachment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## DEMONSTRATE ENVIRONMENTAL LITERACY

**UNIT CODE:** ENG/OS/SPG/BC/05/5/A

**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.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**  These describe the key outcomes that make up workplace function. | **PERFORMANCE CRITERIA**  These assessable statements specify the required level of performance for each of the elements.  ***Bold and italicized terms*** ***are elaborated in the Range*** |
| 1. Control environmental hazard | 1. ***Storage methods*** for environmentally***hazardous*** materials are strictly followed according to environmental regulations and OSHS. 2. ***Disposal methods*** of hazardous wastes are followed always according to environmental regulations and OSHS. 3. ***PPE*** is used according to OSHS. |
| 1. Control environmental Pollution control | 1. Environmental pollution ***control measures*** are compiled following standard protocol. 2. Procedures for solid waste management are observed according to Environmental Management and Coordination Act 1999 3. Methods for minimizing ***noise pollution*** is complied with based on Noise and Excessive Vibration Pollution and *Control* Regulations, 2009 |
| 1. Demonstrate sustainable resource use | 1. Methods for minimizing wastage are complied with. 2. Waste management procedures are employed following principles of 3Rs (Reduce, Reuse, Recycle) 3. Methods for economizing and reducing resource consumption are practiced as per the Environmental Management and Coordination Act 1999 |
| 1. Evaluate current practices in relation to resource usage | 1. Information on resource efficiency ***systems and procedures*** are collected and provided to the work group where appropriate. 2. Current resource usage is measured and recorded by members of the work group. 3. Current purchasing strategies are analyzed and recorded according to industry procedures. 4. Current work processes to access information and data is analyzed following enterprise protocol. |
| 1. Identify Environmental legislations/conventions for environmental concerns | 1. Environmental ***legislations/conventions*** and local ordinances are identified according to the different ***environmental aspects/impact*** 2. ***Industrial standard/environmental practices*** are described according to the different environmental concerns |
| 1. Implement specific environmental programs | 1. Programs/Activities are identified according to organizations policies and guidelines. 2. Individual roles/responsibilities are determined and performed based on the activities identified. 3. Problems/constraints encountered are resolved in accordance with organizations’ policies and guidelines 4. Stakeholders are consulted based on company guidelines |
| 1. Monitor activities on Environmental protection/Programs | 1. Activities are periodically monitored and evaluated according to the objectives of the environmental Program 2. Feedback from stakeholders are gathered and considered in proposing enhancements to the program based on consultations 3. Data gathered are analyzed based on evaluation requirements 4. Recommendations are submitted based on the findings 5. Management support systems are set/established to sustain and enhance the program 6. Environmental incidents are monitored and reported to concerned/proper authorities |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. PPE may include but not limited to: | * Mask * Gloves * Goggles * Safety hat * Overall * Hearing protector * Safety boots |
| 1. Environmental pollution control measures may include but not limited to: | * Methods for minimizing or stopping spread and ingestion of airborne particles * Methods for minimizing or stopping spread and ingestion of gases and fumes * Methods for minimizing or stopping spread and ingestion of liquid wastes |
| 1. Waste management procedures may include but not limited to: | * Sorting * Storing of items * Recycling of items * Disposal of items |
| 1. Resources may include but not limited to: | * Electric * Water * Fuel * Telecommunications * Supplies * Materials |
| 1. Workplace environmental hazards may include but not limited to: | * Biological hazards * Chemical and dust hazards * Physical hazards |
| 1. Organizational systems and procedures may include but not limited to: | * Supply chain, procurement and purchasing * Quality assurance * Making recommendations and seeking approvals |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Observation
* Measuring
* Writing
* Communication
* Analytical
* Monitoring
* Evaluation

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Storage methods of environmentally hazardous materials
* Disposal methods of hazardous wastes
* Usage of PPE Environmental regulations
* OSHS
* Types of pollution
* Environmental pollution control measures
* Different solid wastes
* Solid waste management
* Different noise pollution
* Methods of minimizing noise pollution
* Solid Waste Act
* Methods of minimizing wastage
* Waste management procedures
* Economizing of resource consumption
* 3Rs principle
* Types of resources
* Techniques in measuring current usage of resources
* Calculating current usage of resources
* Types of workplace environmental hazards
* Environmental regulations
* Environmental regulations applying to the enterprise.
* Measurement and recording of current resource usage
* Analysis current work processes to access information and data Analysis of data and information
* Identification of areas for improvement
* Resource consuming processes
* Determination of quantity and nature of resource consumed
* Analysis of resource flow of different parts of the resource flow process
* Use/conversion of resources
* Causes of low efficiency of use
* Increasing the efficiency of resource use
* Inspection of resource use plans
* Regulations/licensing requirements
* Determine benefit/cost for alternative resource sources
* Benefit/costs for different alternatives
* Components of proposals
* Criteria on ranking proposals
* Regulatory requirements
* Proposals for improving resource efficiency
* Implementation of resource efficiency plans
* Procedures in monitor implementation
* Adjustments of implementation plan
* Inspection of new resource usage

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency | Assessment requires evidence that the candidate:   1. Controlled environmental hazard 2. Controlled environmental pollution 3. Demonstrated sustainable resource use 4. Evaluated current practices in relation to resource usage 5. Demonstrated knowledge of environmental legislations and local ordinances according to the different environmental issues /concerns. 6. Described industrial standard environmental practices according to the different environmental issues/concerns. 7. Resolved problems/ constraints encountered based on management standard procedures 8. Implemented and monitored environmental practices on a periodic basis as per company guidelines 9. Recommended solutions for the improvement of the Program 10. Monitored and reported to proper authorities any environmental incidents |
| 1. Resource Implications | The following resources should be provided:   1. Workplace with storage facilities 2. Tools, materials and equipment relevant to the tasks (ex. Cleaning tools, cleaning materials, trash bags, etc.) 3. PPE 4. Manuals and references 5. Legislation, policies, procedures, protocols and local ordinances relating to environmental protection 6. Case studies/scenarios relating to environmental Protection |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   1. Observation 2. Oral questioning 3. Written test 4. Interview/Third Party Reports 5. Portfolio of evidence |
| 1. Context of Assessment | Competency may be assessed:   1. On-the-job 2. Off-the –job 3. During Industrial attachment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## DEMONSTRATE OCCUPATIONAL SAFETY AND HEALTH PRACTICES

**UNIT CODE:** ENG/OS/SPG/BC/06/5/A

**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

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**  These describe the key outcomes which make up workplace function. | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the Range*** |
| 1. Identify workplace hazards and risk | 1. ***Hazards*** in the workplace are identified ***based their indicators*** 2. Risks and hazards are evaluated based on legal requirements. 3. ***OSH concerns*** raised by workers are addressed as per legal requirements. |
| 1. Control OSH hazards | 1. Hazard prevention ***and control measures*** are implemented as per legal requirement. 2. Risk assessment is conductedand a risk matrix developed based on likely impact. 3. ***Contingency measures***, including ***emergency procedures*** during workplace ***incidents and emergencies*** are recognized and established in accordance with organization procedures. |
| 1. Implement OSH programs | 1. Company OSH program are identified, evaluated and reviewed based on legal requirements. 2. Company OSH programs are implemented as per legal requirements. 3. Workers are capacity built on OSH standards and procedures as per legal requirements 4. ***OSH-related records*** are maintained as per legal requirements. |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Hazards may include but are not limited to: | * Physical hazards * Biological hazards * Chemical hazards * Ergonomics * Psychological factors * Physiological factors * Safety hazards * Unsafe workers’ act |
| 1. Indicators may include but are not limited to: | * Increased of incidents of accidents, injuries * Increased occurrence of sickness or health complaints/ symptoms * Common complaints of workers related to OSH * High absenteeism for work-related reasons |
| 1. Evaluation and/or work environment measurements may include but are not limited to: | * Health Audit * Safety Audit * Work Safety and Health Evaluation * Work Environment Measurements of Physical and Chemical Hazards |
| 1. OSH issues and/or concerns may include but are not limited to: | * Workers’ experience/observance on presence of work hazards * Unsafe/unhealthy administrative arrangements (prolonged work hours, no break time, constant overtime, scheduling of tasks) * Reasons for compliance/non-compliance to use of PPEs or other OSH procedures/policies/guidelines |
| 1. Prevention and control measures may include but are not limited to: | * Eliminate the hazard * Isolate the hazard * Substitute the hazard with a safer alternative * Use administrative controls to reduce the risk * Use engineering controls to reduce the risk * Use personal protective equipment * Safety, Health and Work Environment Evaluation * Periodic and/or special medical examinations of workers |
| 1. Safety gears /PPE (Personal Protective Equipment’s) may include but are not limited to: | * 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 |
| 1. Appropriate risk controls | * Eliminate the hazard altogether * Isolate the hazard from anyone who could be harmed * Substitute the hazard with a safer alternative * Use administrative controls to reduce the risk * Use engineering controls to reduce the risk * Use personal protective equipment |
| 1. Contingency measures may include but are not limited to: | * Evacuation * Isolation * Decontamination * Emergency personnel |
| 1. Emergency procedures may include but are not limited to: | * Fire drill * Earthquake drill * Basic life support/CPR * First aid * Spillage control * Decontamination of chemical and toxic * Disaster preparedness/management * Set of fire-extinguisher |
| 1. Incidents and emergencies may include but are not limited to: | * Chemical spills * Equipment/vehicle accidents * Explosion * Fire * Gas leak * Injury to personnel * Structural collapse * Toxic and/or flammable vapors emission. |
| 1. OSH-related Records may include but are not limited to: | * Medical/Health records * Incident/accident reports * Sickness notifications/sick leave application * OSH-related trainings obtained |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Communication
* Interpersonal
* Presentation
* Risk assessment
* Evaluation
* Critical thinking
* Problem solving
* Negotiation

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* General OSH Principles
* Occupational hazards/risks recognition
* OSH organizations providing services on OSH evaluation and/or work environment measurements (WEM)
* National OSH regulations; company OSH policies and protocols
* Systematic gathering of OSH issues and concerns
* General OSH principles
* National OSH regulations
* Company OSH and recording protocols, procedures and policies/guidelines
* Training and/or counselling methodologies and strategies

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency | Assessment requires evidence that the candidate:   1. Identified hazards in the workplace based their indicators 2. Evaluated workplace hazards based on legal requirements. 3. Addressed OSH concerns raised by workers as per legal requirements. 4. Implemented hazard prevention and control measures as per legal requirement. 5. Conducted risk assessment as per legal requirement. 6. Developed risk matrix based on likely impact. 7. Recognized and established contingency measures in accordance with organization procedures. 8. Identified, evaluated and reviewed company OSH program based on legal requirements. 9. Implemented company OSH programs as per legal requirements. 10. Capacity built workers on OSH standards and procedures as per legal requirements 11. Maintained OSH-related records as per legal requirements. |
| 1. Resource Implications | The following resources should be provided:   1. Access to relevant workplace where assessment can take place 2. Appropriately simulated environment where assessment can take place |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   1. Observation 2. Oral questioning 3. Written test 4. Portfolio of Evidence 5. Interview 6. Third party report |
| 1. Context of Assessment | Competency may be assessed:   1. On-the-job 2. Off-the –job 3. During Industrial attachment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# COMMON UNITS OF COMPETENCY

## PREPARE AND INTERPRET TECHNICAL DRAWINGS

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

**UNIT DESCRIPTION**

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

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT**  These describe the key outcomes that make up workplace function. | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements.  ***(Bold and italicized terms are elaborated in the Range)*** |
| --- | --- |
| 1. Use and maintain drawing equipment and materials | * 1. ***Drawing equipment*** are identified and gathered according to task requirements   2. ***Drawing materials*** are identified and gathered according to task requirements   3. Drawing equipment are used and maintained as per manufacturer’s instructions   4. Drawing materials are used as per workplace procedures   5. Waste materials are disposed in accordance with workplace procedures and ***environmental legislations***   6. ***Personal Protective Equipment*** is used according to occupational safety and health regulations |
| 1. Produce plain geometry drawings | * 1. Different types of lines used in drawing and their meanings are identified according to standard drawing conventions   2. Different types of ***geometric forms*** are constructed according to standard drawing conventions   3. Different types of angles are constructed according to principles of trigonometry   4. Different types of angles are measured using appropriate measuring tools   5. Angles are bisected according to standard drawing conventions   6. Sketches and drawings of patterns are interpreted according to standard conventions   7. Patterns are developed in accordance with standard conventions |
| 1. Produce pictorial and orthographic drawings of components | * 1. Different symbols and abbreviations are identified and their meaning interpreted according to standard drawing conventions   2. Isometric sketches and drawings of components are interpreted and produced in accordance with the standard conventions of isometric drawings   3. First and third angle orthographic sketches and drawings of components are interpreted and produced in accordance with the standard conventions of orthographic drawings   4. Freehand sketching of different types of geometric forms, tools, equipment, diagrams and components is conducted |
| 1. Produce assembly drawings | * 1. Orthographic views are exploded according to standard conventions of orthographic drawings.   2. Pictorial views are exploded according to standard conventions of orthographic drawings.   3. Part lists are identified according to part to be produced   4. Sectional views are produced according to standard conventions of drawing.   5. Produced drawing is hatched according to standard conventions of drawings. |
| 1. Apply CAD packages in drawing | * 1. CAD packages are selected according to task requirements   2. CAD packages are applied in production of plant machine parts. |

**RANGE**

| **Variable** | **Range** |
| --- | --- |
| 1. Drawing equipment may include but is not limited to: | * Drawing boards * T-square * Set squares * Drawing set * Computers with CAD packages |
| 1. Drawing materials may include but is not limited to: | * Drawing papers * Pencils * Erasers * Masking tapes * Paper clips |
| 1. Environmental legislations may include but is not limited to: | * EMCA 1999 |
| 1. Personal Protective Equipment may include but is not limited to: | * Dust coats * Closed leather shoes * Goggles for CAD |
| 1. Geometric forms may include but is not limited to: | * Circles * Triangles * Rectangles * Parallelogram * Polygons * Pyramids * Conic sections * Prisms * Loci |
| 1. Standard drawing conventions may include but is not limited to: | * Anatomy of engineering drawing (title block, coordinate grid system, revision block, notes and legends) * Drawing scale (paper size and drawing symbols) * International drawing standards |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required skills**

The individual needs to demonstrate the following skills:

* Critical thinking
* Drawing
* Interpretation
* Drawing equipment handling
* Analysis and synthesis
* Communication
* Inter personal

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Drawing equipment and materials
* Freehand sketching
* Lettering
* Geometrical constructions
* Types of drawings
* Types of lines
* Isometric drawing conventions, features, characteristics, components
* Orthographic drawing conventions, features, characteristics, components
* Sketches and drawings of simple patterns

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and understanding and range.

|  |  |  |
| --- | --- | --- |
| 1. Critical Aspects of Competency | | Assessment requires evidence that the candidate:   * 1. Applied and adhered to safety procedures   2. Cared and maintained drawing equipment   3. Interpreted technical diagrams   4. Applied appropriate technical standards, used proper tools and equipment for a given task   5. Produced sketches and drawings   6. Applied CAD packages in production of drawings |
| 1. Resource Implications | Resources the same as that of workplace are advised to be applied.   * 1. Drawing room   2. Drawing equipment and materials   3. Computers   4. CAD packages   5. PPE | |
| 1. Methods of Assessment | Competency may be assessed through:   * 1. Practical tests   2. Observation   3. Written tests | |
| 1. Context of Assessment | Competency may be assessed individually in the actual workplace or a simulated work place setting or during industrial attachment | |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. | |

## APPLY ENGINEERING MATHEMATICS

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

**UNIT DESCRIPTION:**

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

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT**  These describe the key outcomes which make up workplace function. | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the Range.*** |
| --- | --- |
| * 1. Apply Algebra | * 1. Calculations involving Indices are performed as per the concept   2. Calculations involving Logarithms are performed as per the concept   3. Scientific calculator is used in solving mathematical problems in line with manufacturer’s manual   4. Simultaneous equations are performed as per the rules   5. Quadratic equations are calculated as per the concept   6. Permutations and combinations are performed |
| * 1. Apply Trigonometry and hyperbolic functions | * 1. Calculations are performed using trigonometric rules   2. Calculations are performed using hyperbolic functions |
| * 1. Apply complex numbers | 3.1 Complex numbers are represented using Argand diagrams  3.2 Operations involving complex numbers are performed  3.3 Calculations involving complex numbers are performed using De Moivre’s theorem |
| * 1. Apply Coordinate Geometry | * 1. Polar equations are calculated using coordinate geometry   2. Graphs of given polar equations are drawn using the Cartesian plane   3. Normal and tangents are determined using coordinate geometry |
| * 1. Carry out Binomial Expansion | * 1. Roots of numbers are determined using binomial theorem   2. Errors of small changes are determined using binomial theorem |
| * 1. Apply Calculus | * 1. Derivatives of functions are determined using Differentiation   2. Derivatives of hyperbolic functions are determined using Differentiation   3. Derivatives of inverse trigonometric functions are determined using Differentiation   4. Rate of change and small change are determined using Differentiation.   5. Calculation involving stationery points of functions of two variables are performed using differentiation.   6. Integrals of algebraic functions are determined using integration   7. Integrals of trigonometric functions are determined using integration   8. Integrals of logarithmic functions are determined using integration   9. Integrals of hyperbolic and inverse functions are determined using integration |
| * 1. Solve Ordinary differential equations | * 1. First order and second order differential equations are solved using the method of undetermined coefficients   7.2 First order and second order differential equations are solved from given boundary conditions |
| * 1. Carry out Mensuration | * 1. Perimeter and areas of figures are obtained   2. Volume and Surface area of solids are obtained   3. Area of irregular figures are obtained   4. Areas and volumes are obtained using Pappus theorem |
| * 1. Apply Power Series | * 1. Power series are obtained using Taylor’s Theorem   2. Power series are obtained using McLaurin’s ‘s theorem |
| * 1. Apply Statistics | * 1. Mean, median, mode and Standard deviation are obtained from given data   2. Calculations are performed based on Laws of probability   3. Calculation involving ***probability distributions*,** mathematical expectation sampling distributions are performed   4. Sampling distribution methods are applied in data analysis   5. Calculations involving use of standard normal table, sampling distribution, T-distribution and Estimation are done   6. Confidence intervals are determined |
| * 1. Apply Numerical methods | * 1. Roots of polynomials are obtained using iterative ***numerical methods***   2. Interpolation and extrapolation is performed using numerical methods |
| * 1. Apply Vector theory | * 1. Vectors and scalar quantities are obtained in two and three dimensions   2. ***Operations*** on vectors are performed   3. Position of vectors is obtained   4. Resolution of vectors is done |
| * 1. Apply Matrix | * 1. Determinant and inverse of 3x3 matrix are obtained   2. Solutions of simultaneous equations are obtained   3. Calculation involving Eigen values and Eigen vectors are performed |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Operations may include but is not limited to: | * + Addition   + Subtraction |
| 1. Hyperbolic functions may include but is not limited to: | * + Sinh x   + Cosh x   + Cosec x   + Coth x   + Tanh x   + Sech x |
| 1. Probability Distributions may include but is not limited to: | * + Binomial   + Poisson   + Normal |
| 1. Numerical Methods may include but is not limited to: | * + Newton Raphson   + Gregory Newton |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Applying fundamental operations (addition, subtraction, division, multiplication)
* Using and applying mathematical formulas
* Logical thinking
* Problem solving
* Applying statistics
* Drawing graphs
* Using different measuring tools

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Fundamental operations (addition, subtraction, division, multiplication)
* Calculating area and volume
* Types and purpose of measuring instruments
* Units of measurement and abbreviations
* Rounding techniques
* Types of fractions
* Types of tables and graphs
* Presentation of data in tables and graphs
* Vector operations
* Matrix operations

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| * 1. Critical aspects of Competency | Assessment requires evidence that the candidate:   1. Applied Trigonometry and hyperbolic functions 2. Applied complex numbers 3. Applied Calculus 4. Solved Ordinary differential equations 5. Carried out mensuration 6. Applied Power Series 7. Applied vectors 8. Applied numerical methods 9. Applied statistics |
| * 1. Resource Implications | The following resources should be provided:   * 1. Access to relevant workplace or appropriately simulated environment where assessment can take place   2. Measuring equipment   3. Materials relevant to the proposed activity or tasks |
| * 1. Methods of Assessment | Competency in this unit may be assessed through:   * 1. Direct Observation   2. Demonstration with Oral Questioning   3. Written tests |
| * 1. Context of Assessment | Competency may be assessed individually in the actual workplace or through accredited institution or during industrial attachment |
| * 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## APPLY MECHANICAL SCIENCE PRINCIPLES

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

**UNIT DESCRIPTION**

This unit describes the competencies required by a spinning craft person to apply mechanical science principles in their work. It includes determining forces in a system, demonstrating knowledge of moments, understanding friction principles, understanding motions in engineering, describing work, energy and power, performing machine calculations, demonstrating gas principles, applying heat knowledge, applying density knowledge and applying pressure principles.

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT**  These describe the key outcomes which make up workplace function. | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the Range.*** |
| --- | --- |
| 1. Determine forces in a system | * 1. Forces are defined and described   2. ***Forces theorems*** are described   3. Resultant of coplanar forces are determined. |
| 1. Demonstrate knowledge of moments | * 1. Moments are defined   2. Moments are calculated   3. Principles of moments are described   4. Couples are identified and applied in engineering systems. |
| 1. Understand friction principles | * 1. Laws of friction are identified   2. Limiting friction is calculated   3. Forces applied at an angle to a horizontal plane are calculated   4. Coefficient of friction is calculated   5. Advantages and disadvantages of friction are identified. |
| 1. Understand motions in engineering | * 1. Motion concepts are discussed   2. Laws of motion are identified   3. Motion calculations are performed   4. Displacement/time graphs are applied |
| 1. Describe work, energy and power | * 1. Work is calculated   2. Energy is calculated   3. Power calculations are performed |
| 1. Perform machine calculations | * 1. ***Problems on simple machines*** are solved   2. Problems on levers are solved   3. Laws of machines are identified |
| 1. Demonstrate gas principles | * 1. ***Gas laws*** are identified   2. Gas laws are applied in solving engineering problems   3. Uses of gases in engineering systems are identified |
| 1. Apply heat knowledge | * 1. Heat concepts are discussed   2. Working principle of heat is defined   3. Heat capacity is discussed   4. Heat problems are solved |
| 1. Apply density knowledge | * 1. ***Density terminology*** are discussed   2. Density measurements are carried out   3. Density problems are solved |
| 1. Apply pressure principles | * 1. Pressure concepts are discussed   2. Working principles of pressure is discussed   3. Pressure problems are solved   4. ***Pressure applications*** are identified |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Forces theorems may include but is not limited to: | * + Parallelogram   + Triangle   + Polygon |
| 1. Problems on simple machines may include but is not limited to: | * + Machine advantage   + Velocity ratio   + Efficiency |
| 1. Gas laws may include but is not limited to: | * + Boyles law   + Charles law   + Gas equation |
| 1. Density terminology may include but is not limited to: | * + Density   + Relative density |
| 1. Pressure applications may include but is not limited to: | * + Vacuum pump   + Hydraulic pump   + Hydrometers |
| 1. Principles may include but is not limited to: | * + Newton’s laws of motion   + Law of conservation of linear momentum   + Law of conservation of energy   + Archimedes’ principle |
| 1. Mechanical calculations may include but is not limited to: | * + Mechanical advantage   + Efficiency   + Torque   + Power/Energy   + Work done |
| 1. Laws of fluids may include but is not limited to: | * + Pascal’s principle   + Gas laws |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Apply basic mechanical formulas
* Use of basic mechanical machines
* Perform various unit conversions of mechanical quantities
* Basic mechanical systems design
* Mechanical machine operation
* Logical thinking
* Problem solving
* Applying statistics
* Drawing graphs
* Using different measuring tools

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Newton’s law
* Levers
* Gear trains
* Laws of conservation of energy
* Laws of friction
* Type of forces
* Thermodynamics
* Calculation of fluid pressure and flow rate
* Mechanical advantage and efficiency calculations
* Properties of materials
* Gas laws
* SI units of mechanical energy.
* Power transmission systems
* Parameters of fluid system
* Operation of mechanical machines
* Mechanical calculation of power, energy, work done, torque and safety factor
* Units of measurement, conversions and abbreviations

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical aspects of Competency | Assessment requires evidence that the candidate:   * 1. Determined forces in a system   2. Demonstrated knowledge of moments   3. Understood friction principles   4. Understood motions in engineering   5. Described work, energy and power   6. Performed machine calculations   7. Demonstrated gas principles   8. Applied heat knowledge   9. Applied density knowledge   10. Applied pressure principles |
| 1. Resource Implications | The following resources should be provided:   * 1. Access to relevant workplace or appropriately simulated environment where assessment can take place   2. Measuring tools and equipment   3. Sample materials to be tested |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   * 1. Direct Observation   2. Demonstration with Oral Questioning   3. Case studies   4. Written tests |
| 1. Context of Assessment | Competency may be assessed individually in the actual workplace or through accredited institution or during industrial attachment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## PERFORMS SIMPLE MACHINE MAINTENANCE AND SAFETY PROCEDURES

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

**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.

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT**  These describe the key outcomes which make up workplace function. | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the Range.*** |
| --- | --- |
| 1. Prepare cleaning tools, equipment and reagents | 1. Safety procedures and requirements are identified as per OSHA and manufactures’’ manuals 2. ***Protective gears*** are obtained as per standard safety procedures 3. ***Cleaning tools, equipment and reagents*** are identified according to standard maintenance procedures. 4. Machines for cleaning are identified according to ***standard maintenance schedules***/plan 5. Cleaning tools, equipment and reagents are selected as per cleaning requirements |
| 1. Carry out cleaning of spinning machines | 1. Cleaning procedures and requirements are obtained based on standard set procedures 2. Protective gears are worn based on safety procedures 3. Machine parts to be cleaned are identified to manufacturers’ manuals 4. Machine parts are cleaned as per set standard cleaning procedures 5. ***Dirt*** removed from the machine is disposed according to set standards procedures 6. Safety procedures and requirements are observed according to OSHA and manufactures’’ manuals |
| 1. Lubricate spinning machines | 1. Protective gears are worn based on safety procedures 2. Moveable machine parts are identified for lubrication according to the manufacturers’ manual 3. Lubricants are identified based on the manufacturers’ manual 4. Machine parts are lubricated according to manufactures’ set procedures and guidelines 5. Safety procedures and requirements are observed according to OSHA and manufactures’’ manuals |
| 1. Carry out simple machines setting | 1. Tools and equipment for machine setting are selected according to standard requirements 2. ***Machine settings*** are identified according to manufacturers’ manual 3. Machines are set as per the manufacturers’ manuals and process requirements 4. Test-running of the machine is carried out according to SOPs |
| 1. Document maintenance procedures | 1. ***Documentation tools*** are obtained based on standard set procedures 2. Maintenance works are documented are documented according to set standard maintenance procedures 3. Maintenance reports generated are shared as per standard maintenance requirements 4. Maintenance reports generated are stored as per standard maintenance procedures |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Protective gearmay include but is not limited to: | * + Overall   + Aprons   + Footwear   + Headgear   + Gloves   + Masks |
| 1. Cleaning tools, equipment and reagents may include but is not limited to: | * + Tools and equipment   + Dusting cloth/waste   + Brooms and brushes   + Reagents   + Oils and grease   + Acid |
| 1. standard maintenance schedules may include but is not limited to: | * + Daily   + Weekly   + Monthly   + Shiftily |
| 1. Cleaning procedures may include but is not limited to: | * + Dusting   + Blowing   + Oiling and greasing   + Wiping   + Sweeping |
| 1. Dirt may include but is not limited to: | * + Fly wastes   + Dusts   + Oils and greases |
| 1. Machine settings may include but is not limited to: | * + Gauges   + Drafts   + Twists   + Speeds |
| 1. Documentation tools may include but is not limited to: | * + Computers   + Stationary   + Internet   + Printers |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Communication
* Leadership
* Application of basic mechanical formula
* Use of basic machines in spinning
* Spinning machine operation
* Logical thinking
* Problem solving
* Supervisory
* Interpretation of technical/engineering drawing
* Using different maintenance tools and equipment

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Levers
* Gear trains
* Conservation of energy
* Type of forces
* Properties of materials
* Power transmission systems
* Parameters of fluid system
* Operation of spinning machines
* Units of measurement, conversions and abbreviations
* Simple setting of spinning machines
* Simple maintenance of spinning machines
* Safety precautions for machine and materials
* Spinning flow layout
* Parts and functions of spinning machines
* Maintenance report writing
* Cleaning tools, equipment and reagents

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical aspects of Competency | Assessment requires evidence that the candidate:   1. Prepared and selected cleaning tools, equipment and reagents 2. Carried out cleaning of spinning machines 3. Lubricated spinning machines 4. Applied safety procedures 5. Carried out simple machines setting 6. Documented maintenance procedures |
| 1. Resource Implications | The following resources should be provided:   1. Spinning machines 2. Maintenance tools, materials and equipment 3. Documentation tools, materials and equipment 4. Safety gear |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   * 1. Direct Observation   2. Oral   3. Practical   4. Project   5. Case studies   6. Written tests |
| 1. Context of Assessment | Competency may be assessed individually in the actual workplace or through accredited institution or during industrial attachment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## MANAGE SPINNING WASTES

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

**UNIT DESCRIPTION**

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

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT**  These describe the key outcomes which make up workplace function. | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the Range.*** |
| --- | --- |
| 1. Classify spinning wastes | * 1. ***Spinning wastes*** are identified as per the processing material and machine process   2. Spinning wastes are sorted according to set specified standards   3. Wastes are graded based on set standards   4. Spinning of wastes are stored according to set standards |
| 1. Determine usage and disposal for wastes | * 1. Spinning of wastes are obtained as per source and process   2. Analysis of wastes is carried out according to specified standards   3. Wastes are segregated based on quality standards   4. Usage of waste is identified according to process and product-end use requirement   5. ***Disposable waste*** are determined and disposed according to standard procedures |
| 1. Process spinning wastes | * 1. Safety waste handling procedures are determined and observed according to OSHA   2. ***Processing quality parameters*** are determined according to waste type   3. ***Application of waste*** is determined as per end product requirement   4. Mixing and blending ratios are determined according to end product requirement   5. Spinning waste is processed as per the process and product requirement |
| 1. Document spinning wastes | * 1. Documentation tools, materials and equipment are obtained as per the set requirements   2. Spinning waste report is generated according to set requirements   3. Spinning waste records are maintained according to set procedures and guidelines |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Spinning wastes may include but is not limited to: | * + Loose fibres   + Slivers   + Roving   + Yarns |
| 1. Disposable waste may include but is not limited to: | * + Non-lint   + Dust   + Foreign matter |
| 1. Processing parameters may include but is not limited to: | * + Length   + Fineness   + Trash content   + Cleanliness |
| 1. Application of waste may include but is not limited to: | * + Brooms   + Mops   + Manufacture of disposable non-woven materials   + Composite   + Blanket weft yarns   + Construction   + Composting |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Leadership
* Identification and segregation of textile raw materials
* Communication
* Mechanical machine operation
* Logical thinking
* Problem solving

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Spinning process
* Classification of wastes
* Types of wastes
* Application of waste
* Processing of spinning wastes
* Quality control
* Documentation

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical aspects of Competency | Assessment requires evidence that the candidate:   1. Determined and observed safety in waste handling 2. Classified spinning wastes 3. Determined usage and disposal for wastes 4. Processed spinning wastes 5. Documented spinning wastes |
| 1. Resource Implications | The following resources should be provided:   * 1. Spinning waste   2. Spinning machines   3. Documentation tools, materials and equipment   4. Analytical tools and equipment |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   * 1. Observation   2. Oral   3. Project   4. Practicals   5. Assignments   6. Case studies   7. Written tests |
| 1. Context of Assessment | Competency may be assessed individually in the actual workplace or through accredited institution or during industrial attachment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# CORE UNITS OF COMPETENCY

## TEST TEXTILE SPINNING MATERIALS

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

**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.

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT**  These describe the key  outcomes which make up  workplace function | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements  ***(Bold and italicized terms are elaborated in the Range)*** |
| --- | --- |
| 1. Identify textile fibre spinning material | * 1. Relevant information is obtained according to organization procedures   2. ***Textile materials*** are obtained according to test specifications.   3. Textile materials are sorted according to test specifications   4. Sorted textile materials are labelled according to test specifications. |
| 1. Set up textile yarn testing equipment | * 1. ***Textile testing equipment*** is identified and selected according to test specifications.   2. Textile testing equipment is cleaned according to manufacturer’s specifications.   3. Textile testing equipment is checked for functionality according to operational manual   4. Textile testing equipment is calibrated according to manufacturer’s manual.   5. Textile testing equipment status is reported according to set standard procedures   6. Textile testing equipment is set up according to test specifications. |
| 1. Test textile spinning material (Sliver and roving) | * 1. Textile samples are mounted on testing equipment according to test specifications   2. Atmospheric condition is monitored according to prescribed testing standards   3. Sample test is carried out according to SOPs   4. Actual ***test*** is performed according to job specifications   5. Test results are recorded according to set standard testing procedures   6. Tested samples are removed and disposed where applicable according to prescribed standards |
| 1. Document textile testing results | * 1. ***Documentation tools and equipment*** are obtained according test specifications   2. Tested samples are documented according to set standard testing procedures   3. Testing equipment and standards of test used are documented according to standard procedures   4. Conditions under which test was carried out is recorded according to standard procedures   5. Test results are recorded according to standard procedures   6. Technical report is generated according to standard procedures |
| 1. Interpret textile test results | 1. Technical report generated is obtained according to standard procedures 2. Organizational standards are obtained according to standard procedures 3. Test results are compared with set standard standards according to organizational procedures. 4. Textile test results are interpreted according to standard testing procedures. |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

| **Variable** | **Range** |
| --- | --- |
| 1. Textile materials may include but is not limited to: | * Fibres * Laps * Sliver * Roving * Yarns |
| 1. Textile testing equipment may include but is not limited to: | * Fibre length tester * Twist tester * Evenness tester * Tensile strength tester * Wrap reel * Weighing balance |
| 1. Tests may include but is not limited to: | * Twist * Length * Count * Fibre fineness * Uniformity/evenness |
| 1. Documentation tools and equipment may include but is not limited to: | * Computer and accessories * Printer * Stationery |

**REQUIRED KNOWLEDGE**

***The individual needs to demonstrate knowledge of:***

* Textile materials
* Textile testing equipment and machines
* Properties of textile materials
* Conditions for testing textile materials
* Safety
* Interpretation of test results
* Documentation
* Mathematics understanding
* Physics
* Textile reference standards

**REQUIRED SKILLS**

***The individual needs to demonstrate skills in:***

* Testing textile materials
* Identification of textile materials
* Operation of textile testing equipment
* Interpretation of test results
* Maintenance of testing equipment
* Troubleshooting
* House keeping
* Effective communication
* Application of safety procedures
* Energy conservation
* Good decision making
* Time management
* Report writing
* Record keeping

**EVIDENCE GUIDE**

This provides advice on assessment and must be in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency. | * 1. Identified textile materials   2. Operated textile testing equipment   3. Set up textile testing equipment   4. Performed textile materials testing   5. Documented testing results textile materials   6. Interpreted textile test results |
| 1. Resource Implications. | * 1. Textile testing equipment   2. Textile materials   3. Stationery   4. Textile testing reference standards   5. Computer and accessories |
| 1. Methods of Assessment. | ***Competency may be assessed through:***   * 1. Practical   2. Observation   3. Questionnaire   4. Case studies   5. Written examinations   6. Oral presentation |
| 1. Context of Assessment. | Competency may be assessed individually in an actual workplace or in work-simulated conditions within accredited institutions or during industrial attachment. |
| 1. Guidance information for assessment. | This unit may be assessed on an integrated basis with others within this occupational sector. |

## PERFORM SPINNING PREPARATORY OPERATIONS

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

**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.

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT**  These describe the key  outcomes which make up  workplace function | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements  ***(Bold and italicized terms are elaborated in the Range)*** |
| --- | --- |
| 1. Open textile bales | * 1. ***Textile bales*** are obtained according to standard procedures   2. Textile bales are identified according to job specification   3. ***Tools and equipment*** for opening textile bales are identified according to standard procedures   4. Textile bales are arranged according to work plan   5. Textile bales are plucked according to standard procedures   6. Opened textile fibres are fed to blow room line according to operations manual |
| 1. Clean textile fibres | * 1. Opened textile fibres are obtained according to standard procedures   2. Fibre cleaning tools and equipment are identified according to standard procedures   3. ***Cleaning mechanism*** is identified according to fibre trash contents   4. Textile fibres are cleaned according to job specification   5. ***Fibre trash contents*** are identified and categorized according to standard procedures   6. cleaning efficiency is documented according to standard procedures |
| 1. Mix textile fibres | * 1. Mixing order is obtained according to standard procedures   2. Mixing order instructions are interpreted according to job specification   3. Bales are arranged according to mixing order   4. Fibres are mixed according to job specifications   5. Mixing ratios are documented according to standard procedures |
| 1. Operate blow room machinery | * 1. Machine operation manuals are obtained according to standard procedures   2. Machine safety and operation procedures are observed according to OSH Act manufacturers’ manual   3. ***Blow room machinery*** are operated according to operation manual   4. Blow room machinery faults are identified and fixed where possible according to operation manual   5. Major faults are reported according to standard procedures   6. Housekeeping is observed according to standard standards   7. Blow room machinery operations are documented according to standard procedures |
| 1. Monitor blow room operation | * 1. Safety precautions according to OSH Act manufacturers’ manual   2. Blow room operation resources are allocated according to job specification   3. ***Quality parameters*** are controlled according to job specification and standards   4. Blow room operation process flow is monitored   5. Process non-conformity factors are identified and documented according to standard procedures |
| 1. Document blow room production | 1. Documentation tools are obtained according to standard procedures 2. Blow room quality control tests are documented according to standard procedures 3. Blow room production is documented according to standard procedures 4. Report is generated according to standard procedures |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

| **Range** | **Variable** |
| --- | --- |
| 1. Tools and equipment may include but is not limited to: | * Bale plucker * Wire cutter |
| 1. Textile bales may include but is not limited to: | * Polyester * Cotton * Viscose rayon * Wool |
| 1. Cleaning mechanism may include but is not limited to: | * Manual * Beaters |
| 1. Fibre trash contents may include but is not limited to: | * Metal * Leaves * Stick * Seed |
| 1. Blow room machinery may include but is not limited to: | * Bale opener * Mixers * Beaters * Condenser * Scutcher * Chute feed |
| 1. Quality parameters may include but is not limited to: | * Density * Evenness * Neps * Foreign material * Fibre stability * Relative humidity |

**REQUIRED KNOWLEDGE**

***The individual needs to demonstrate knowledge of:***

* Bale opening methods
* Mixing process
* Contaminated spinning material
* Cleaning methods
* Fibre bales arrangement
* Spinning material passage
* Contamination types
* Waste box machines
* Relative humidity
* Physical Properties of textile fibres
* Machines and operating procedures
* Interpretation of job instructions
* Documentation
* Mathematical techniques
* Physics
* Energy conservation
* Waste management
* Occupational health and safety practices

**REQUIRED SKILLS**

***The individual needs to demonstrate skills in:***

* Execute opening and mixing process
* Understand contamination removal process
* Examine bale order
* Observe spinning material
* Check sorters and material
* Types of waste
* Identification of textile materials
* Relative humidity monitoring and regulation
* Operation of textile preparatory machines
* Interpretation of job instructions
* Maintenance of textile preparatory machines
* Troubleshooting
* House keeping
* Effective communication
* Application of safety procedures
* Energy conservation
* Good decision making
* Time management
* Report writing
* Record keeping

**EVIDENCE GUIDE**

This provides advice on assessment and must be in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency. | * 1. Opened textile bales   2. Mixed textile fibres   3. Cleaned textile fibres   4. Operated blow room machinery   5. Monitored blow room operation   6. Documented blow room operation |
| 1. Resource Implications. | * 1. Spinning preparatory machines   2. Textile bales   3. Computers and accessories   4. Stationery   5. Textile packages   6. Material handling carriers/equipment   7. Cans |
| 1. Methods of Assessment. | ***Competency may be assessed through:***   * 1. Practical   2. Observation   3. Questionnaire   4. Case studies   5. Written examinations   6. Oral presentation |
| 1. Context of Assessment. | Competency may be assessed individually in an actual workplace or in work-simulated conditions within accredited institutions or during industrial attachment. |
| 1. Guidance information for assessment. | This unit may be assessed on an integrated basis with others within this occupational sector. |

## PERFORM CARDING OPERATIONS

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

**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, monitor carding process and document carding production.

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT**  These describe the key  outcomes which make up  workplace function | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements  ***(Bold and italicized terms are elaborated in the Range)*** |
| --- | --- |
| 1. Examine carding input material | * 1. Material reference standards are obtained according to standard procedures   2. Card feed material is obtained according to production process   3. Obtained ***blow room lap properties*** are examined according to reference standards   4. Card feed material properties are documented according to standard procedures |
| 1. Set up carding machine | * 1. Machine operation manual is obtained according to standard procedures   2. Necessary ***tools and consumables*** are obtained according to operation manual   3. Carding machine parameters are set up according to operation manual |
| 1. Operate carding machine | * 1. Machine operation manual is obtained according to standard procedures   2. Machine safety and operation procedures are observed according to OSH Act and manufacturers’ manual   3. Carding machine is operated according to operation manual   4. Carding faults are identified and rectified where possible according to operation manual   5. Major faults are reported according to standard procedures   6. Housekeeping is observed according to standard procedures   7. Carding operations are documented according to standard procedures |
| 1. Monitor carding process | * 1. Safety precautions are observed according to OSH Act and manufacturers’ manual   2. Carding operation resources are allocated according to job specification   3. ***Carding machine parameters*** are monitored according to operation manual   4. Quality parameters are controlled according to job specification and standards   5. Carding process flow is monitored   6. Counter readings are recorded according to organizational procedures   7. Process non-conformity factors are identified and documented according to standard procedures |
| 1. Document carding production | * 1. Documentation tools are obtained according to standard procedures   2. ***Carding quality control tests*** are documented according to standard procedures   3. Carding production is documented according to standard procedures   4. Report is generated according to set standard procedures |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

| **Range** | **Variable** |
| --- | --- |
| 1. Card feed material properties may include but is not limited to: | * Trash content * Evenness * Density * Micronaire value * Length * Weight * Wrapping |
| 1. Tool and consumables may include but is not limited to: | * Oil and grease * Spanners * Nuts * Bolts * Dusting Cloth * Gauges |
| 1. Carding machine parameters may include but is not limited to: | * Drum speed * Feed roll speed * Licker in speed * Cylinder speed * Flat speed. * Doffer speed * Wing setting * Delivery speed |
| 1. Carding quality control tests may include but is not limited to: | * Tensile strength * Evenness * Sliver uniformity * Neppiness |

**REQUIRED KNOWLEDGE**

***The individual needs to demonstrate knowledge of:***

* Carding cans and types
* Carding machine operation
* Material feeding in back zone
* Textile materials
* Physical Properties of textile
* Interpretation of job instructions
* Documentation
* Mathematical techniques
* Physics
* Occupational health and safety

**REQUIRED SKILLS**

***The individual needs to demonstrate skills in:***

* Ability to handle material
* Operate carding machine
* Identify and place material cans
* Identification of textile materials
* Interpretation of job instructions
* Troubleshooting
* Simple maintenance procedures
* House keeping
* Effective communication
* Application of safety procedures
* Energy conservation
* Good decision making
* Time management
* Report writing
* Record keeping
* Waste management

**EVIDENCE GUIDE**

This provides advice on assessment and must be in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency. | * 1. Examined carding input material   2. Set up carding machine   3. Operated carding machine   4. Monitored carding process   5. Documented carding production |
| 1. Resource Implications. | * 1. Textile fibres   2. Carding machines   3. Cans   4. Textile testing equipment   5. Documentation tools and equipment   6. Quality control tools   7. Computers and accessories   8. Textile material handling equipment |
| 1. Methods of Assessment. | ***Competency may be assessed through:***   * 1. Practical   2. Observation   3. Questionnaire   4. Case studies   5. Written examinations   6. Oral presentation   7. Project |
| 1. Context of Assessment. | Competency may be assessed individually in an actual workplace or in work-simulated conditions within accredited institutions or during industrial attachment. |
| 1. Guidance information for assessment. | This unit may be assessed on an integrated basis with others within this occupational sector. |

## PERFORM DRAWING OPERATIONS

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

**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.

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT**  These describe the key  outcomes which make up  workplace function | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements  ***(Bold and italicized terms are elaborated in the Range)*** |
| --- | --- |
| 1. Feed carded sliver | * 1. Carded sliver is obtained according to standard procedures   2. Carded sliver input capacity is determined as per set standard procedures   3. ***Carded sliver quality parameters*** are examined according to reference standards   4. Carded sliver is guided through the machine parts according to standard operating procedures |
| 1. Set up draw frame | * 1. Machine operation manual is obtained according to standard procedures   2. Necessary tools and consumables are obtained according to operation manual   3. Draw frame parameters are set up according to operation manual |
| 1. Operate draw frame | * 1. Machine operation manual is obtained according to standard procedures   2. Machine safety and operation procedures are observed according to OSH Act and manufacturers’ manual   3. Draw frame is operated according to operation manual   4. Draw frame faults are identified and rectified where possible according to operation manual   5. Major faults are reported according to standard procedures   6. Housekeeping is observed according to standard standards   7. Draw frame operations are documented according to standard procedures |
| 1. Monitor drawing process | * 1. Safety precautions are observed according to OSH Act and manufacturers’ manual   2. Draw frame operation resources are allocated according to job specifications   3. Quality parameters are controlled according to job specifications and standards   4. Draw frame process flow is monitored as per set standard procedures   5. Counter readings are recorded according to standard procedures   6. Process non-conformity factors are identified and documented according to standard procedures |
| 1. Document drawing production | * 1. Documentation tools are obtained according to standard procedures   2. ***Draw frame quality control tests*** are documented according to standard procedures   3. Draw frame production is documented according to standard procedures   4. Report is generated according to standard procedures |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

| **Variable** | **Range** |
| --- | --- |
| 1. Carded sliver quality parameters may include but is not limited to: | * Strength * Trash content * Fibre length * Neps * Evenness * Sliver count |
| 1. Draw frame parameters may include but is not limited to: | * Roller gauge * Drafting gear * Total draft * Number of draw frame passages * Break draft * Number of doublings * Fibre length * Delivery speed * Type of drafting * Drafting roller weighting |
| 1. Draw frame quality control tests may include but is not limited to: | * Tensile strength * Evenness * Sliver count * Production calculations * Production efficiency * Drafting waves |

**REQUIRED KNOWLEDGE**

***The individual needs to demonstrate knowledge of:***

* Material feeding in back zone
* Material feeding in draw frame creel
* Doubling
* Cleaning methods
* Draw frame operations
* Material care and handling
* Techniques of production efficiency
* Waste management
* Energy conservation
* Mathematical techniques
* Physics

**REQUIRED SKILLS**

***The individual needs to demonstrate skills in:***

* Placing can and material
* Identify and place material can
* Selecting material from cans
* Observe dust laden portion zone
* Perform trial run
* Completing task
* Report writing
* Quality control
* Production control
* Resource supervision
* Troubleshooting
* House keeping
* Effective communication
* Application of safety procedures
* Energy conservation
* Good decision making
* Time management
* Waste management
* Simple machine maintenance

**EVIDENCE GUIDE**

This provides advice on assessment and must be in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency. | * 1. Fed carded sliver   2. Set up draw frame   3. Operated draw frame   4. Monitored drawing process   5. Documented drawing production |
| 1. Resource Implications. | * 1. Slivers   2. Drawing machine   3. Material handling cans   4. Textile testing equipment   5. Documentation tools and equipment   6. Quality control tools   7. Computers and accessories   8. Textile material handling equipment   9. Stationery   10. Gauges |
| 1. Methods of Assessment. | ***Competency may be assessed through:***   * 1. Practicals s   2. Observation   3. Questionnaire   4. Case studies   5. Written examinations   6. Assignments   7. Projects   8. Oral presentation |
| 1. Context of Assessment. | Competency may be assessed individually in an actual workplace or in work-simulated conditions within accredited institutions or during industrial attachment. |
| 1. Guidance information for assessment. | This unit may be assessed on an integrated basis with others within this occupational sector. |

## PERFORM COMBING OPERATIONS

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

**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, monitor combing process and document combing production

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT**  These describe the key  outcomes which make up  workplace function | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements  ***(Bold and italicized terms are elaborated in the Range)*** |
| --- | --- |
| 1. Carry out comber lap forming process | * 1. Drawn silver is obtained according to standard procedures   2. Drawn silver quality parameters are examined according to reference standards   3. Lap Comber parameters are set according to operation manual   4. Drawn silvers are fed through the guides according to SOPs |
| 1. Creel drawn lap | * 1. Drawn lap is obtained according to standard procedures   2. Drawn lap quality parameters are examined according to reference standards   3. ***Comber parameters*** are set according to operation manual   4. Drawn lap is fed through the guides |
| 1. Perform sliver doubling | * 1. ***Combing inputs*** are obtained according to standard procedures   2. Combing input quality parameters are examined according to reference standard   3. Combing inputs are fed into the comber according to operation manual |
| 1. Operate combing machine | * 1. Machine operation manual is obtained according to standard procedures   2. Machine safety and operation procedures are observed according to OSH Act and manufacturers’ manual   3. Comber is operated according to operations’ manual   4. Comber faults are identified and fixed where possible according to operation manual   5. Major faults are reported according to standard procedures   6. Housekeeping is observed according to standard standards   7. Comber operations are documented according to standard procedures |
| 1. Monitor combing process | * 1. Safety precautions are observed according to OSH Act and manufactures’ manual   2. Comber operation resources are allocated according to job specification   3. Quality parameters are controlled according to job specification and standards   4. Combing process flow is monitored according set standard procedures   5. Counter readings are recorded according to standard procedures   6. Process non-conformity factors are identified and documented according to standard procedures |
| 1. Document combing production | * 1. Documentation tools are obtained according to standard procedures   2. ***Comber quality control tests*** are documented according to standard procedures   3. Combing production is documented according to standard procedures   4. Report is generated according to standard procedures |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

| **Variable** | **Range** |
| --- | --- |
| 1. Comber parameters may include but is not limited to: | * Detachment setting * Number of points on the combs * Depth penetration of top and bottom combs * Piecing * Type of feed * Number of feeding heads |
| 1. Combing inputs may include but is not limited to: | * Sliver lap |
| 1. Comber quality control tests may include but is not limited to: | * Fibre fineness * Fibre length * Moisture content * Noil content |

**REQUIRED KNOWLEDGE**

***The individual needs to demonstrate knowledge of:***

* Types of drawn sliver can
* Doubling mechanism
* Lap former operation
* Feeding zone
* Comber operations
* Comber noil removal and collection
* Documentation
* Mathematical understanding
* Physics
* Safety
* Power transmission elements

**REQUIRED SKILLS**

***The individual needs to demonstrate skills in:***

* Material handling
* Check doubling techniques
* Operate lap forming machine
* Feeding lap to comber
* Operating comber
* Identify comber noil
* Use of tools and equipment
* Troubleshooting
* House keeping
* Effective communication
* Application of safety procedures
* Energy conservation
* Good decision making
* Time management
* Report writing
* Record keeping
* Inventory management skills
* Supervisory management skills
* Quality control skills

**EVIDENCE GUIDE**

This provides advice on assessment and must be in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency. | * 1. Performed comber lap forming operations   2. Creeled drawn sliver   3. Performed sliver doubling   4. Operated combing machine   5. Monitored combing process   6. Documented combing productions |
| 1. Resource Implications. | * 1. Slivers   2. Comber laps   3. Combing machine   4. Cans   5. Textile testing equipment   6. Documentation tools and equipment   7. Quality control tools   8. Computers and accessories   9. Textile material handling equipment   10. Stationery |
| 1. Methods of Assessment. | ***Competency may be assessed through:***   * 1. Practicals s   2. Observation   3. Questionnaire   4. Case studies   5. Written examinations   6. Oral presentation   7. Projects   8. Assignments |
| 1. Context of Assessment. | Competency may be assessed individually in an actual workplace or in work-simulated conditions within accredited institutions or during industrial attachment. |
| 1. Guidance information for assessment. | This unit may be assessed on an integrated basis with others within this occupational sector. |

## PERFORM FINISHER DRAWING OPERATIONS

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

**UNIT DESCRIPTION**

This unit describes the competencies required by a spinning craft charge hand to 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

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT**  These describe the key  outcomes which make up  workplace function | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements  ***(Bold and italicized terms are elaborated in the Range)*** |
| --- | --- |
| 1. Feed combed/drawn sliver | * 1. Combed/drawn sliver is obtained according to standard procedures   2. ***Combed/drawn sliver quality parameters*** are examined according to reference standards   3. Combed/drawn sliver is guided through the machine parts according to standard operating procedures |
| 1. Set up finisher draw frame | * 1. Machine operation manual is obtained according to standard procedures   2. Necessary ***tools and consumables*** are obtained according to operation manual   3. ***Finisher draw frame parameters*** are set up according to operation manual |
| 1. Operate finisher draw frame | * 1. Machine operation manual is obtained according to standard procedures   2. Machine safety and operation procedures are observed according to OSH Act and manufacturers’ manual   3. Finisher draw frame is operated according to operation manual   4. Finisher draw frame faults are identified and rectified where possible according to operation manual   5. Major faults are reported according to standard procedures   6. Housekeeping is observed according to standard standards   7. Finisher draw frame operations are documented according to standard procedures |
| 1. Monitor finisher drawing process | * 1. Safety precautions are observed according to OSH Act and manufacturers’ manual   2. Finisher draw frame operation resources are allocated according to job specification   3. Quality parameters are controlled according to job specification and standards   4. Finisher draw frame process flow is monitored   5. Counter readings are recorded according to organizational procedures   6. Process non-conformity factors are identified and documented according to standard procedures |
| 1. Document finisher drawing production | * 1. Documentation tools are obtained according to standard procedures   2. ***Finisher draw frame quality control tests*** are documented according to standard procedures   3. Finisher draw frame production is documented according to standard procedures   4. Report is generated according to standard procedures |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

| **Variable** | **Range** |
| --- | --- |
| 1. Combed/drawn sliver quality parameters may include but is not limited to: | * Strength * Trash content * Fibre length * Neps * Counts * Drafting waves |
| 1. Finisher draw frame parameters may include but is not limited to: | * Roller gauge * Drafting gear * Total draft * Number of draw frame passages * Break draft * Main draft |
| 1. Finisher draw frame quality control tests may include but is not limited to: | * Tensile strength * Evenness * Nepiness * Count |

**REQUIRED KNOWLEDGE**

***The individual needs to demonstrate knowledge of:***

* Material feeding in back zone
* Material feeding in draw frame creel
* Doubling
* Cleaning methods
* Draw frame operations
* Material care and handling
* Techniques of production efficiency
* Waste management
* Energy conservation
* Mathematical techniques
* Physics

**REQUIRED SKILLS**

***The individual needs to demonstrate skills in:***

* Identify and place material can
* Selecting material from cans
* Observe dust laden portion zone
* Perform trial run
* Completing task
* Report writing
* Quality control
* Production control
* Resource supervision
* Troubleshooting
* House keeping
* Effective communication
* Application of safety procedures
* Energy conservation
* Good decision making
* Simple machine maintenance
* Time management

**EVIDENCE GUIDE**

This provides advice on assessment and must be in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency. | * 1. Fed combed/drawn sliver   2. Set up finisher draw frame   3. Operated finisher draw frame   4. Monitored finisher drawing process   5. Documented finisher drawing production |
| 1. Resource Implications. | * 1. Slivers   2. Finisher drawing machine   3. Cans   4. Textile testing equipment   5. Documentation tools and equipment   6. Quality control tools   7. Computers and accessories   8. Textile material handling equipment   9. Stationery |
| 1. Methods of Assessment. | ***Competency may be assessed through:***   * 1. Practical   2. Observation   3. Questionnaire   4. Case studies   5. Written examinations   6. Assignments   7. Projects   8. Oral presentation |
| 1. Context of Assessment. | Competency may be assessed individually in an actual workplace or in work-simulated conditions within accredited institutions or during industrial attachment. |
| 1. Guidance information for assessment. | This unit may be assessed on an integrated basis with others within this occupational sector. |

## PERFORM SPEEDFRAME OPERATIONS

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

**UNIT DESCRIPTION**

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

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT**  These describe the key  outcomes which make up  workplace function | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements  ***(Bold and italicized terms are elaborated in the Range)*** |
| --- | --- |
| 1. Creel drawn sliver | * 1. Drawn sliver is obtained according to standard procedures   2. Drawn sliver quality parameters are examined according to reference standards   3. Drawn sliver is fed through the guides |
| 1. Set up speedframe machine | * 1. Machine operation manual is obtained according to standard procedures   2. Necessary ***tools and consumables*** are obtained according to operation manual   3. ***Speedframe machine parameters*** are set up according to operation manual |
| 1. Operate speedframe machine | * 1. Machine operation manual is obtained according to standard procedures   2. Machine safety and operation procedures are observed according to OSH Act   3. Speedframe machine is operated according to operation manual   4. Speedframe machine faults are identified and fixed where possible according to operation manual   5. Major faults are reported according to standard procedures   6. Housekeeping is observed according to standard standards   7. Roving operations are documented according to standard procedures |
| 1. Monitor roving process | * 1. Safety precautions according to OSH Act   2. Roving operation resources are allocated according to job specification   3. Quality parameters are controlled according to job specification and standards   4. Roving process flow is monitored as per job specifications   5. Counter readings are recorded according to organizational procedures   6. Process non-conformity factors are identified and documented according to standard procedures |
| 1. Document roving production | * 1. Documentation tools are obtained according to standard procedures   2. ***Roving quality control tests*** are documented according to standard procedures   3. Roving production is documented according to standard procedures   4. Report is generated according to standard procedures |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

| **Variable** | **Range** |
| --- | --- |
| 1. Tools and consumables may include but is not limited to: | * Oil and Grease * Spanner * Pliers * Gauges |
| 1. Speedframe machine parameters may include but is not limited to: | * Front roller speed * Break draft * Traveller type and speed * Spindle speed * Main draft * Total draft * Twist level |
| 1. Roving quality parameters may include but is not limited to: | * Linear density * Fiber fineness * Fiber length * Blend ratio * Roving gauge |

**REQUIRED KNOWLEDGE**

***The individual needs to demonstrate knowledge of:***

* Can creeling
* Previous doff
* Roving insertion in flyer
* Machine processes
* Piecing operation
* Material placement
* Documentation
* Mathematical understanding
* Physics
* Safety
* Power transmission elements
* Waste management

**REQUIRED SKILLS**

***The individual needs to demonstrate skills in:***

* Identify can in respect to material
* Use bobbin as per requirement
* Insert roving in flyer and wind in presser arm
* Perform trial run
* Perform proper piecing
* Ability to stack material as per identification
* Operate speed frame machine
* Trouble shooting skills
* Use of tools and equipment
* Troubleshooting
* House keeping
* Effective communication
* Application of safety procedures
* Energy conservation
* Good decision making
* Time management
* Report writing
* Record keeping
* Simple machine maintenance

**EVIDENCE GUIDE**

This provides advice on assessment and must be in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency. | * 1. Creeled drawn sliver   2. Set up speedframe machine   3. Operated speedframe machine   4. Monitored roving process   5. Documented roving production.   6. Proper storage of maintenance records |
| 1. Resource Implications. | * 1. Slivers   2. Speedframe machine   3. Cans   4. Textile testing equipment   5. Documentation tools and equipment   6. Quality control tools   7. Computers and accessories   8. Textile material handling equipment   9. Stationery |
| 1. Methods of Assessment. | ***Competency may be assessed through:***   * 1. Practical   2. Observation   3. Questionnaire   4. Case studies   5. Written examinations   6. Oral presentation   7. Projects   8. Assignments |
| 1. Context of Assessment. | Competency may be assessed individually in an actual workplace or in work-simulated conditions within accredited institutions or during industrial attachment. |
| 1. Guidance information for assessment. | This unit may be assessed on an integrated basis with others within this occupational sector. |

## PERFORM RING SPINNING OPERATIONS

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

**UNIT DESCRIPTION**

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

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT**  These describe the key outcomes which make up  workplace function | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements  ***(Bold and italicized terms are elaborated in the Range)*** |
| --- | --- |
| 1. Feed material bobbin on spinning machine | * 1. Feed material is obtained according to standard procedures   2. ***Feed material quality parameters*** are examined according to reference standards   3. Feed material is guided through the machine parts according to standard operating procedures |
| 1. Set up spinning machine | * 1. Machine operation manual is obtained according to standard procedures   2. Necessary ***tools and consumables*** are obtained according to operation manual   3. ***Spinning machine parameters*** are set up according to operation manual |
| 1. Operate spinning machine | * 1. Machine operation manual is obtained according to standard procedures   2. Machine safety and operation procedures are observed according to OSH Act   3. Spinning machine is operated according to operation manual   4. Spinning machine faults are identified and rectified where possible according to operation manual   5. Major faults are reported according to standard procedures   6. Housekeeping is observed according to standard standards   7. Spinning machine operations are documented according to standard procedures |
| 1. Monitor spinning process | * 1. Safety precautions are identified according to OSH Act and manufacture’s procedures.   2. Spinning machine operation resources are allocated according to job specification   3. Quality parameters are controlled according to job specification and standards   4. Spinning machine process flow is monitored   5. Counter readings are recorded according to organizational procedures   6. Process non-conformity factors are identified and documented according to standard procedures |
| 1. Document ring spinning production | * 1. Documentation tools are obtained according to standard procedures   2. ***Spinning machine quality control tests*** are documented according to standard procedures   3. Spinning machine production is documented according to standard procedures   4. Report is generated according to standard procedures |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

| **Variable** | **Range** |
| --- | --- |
| 1. Feed material quality parameters may include but is not limited to: | * Strength * Trash content * Fibre length * Neps * count |
| 1. Spinning machine parameters may include but is not limited to: | * Roller gauge * Drafting gear * Speed * Twist gear * Drafting rollers * Strength |
| 1. Spinning machine quality control tests may include but is not limited to: | * Tensile * Yarn evenness * Yarn twist * Yarn count * Yarn hairiness |

**REQUIRED KNOWLEDGE**

***The individual needs to demonstrate knowledge of:***

* Creeling
* Feeding points
* Cleaning points
* Feeding techniques
* Accurate traveler number
* Machine operation
* Piecing techniques
* Doffing techniques
* Material care
* Safety
* Techniques of production efficiency
* Waste management
* Energy conservation
* Yarn faults and winding faults
* Mathematical understanding
* Physics
* Waste management

**REQUIRED SKILLS**

***The individual needs to demonstrate skills in:***

* Identify feed material with respect to material
* Feed the material
* Cleaning drafting zone properly
* Use proper bobbins colour
* Place the traveler
* Operate the machine
* Ability to piece the material
* Perform doffing
* Handle the material properly
* Report writing
* Quality control
* Production control
* Resource supervision
* Troubleshooting
* House keeping
* Effective communication
* Application of safety procedures
* Energy conservation
* Good decision making
* Time management
* Simple maintenance procedures

**EVIDENCE GUIDE**

This provides advice on assessment and must be in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency. | * 1. Fed material bobbin on spinning machine   2. Set up spinning machine   3. Operated spinning machine   4. Monitored spinning process   5. Documented spinning production |
| 1. Resource Implications. | * 1. Feed material   2. Ring spinning machine   3. Cans   4. Textile testing equipment   5. Documentation tools and equipment   6. Quality control tools   7. Computers and accessories   8. Textile material handling equipment   9. Stationery |
| 1. Methods of Assessment. | ***Competency may be assessed through:***   * 1. Practicals   2. Observation   3. Questionnaire   4. Case studies   5. Written examinations   6. Assignments   7. Projects   8. Oral presentation |
| 1. Context of Assessment. | Competency may be assessed individually in an actual workplace or in work-simulated conditions within accredited institutions or during industrial attachment. |
| 1. Guidance information for assessment. | This unit may be assessed on an integrated basis with others within this occupational sector. |

## PERFORM CONE WINDING

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

**UNIT DESCRIPTION**

This unit describes the competencies required by a spinning craft charge hand to 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

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT**  These describe the key  outcomes which make up  workplace function | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements  ***(Bold and italicized terms are elaborated in the Range)*** |
| --- | --- |
| 1. Feed ring bobbin on winding unit | * 1. yarn spindles are obtained according to standard procedures   2. ***spun yarn quality parameters*** are examined according to reference standards   3. Feed material is guided through the machine parts according to standard operating procedures |
| 1. Operate cone winding machine | * 1. Machine operation manual is obtained according to standard procedures   2. Machine safety and operation procedures are observed according to OSH Act and manufacturers’ manual   3. Cone winding machine is operated according to operation manual   4. Cone winding faults are identified and rectified where possible according to operation manual   5. Major faults are reported according to standard procedures   6. Housekeeping is observed according to standard standards   7. Cone winding is documented according to standard procedures |
| 1. Stack doffed cones | * 1. Doffing instructions are obtained according to standard procedures   2. ***Doffed cones quality parameters*** are inspected according to reference standards   3. Fully doffed cones are removed from cone winding machines according to standard procedures   4. Fully doffed cones are transported to storage area according to standard procedures   5. Fully doffed cones are stacked according to standard procedures   6. Stacking doffed cones are documented according to standard procedures |
| 1. Perform yarn conditioning and packaging | * 1. Reference standards are obtained according to standard procedures   2. Conditioning room/machine are set according to reference standards   3. Cones/yarns for conditioning are obtained according to standard procedures   4. Cones/yarns are conditioned according to reference standards   5. Conditioned cones/yarns are wrapped according to standard procedures   6. Conditioned cones/yarns are packaged according to standard procedures   7. Cone/yarn conditioning and packaging are documented according to standard procedures |
| 1. Document cone winding production | * 1. Documentation tools are obtained according to standard procedures   2. ***Cone winding quality control tests*** are documented according to standard procedures   3. Cone winding production is documented according to standard procedures   4. Report is generated according to standard procedures |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

| **Variable** | **Range** |
| --- | --- |
| 1. Spun yarn quality parameters may include but is not limited to: | * Tensile strength * Yarn evenness * Yarn twist * Yarn count * Yarn hairiness |
| 1. Cone winding quality control tests may include but is not limited to: | * Spun yarn winding distribution * Density |
| 1. Doffed cones quality parameters may include but is not limited to: | * Uniformity * Density * Evenness |

**REQUIRED KNOWLEDGE**

***The individual needs to demonstrate knowledge of:***

* Cone placement
* Cones conditioning time and humidity
* Cone packing
* Customer care
* Safety
* Techniques of production efficiency
* Waste management
* Energy conservation
* Yarn faults and winding faults
* Mathematical understanding
* Physics

**REQUIRED SKILLS**

***The individual needs to demonstrate skills in:***

* Stack cones properly
* Conditioning efficiency
* Packed material properly
* Packed cones as per requirement
* Report writing
* Resource supervision
* Troubleshooting
* House keeping
* Effective communication
* Application of safety procedures
* Energy conservation
* Good decision making
* Time management
* Simple machine maintenance

**EVIDENCE GUIDE**

This provides advice on assessment and must be in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency. | * 1. Fed ring bobbin on winding unit   2. Operated cone winding machine   3. Stacked doffed cones   4. Performed yarn conditioning and packaging   5. Documented cone winding production |
| 1. Resource Implications. | * 1. Bobbin   2. Spindle   3. Winding unit   4. Packaging material   5. Conditioning room   6. Conditioning equipment   7. Cans   8. Textile testing equipment   9. Documentation tools and equipment   10. Quality control tools   11. Computers and accessories   12. Textile material handling equipment   13. Stationery |
| 1. Methods of Assessment. | ***Competency may be assessed through:***   * 1. Practicals   2. Observation   3. Questionnaire   4. Case studies   5. Written examinations   6. Assignments   7. Projects   8. Oral presentation |
| 1. Context of Assessment. | Competency may be assessed individually in an actual workplace or in work-simulated conditions within accredited institutions or during industrial attachment. |
| 1. Guidance information for assessment. | This unit may be assessed on an integrated basis with others within this occupational sector. |

## PERFORM DOUBLING AND TWISTING OPERATIONS

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

**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.

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT**  These describe the key outcomes which make up workplace function. | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the Range.*** |
| --- | --- |
| 1. Feed yarn on the doubling/twisting machine | 1. Safety precautions are observed according to OSHA and manufacturers’ manual 2. ***Doubling/twisting machines*** are identified based on process requirements 3. Yarn is fed onto doubling/twisting machine according to SOPs 4. Doubling/twisting machine is operated |
| 1. Set-up doubling/twisting machine | 1. Machine operation manual is obtained as per set procedures 2. Necessary ***tools and consumables*** are obtained according to set standard procedures 3. ***Machine parameters*** are set according to manufacturers’ operational manual and process materials. |
| 1. Operate doubling/twisting machine | 1. Machine operation is obtained according to the set procedures 2. Machine safety procedures are observed according to OSH Act and manufacture’s manual 3. Machines are operated according to manufacturers’ operation manual 4. Machine faults are identified and rectified according to operational manual 5. Housekeeping is observed according to set standard procedures 6. Machine operations are documented according set standard procedures |
| 1. Monitor doubling/twisting process | 1. Safety precautions are observed according to OSH Act and manufacturers’ manual 2. Machine operation resources are allocated according to job specifications 3. Quality parameters are controlled according to job specifications and standards 4. Machine process flow is monitored as per set standard procedures 5. Counter readings are recorded according to standard procedures 6. Process non-conformity factors are identified and documented according to standard procedures |
| 1. Document doubling/twisting production | * 1. Documentation tools are obtained according to standard procedures   2. ***Quality control tests results*** are documented according to standard procedures   3. Machine production is documented according to standard procedures   4. Report is generated according to standard procedures |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

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| **Variable** | **Range** |
| 1. Doubling/twisting machines may include but is not limited to: | * + Ring twisters   + Two for one twister   + Cone/cheese winder |
| 1. Tools and consumables may include but is not limited to: | * + Yarns   + Gauges   + Tachometers   + Stroposcope |
| 1. Quality control tests results may include but is not limited to: | * Tensile strength * Evenness * Yarn count * Production calculations * Production efficiency |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Identification of feed material
* Feed the material
* Operate the machine
* Ability to piece the material
* Perform doffing
* Report writing
* Quality control
* Production control
* Resource utilization
* Troubleshooting
* House keeping
* Effective communication
* Application of safety procedures
* Energy conservation
* Good decision making
* Time management
* Simple maintenance procedures

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Creeling
* Feeding points
* Cleaning points
* Feeding techniques
* Machine operation
* Knotting techniques
* Doffing techniques
* Material care
* Safety
* Techniques of production efficiency
* Waste management
* Energy conservation
* Yarn and winding faults
* Waste management
* Production calculations

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

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| 1. Critical Aspects of Competency. | 1. Fed yarn on the doubling/twisting machine 2. Set-up doubling/twisting machine 3. Operated doubling/twisting machine 4. Monitored doubling/twisting process 5. Documented doubling/twisting production |
| 1. Resource Implications. | * 1. Cone/cheese   2. Spindle   3. Winding unit   4. Packaging material   5. Textile testing equipment   6. Documentation tools and equipment   7. Quality control tools   8. Computers and accessories   9. Textile material handling equipment   10. Stationery |
| 1. Methods of Assessment. | ***Competency may be assessed through:***   * 1. Practical   2. Observation   3. Case studies   4. Written examinations   5. Assignments   6. Projects   7. Oral |
| 1. Context of Assessment. | Competency may be assessed individually in an actual workplace or in work-simulated conditions within accredited institutions or during industrial attachment. |
| 1. Guidance information for assessment. | This unit may be assessed on an integrated basis with others within this occupational sector. |