



# **COMPETENCY STANDARD FOR INDUSTRIAL ENGINEERING AND LEAN MANUFACTURING**

**Level: 4**

**(RMG & Textile Sector)**

**Competency Standard Code: CS-RMGT-IELM-L4-EN-V1**



**National Skills Development Authority  
Prime Minister's Office  
Government of the People's Republic of Bangladesh**



## Copyright

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This Competency Standard for Industrial Engineering and Lean Manufacturing is a document for the development of curricula, teaching and learning materials, and assessment tools. It also serves as the document for providing training consistent with the requirements of industry in order to meet the qualification of individuals who graduated through the established standard via competency-based assessment for a relevant job.

This document has been developed by NSDA in association with RMG and Textile Sector, industry representatives, academia, related specialist, trainer and related employee.

Public and private institutions may use the information contained in this standard for activities benefitting Bangladesh.

## Introduction

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The NSDA aims to enhance an individual's employability by certifying completeness with skills. NSDA works to expand the skilling capacity of identified public and private training providers qualitatively and quantitatively. It also aims to establish and operationalize a responsive skills ecosystem and delivery mechanism through a combination of well-defined set of mechanisms and necessary technical supports.

Key priority economic growth sectors identified by the government have been targeted by NSDA to improve current job skills along with existing workforce to ensure required skills to industry standards. Training providers are encouraged and supported to work with industry to address identified skills and knowledge to enable industry growth and increased employment through the provision of market responsive inclusive skills training program. "**Industrial Engineering and Lean Manufacturing**" is selected as one of the priority occupations of RMG and Textile Sector. This standard is developed to adopt a demand driven approach to training with effective inputs from Industry Skills Councils (ISC's), employer associations and employers.

Generally, a competency standard informs curriculum, learning materials, assessment and certification of trainees enrolled in Skills Training. Trainees who successfully pass the assessment will receive a qualification in the National Skills Qualification Framework (BNQF) under Bangladesh National Qualification Framework and will be listed on the NSDA's online portal.

This competency standard is developed to improve skills and knowledge in accordance with the job roles, duties and tasks of the occupation and ensure that the required skills and knowledge are aligned to industry requirements. A series of stakeholder consultations, workshops were held to develop this document.

The document also details the format, sequencing, wording and layout of the Competency Standard for an occupation which is comprised of Units of Competence and its corresponding Elements.

## Overview

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A competency standard is a written specification of the knowledge, skills and attitudes required for the performance of an occupation, trade or job corresponding to the industry standard of performance required in the workplace.

The purpose of a competency standards is to:

- provide a consistent and reliable set of components for training, recognising and assessing people's skills, and may also have optional support materials
- enable industry recognised qualifications to be awarded through direct assessment of workplace competencies
- encourage the development and delivery of flexible training which suits individual and industry requirements
- encourage learning and assessment in a work-related environment which leads to verifiable workplace outcomes

Competency standards are developed by a working group comprised of representative from NSDA, Key Institutions, ISC, and industry experts to identify the competencies required of an occupation in RMG and Textile Sector.

Competency standards describe the skills, knowledge and attitude needed to perform effectively in the workplace. CS acknowledge that people can achieve technical and vocational competency in many ways by emphasizing what the learner can do, not how or where they learned to do it.

With competency standards, training and assessment may be conducted at the workplace or at training institute or any combination of these.

Competency standards consist of a number of units of competency. A unit of competency describes a distinct work activity that would normally be undertaken by one person in accordance with industry standards.

Units of competency are documented in a standard format that comprises of:

- unit title
- nominal duration
- unit code
- unit descriptor
- elements and performance criteria
- variables and range statement
- curricular content guide
- assessment evidence guide

Together, all the parts of a unit of competency:

- describe a work activity
- guide the assessor to determine whether the candidate is competent or not yet competent

The ensuing sections of this document comprise of a description of the relevant occupation, trade or job with all the key components of a unit of competency, including:

- a chart with an overview of all Units of Competency for the relevant occupation, trade or job including the Unit Codes and the Unit of Competency titles and corresponding Elements
- the Competency Standard that includes the Unit of Competency, Unit Descriptor, Elements and Performance Criteria, Range of Variables, Curricular Content Guide and Assessment Evidence Guide.

**Competency Standards for National Skill Certificate, Level-4 in  
Industrial Engineering and Lean Manufacturing in RMG and Textile Sector**

**Level Descriptors of BNQF (1-6)**

Level & Job classification	Knowledge Domain	Skills Domain	Responsibility Domain
6-Mid-Level Manager/ Sub Assistant Engineer	Comprehensive actual and theoretical knowledge within a specific work or study area with an awareness of the validity and limits of that knowledge, able to analyse, compare, relate and evaluate.	Specialised and wider range of cognitive and practical skills required to provide leadership in the development of creative solutions to defined problems. Communicate professional issues and solutions to the team and to external partners/users.	Work under broad guidance and self-motivation to execute strategic and operational plan/s. Lead lower-level management. Diagnose and resolve problems within and among work groups.
5-Supervisor	Broad knowledge of the underlying, concepts, principles, and processes in a specific work or study area, able to scrutinize and break information into parts by identifying motives or causes.	Broad range of cognitive and practical skills required to generate solutions to specific problems in one or more work or study areas. Communicate practice-related problems and possible solutions to external partners.	Work under guidance of management and self-direction to resolve specific issues. Lead and take responsibility for the work and actions of group/team members. Bridge between management.
4-Highly Skilled Worker	Broader knowledge of the underlying, concepts, principles, and processes in a specific work or study area, able to solve problems to new situations by comparing and applying acquired knowledge.	A range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying the full range of methods, tools, materials and information. Communicate using technical terminology and IT technology with partners and users as per workplace requirements.	Work under minimal supervision in specific contexts in response to workplace requirements. Resolve technical issues in response to workplace requirements and lead/guide a team/ group.
3-Skilled Worker	Moderately broad knowledge in a specific work or study area, able to perceive ideas and abstract from drawing and design according to workplace requirements.	Basic cognitive and practical skills required to use relevant information in order to carry out tasks and to solve routine problems using simple rules and tools. Communicate with his team and limited external partners upholding the values, nature and culture of the workplace	Work or study under supervision with considerable autonomy. Participate in teams and responsible for group coordination.
2-Semi Skilled Worker	Basic understanding of underpinning knowledge in a specific work or study area, able to interpret and apply common occupational terms and instructions.	Skills required to carry out simple tasks, communicate with his team in the workplace presenting and discussing results of his work with required clarity.	Work or study under supervision in a structured context with limited scope of manipulation
1 –Basic Skilled Worker	Elementary understanding of ability to interpret the underpinning knowledge in a specific study area, able to interpret common occupational terms and instructions.	Specific Basic skills required to carry out simple tasks. Interpret occupational terms and present the results of own work within guided work environment/ under supervision.	Work under direct supervision in a structured context with limited range of responsibilities.

## List of Abbreviations

CS	Competency Standard
ISC	Industry Skills Council
NSDA	National Skills Development Authority
BNQF	National Skills Qualifications Framework
OSH	Occupational Safety and Health
PPE	Personal Protective Equipment
SCVC	Standards and Curriculum Validation Committee
STP	Skills Training Provider
SOP	Standard Operating Procedure
UoC	Unit of Competency





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**Competency Standards for National Skill Certificate, Level-4 in  
Industrial Engineering and Lean Manufacturing in RMG and Textile Sector**

**Course Structure**

SL No	Unit code and Title		UOC Level	Nominal (hours)
Generic Units of Competencies				
1.	GU-02-L1-V1	Apply Occupational Safety and Health (OSH) Procedure in the Workplace	1	15
2.	GU-04-L3-V1	Lead Small Team	3	20
Sub Total				35
Sector Specific Units of Competencies				
3.	SU-RMGT-01-L2-V1	Recognize the RMG Business Scenario	2	15
4.	SU-RMGT-02-L3-V1	Interpret Drawing and Specifications in Manuals for the RMG Industries	2	30
Sub Total				45
Occupation Specific Units of Competencies				
5.	OU-RMGT-IELM-01-L3-V1	Interpret Basic Garments Construction	4	35
6.	OU-RMGT-IELM-02-L3-V1	Illustrate Garments Operations	4	25
7.	OU-RMGT-IELM-03-L3-V1	Interpret Work Study Techniques	4	60
8.	OU-RMGT-IELM-04-L3-V1	Interpret Lean and lean quality concepts	4	25
9.	OU-RMGT-IELM-05-L3-V1	Identify Tools for Lean Manufacturing	4	55
10.	OU-RMGT-IELM-06-L3-V1	Interpret Production Planning and Control	4	45
11.	OU-RMGT-IELM-07-L3-V1	Perform Optimization Techniques in Different Department	4	35
Sub Total				280
Total Duration				360

## Units & Elements at Glance

### Generic Competencies

Code	Unit of competency	Elements of competency	Duration (hours)
GU-02-L1-V1	Apply Occupational Safety and Health (OSH) Procedure in the Workplace	<ol style="list-style-type: none"><li>1. Identify OSH policies and procedures</li><li>2. Follow OSH procedure</li><li>3. Report hazards and risks</li><li>4. Respond to emergencies</li><li>5. Maintain personal well-being</li></ol>	15
GU-04-L3-V1	Lead Small Team	<ol style="list-style-type: none"><li>1. Provide team leadership</li><li>2. Assign responsibilities</li><li>3. Set performance expectations for team members</li><li>4. Supervise team performance</li></ol>	20
<b>Total Hours</b>			<b>35</b>

## Sector specific competencies

Code	Unit of competency	Elements of competency	Duration (hours)
SU-RMGT-01-L2-V1	Recognize the RMG Business Scenario	<ol style="list-style-type: none"> <li>1. Identify Basic Business Communication Practices in RMG sector</li> <li>2. Recognize history of RMG industries in Bangladesh</li> <li>3. Identify major departments of RMG industry</li> <li>4. List prime Export Markets</li> </ol>	15
SU-RMGT-02-L3-V1	Interpret Drawing and Specifications in Manuals for the RMG Industries	<ol style="list-style-type: none"> <li>1. Identify information from manual</li> <li>2. Identify drawing and specifications</li> <li>3. Interpret drawing and specifications</li> <li>4. Store manuals</li> </ol>	30
<b>Total hours</b>			<b>45</b>

## Occupation specific competencies

Code	Unit of competency	Elements of competency	Duration (hours)
OU-RMGT-IELM-01-L3-V1	Interpret Basic Garments Construction	<ol style="list-style-type: none"> <li>1. Comprehended process from fibres to finished garments</li> <li>2. Identify functions of industrial sewing machine and attachment</li> <li>3. Identify stitch and seam on garments style</li> <li>4. List clothing materials used for garments</li> </ol>	35
OU-RMGT-IELM-02-L3-V1	Illustrate Garments Operations	<ol style="list-style-type: none"> <li>1. Interpret garments operation breakdown</li> <li>2. Apply line layout on styling</li> </ol>	25
OU-RMGT-IELM-03-L3-V1	Interpret Work Study Techniques	<ol style="list-style-type: none"> <li>1. Identify method study and work measurement</li> <li>2. Perform Standard Minute Value (SMV) / Standard Allocated Minute (SAM) calculation</li> <li>3. Perform production capacity and target calculation</li> <li>4. Perform efficiency calculation</li> <li>5. Practice skill matrix on workers performance</li> </ol>	60
OU-RMGT-IELM-04-L3-V1	Interpret Lean and lean quality concepts	<ol style="list-style-type: none"> <li>1. Interpret lean concept</li> <li>2. Interpret lean quality concept</li> <li>3. Interpret quality activities and garments defects</li> </ol>	25
OU-RMGT-IELM-05-L3-V1	Identify Tools for Lean Manufacturing	<ol style="list-style-type: none"> <li>1. Interpret lean manufacturing concept</li> <li>2. Interpret tools and techniques of lean manufacturing</li> <li>3. Perform KAIZEN event</li> </ol>	55
OU-RMGT-IELM-06-L3-V1	Interpret Production Planning and Control	<ol style="list-style-type: none"> <li>1. Interpret Time and Action (TNA) plan</li> <li>2. Perform plant capacity calculations</li> <li>3. Identify inventory planning</li> <li>4. Perform production scheduling</li> </ol>	45
OU-RMGT-IELM-07-L3-V1	Perform Optimization Techniques in Different Department	<ol style="list-style-type: none"> <li>1. Interpret industrial setup and layout</li> <li>2. Perform utilization of clothing material</li> <li>3. Perform process optimization</li> </ol>	35
<b>Total Hours</b>			<b>280</b>

## **Generic Units of Competencies**

<b>Unit Code and Title</b>	<b>GU-02-L1-V1: Apply Occupational Safety and Health (OSH) Procedure in the Workplace</b>
<b>Unit Descriptor</b>	<p>This unit covers the knowledge, skills and attitudes (KSA) required in applying occupational safety and health (OSH) procedures in the workplace.</p> <p>It specifically includes identifying OHS policies and procedures, following OSH procedure, reporting to emergencies, and maintaining personal well-being.</p>
<b>Nominal Hours</b>	<b>15 Hours</b>
<b>Elements of Competency</b>	<b>Performance Criteria</b> <u><b>Bold &amp; Underlined</b></u> terms are elaborated in the Range of Variables
1. Identify OSH policies and procedures.	1.1. <u><b>OHS policies</b></u> and <u><b>safe operating procedures</b></u> are accessed and stated. 1.2. <u><b>Safety signs and symbols</b></u> are identified and followed. 1.3. Emergency response, evacuation procedures and other contingency measures are determined according to workplace requirements.
2. Follow OSH procedure	2.1 <u><b>Personal protective equipment (PPE)</b></u> is selected and collected as required. 2.2 Personal protective equipment (PPE) is correctly used in accordance with organization OHS procedures and practices. 2.3 A clear and tidy workplace is maintained as per workplace standard. 2.4 PPE is maintained to keep them operational and compliant with OHS regulations.
3. Report hazards and risks.	3.1 <u><b>Hazards</b></u> and risks are identified, assessed and controlled. 3.2 Incidents arising from hazards and risks are reported to designated authority.
4. Respond to emergencies	4.1 Alarms and warning devices are responded. 4.2 Workplace <u><b>emergency procedures</b></u> are followed. 4.3 <u><b>Contingency measures</b></u> during workplace accidents, fire and other emergencies are recognized and followed in accordance with organization procedures. 4.4 First aid procedures is applied during emergency situations.
5. Maintain personal well-being	5.1 OHS policies and procedures are adhered to. 5.2 OHS awareness programs are participated in as per workplace guidelines and procedures. 5.3 Corrective actions are implemented to correct unsafe condition in the workplace. 5.4 <u><b>“Fit to work” records</b></u> are updated and maintained according to workplace requirements.
<b>Range of Variables</b>	
<b>Variables</b>	<b>Range</b> (may include but not limited to):
1. OHS Policies	1.1. Bangladesh standards for OHS 1.2. Fire Safety Rules and Regulations 1.3. Code of Practice 1.4. Industry Guidelines



2. Safe Operating Procedures	2.1 Orientation on emergency exits, fire extinguishers, fire escape, etc. 2.2 Emergency procedures 2.3 First Aid procedures 2.4 Tagging procedures 2.5 Use of PPE 2.6 Safety procedures for hazardous substances
3. Safety Signs and symbols	3.1 Direction signs (exit, emergency exit, etc.) 3.2 First aid signs 3.3 Danger Tags 3.4 Hazard signs 3.5 Safety tags 3.6 Warning signs
4. Personal Protective Equipment (PPE)	4.1 Gas Mask 4.2 Gloves 4.3 Safety boots 4.4 Face mask 4.5 Overalls 4.6 Goggles and safety glasses 4.7 Sun block 4.8 Chemical/Gas detectors
5. Hazards	5.1 Chemical hazards 5.2 Biological hazards 5.3 Physical Hazards 5.4 Mechanical and Electrical Hazard 5.5 Mental hazard 5.6 Ergonomic hazard
6. Emergency Procedures	6.1 Fire fighting 6.2 Earthquake 6.3 Medical and first aid 6.4 evacuation`
7. Contingency measures	7.1 Evacuation 7.2 Isolation 7.3 Decontamination
8. "Fit to Work" records	8.1 Medical Certificate every year 8.2 Accident reports, if any 8.3 Eye vision certificate

### **Evidence Guide**

The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency

1. Critical aspects of competency	Assessment required evidence that the candidate: 1.1 stated OHS policies and safe operating procedures 1.2 followed safety signs and symbols 1.3 used personal protective equipment (PPE) 1.4 maintained workplace clear and tidy 1.5 assessed and Controlled hazards 1.6 followed emergency procedures 1.7 followed contingency measures 1.8 implemented corrective actions
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2. Underpinning knowledge	2.1 Define OHS 2.2 OHS Workplace Policies and Procedures 2.3 Work Safety Procedures 2.4 Emergency Procedures 2.5 Hazard control procedure 2.6 Different types of Hazards 2.7 PPE and their uses 2.8 Personal Hygiene Practices 2.9 OHS Awareness
3. Underpinning skills	3.1 Accessing OHS policies 3.2 Handling of PPE 3.3 Handling cleaning tools and equipment 3.4 Writing report 3.5 Responding to emergency procedures
4. Required attitude	4.1 Commitment to occupational health and safety 4.2 Sincere and honest to duties 4.3 Promptness in carrying out activities 4.4 Environmental concerns 4.5 Eagerness to learn 4.6 Tidiness and timeliness 4.7 Respect of peers and seniors in workplace 4.8 Communicate with peers and seniors in workplace
5. Resource implications	5.1 Workplace 5.2 Equipment and outfits appropriate in applying safety measures 5.3 Tools, materials and documentation required 5.4 OHS Policies and Procedures
6. Methods of assessment	Competency should be assessed by: 6.1 Written test 6.2 Demonstration 6.3 Oral Questioning 6.4 Portfolio
7. Context of assessment	7.1 Competency assessment must be done in NSDA accredited assessment centre 7.2 Assessment should be done by a NSDA certified/nominated assessor

### **Accreditation Requirements**

Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.

<b>Unit Code and Title</b>	<b>GU-04-L3-V1: Lead Small Team</b>
<b>Unit Descriptor</b>	This unit covers the knowledge, skills and attitudes required to lead small team. It specifically includes – provide team leadership; assign responsibilities; set performance expectations for team members; and supervised team performance.
<b>Nominal Hours</b>	<b>20 Hours</b>
<b>Elements of Competency</b>	<b>Performance Criteria</b> <b><u>Bold underlined</u></b> terms are elaborated in the Range of Variables
1. Provide team leadership	<p>1.1 <b><u>Work requirements</u></b> are identified and presented to team members.</p> <p>1.2 Reasons for instructions and requirements are communicated to team members.</p> <p>1.3 <b><u>Team members' queries and concerns</u></b> are recognized, discussed and dealt with.</p>
2. Assign responsibilities	<p>2.1 Duties, and responsibilities are allocated having regard to the skills, knowledge and attitudes required to properly undertake the assigned task</p> <p>2.2 Duties are allocated having regard to individual preference, domestic and personal considerations, whenever possible</p>
3. Set performance expectations for team members	<p>3.1 Performance expectations are established based on client needs and according to assignment requirements.</p> <p>3.2 Performance expectations are based on individual team members' duties and area of responsibility.</p> <p>3.3 Performance expectations are discussed and directed to implement in the workplace.</p>
4. Supervise team performance	<p>4.1 <b><u>Monitoring of performance</u></b> are taken place against defined performance criteria and / or assignment instructions and corrective action taken if required.</p> <p>4.2 Team members are provided <b><u>feedback</u></b>, positive support and advice on strategies to overcome any deficiencies.</p> <p>4.3 <b><u>Performance issues</u></b> which cannot be rectified or addressed within the team are referenced to appropriate personnel.</p> <p>4.4 Team members are kept informed of any changes in the priority allocated to assignments or tasks which might impact on clients' / customers' needs and satisfaction.</p> <p>4.5 Team operations are monitored to ensure that employer / client needs and requirements are met.</p> <p>4.6 Follow-up communication is provided on all issues affecting the team.</p> <p>4.7 All relevant documentation is completed.</p>
<b>Range of Variables</b>	
<b>Variable</b>	<b>Range</b> (may include but not limited to):

1. Work requirements	1.1 Client Profile 1.2 Assignment instructions
2. Team member's queries and concerns	2.1 Roster 2.2 Shift details
3. Monitoring of performance	3.1 Formal process 3.2 Informal process
4. Feedback	4.1 Formal process 4.2 Informal process 4.3 Sandwich process
5. Performance issues	5.1 Work output 5.2 Work quality 5.3 Team participation 5.4 Compliance with workplace protocols 5.5 Safety 5.6 Customer service
<b>Evidence Guide</b> The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency.	
1. Critical aspects of competency	Assessment required evidence that the candidate: 1.1 Maintained or improved individuals and / or team performance given a variety of possible scenario 1.2 Assessed and monitored team and individual performance against set criteria 1.3 Represented concerns of a team and individual to next level of management or appropriate specialist and to negotiate on their behalf 1.4 Allocated duties and responsibilities, having regard to individual's knowledge, skills and aptitude and the needs of the tasks to be performed 1.5 Set and communicated performance expectations for a range of tasks and duties within the team and provided feedback to team members
2. Underpinning Knowledge	2.1 Company policies and procedures 2.2 Relevant legal requirements 2.3 How performance expectations are set 2.4 Methods of monitoring performance 2.5 Client expectations 2.6 Team members' duties and responsibilities
3. Underpinning Skills	3.1 Counselling informal performance skills 3.2 Building team skills 3.3 Negotiating skills.

4. Underpinning attitude	4.1 Commitment to occupational health and safety 4.2 Promptness in carrying out activities 4.3 Sincere and honest to duties 4.4 Eagerness to learn 4.5 Tidiness and timeliness 4.6 Environmental concerns 4.7 Respect for rights of peers and seniors in workplace 4.8 Communicate with peers and seniors in workplace
5 Resource implications	The following resources must be provided: 5.1 Workplace (actual or simulated) 5.2 Tools, equipment and facilities appropriate to processes or activity 5.3 Materials relevant to the proposed activity 5.4 Equipment and outfits appropriate in applying safety measures 5.5 Relevant drawings, manuals, codes, standards and reference material
6. Methods of assessment	Methods of assessment may include but not limited to: 6.1 Written test 6.2 Demonstration 6.3 Oral questioning
7 Context of assessment	7.1 Competency assessment must be done in NSDA accredited center. 7.2 Assessment should be done by NSDA certified/ nominated assessor
<b>Accreditation Requirements</b> Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.	

## **Sector Specific Units of Competencies**

<b>Unit Code and Title</b>	<b>SU-RMGT-01-L4-V1: Recognize the RMG Business Scenario</b>
<b>Unit Descriptor</b>	<p>This unit covers the knowledge, skill and attitude required to Recognize the RMG business scenario.</p> <p>It specifically includes the task of identifying basic business communication practices in RMG Sector, recognizing history of RMG industries in Bangladesh, identifying major departments of RMG industry and listing prime export markets.</p>
<b>Nominal Hours</b>	<b>15 Hours</b>
<b>Elements of Competency</b>	<b>Performance Criteria</b> ( <b><u>Bold and Underlined</u></b> terms are elaborated in the Range of Variables)
1. Identify basic business communication practices in RMG Sector	1.1 The communication requirements in the RMG sector are recognized in alignment to the role of RMG sector 1.2 <b><u>Modes of Communication</u></b> are explained 1.3 Communication policies and guidelines are identified and interpreted
2. Recognize history of RMG Industries in Bangladesh	2.1. <b><u>Background of RMG</u></b> Industries in Bangladesh is inferred with reference to the past history, present status and expected future trends 2.2. Importance of the RMG sector in relation to Bangladesh labour market is stated with emphasis on manpower and economic impact 2.3. Present and projected future trends and technologies relevant to the sector are summarized
3. Identify major departments of RMG Industry	1.6 Scope and nature of <b><u>major departments</u></b> of the RMG sector are identified 1.7 Role and responsibilities of individuals are identified in relation to the department and organization as a whole 1.8 The <b><u>machines</u></b> used in different departments are identified
4. List prime export markets	2.1 The types of <b><u>prime export markets</u></b> are categorized on the basis of their current and future potential 2.2 Export marketing process is interpreted
<b>Range of Variables</b>	
<b>Variable</b>	<b>Range</b> (may include but not limited to):
1. Modes of Communication	1.1 E-mail 1.2 Social Media 1.3 Telephonic Conversation 1.4 Fax 1.5 Meetings 1.6 Video Conference 1.7 Courier

2. Background of RMG	2.1 History of Bangladesh RMG 2.2 Economy of Bangladesh 2.3 SWOT analysis on RMG sector 2.4 Gender dynamics of garments industry in Bangladesh. 2.5 Wages & efficiency in the garments industry 2.6 Compliance
3. Major Departments	1.1 PDS 1.2 Store 1.3 Cutting 1.4 Embellishment 1.5 Sewing 1.6 Washing 1.7 Finishing 1.8 Quality 1.9 Industrial Engineering 1.10 Production Planning and Control 1.11 Maintenance 1.12 Merchandising
4. Machines	4.1 Single needle machine 4.2 Double needle Machine 4.3 Over lock Machine 4.4 Flat lock Machine 4.5 Feed of the arm Machine 4.6 Kansai Multi Needle Machine 4.7 Bar tuck Machine 4.8 Button Hole Machine 4.9 Button Stitch Machine 4.10 Snap Attach Machine
5. Prime export markets	5.1 American market 5.2 European market 5.3 Asian market 5.4 Newly explored market
<b>Evidence Guide</b> The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.	
1. Critical aspects of competency	Assessment required evidence that the candidate: 1.1 Identified mode Communication 1.2 Interpreted production process 1.3 Identified prime export markets
2. Underpinning knowledge	2.1. Policies and Guidelines 2.2. History of RMG sector 2.3. Trends in the RMG sector 2.4. Production process 2.5. Different Department in RMG sector 2.6. Own roles and responsibilities



	2.7. Types of prime export markets
3. Underpinning skills	3.1. Identifying policies and guidelines in RMG sector 3.2. Interpreting business communication technique 3.3. Interpreting trends of RMG sector 3.4. Identifying departments in RMG sector 3.5. Identifying machines used in different departments
4. Underpinning Attitudes	4.1. Commitment to occupational health and safety 4.2. Environmental concerns 4.3. Eagerness to learn 4.4. Tidiness and timeliness 4.5. Respect for rights of peers and seniors in workplace 4.6. Communication with peers and seniors in workplace
5. Resource implications	5.1. Tools, equipment and physical facilities appropriate to perform activities. 5.2. Materials, consumables to perform activities.
6. Methods of Assessment	6.1. Written test 6.2. Oral questioning 6.3. Demonstration
7. Context of Assessment	7.1. Competency assessment must be done in NSDA accredited centre. 7.2. Assessment should be done by NSDA certified/ nominated assessor.
<b>Accreditation Requirements</b> Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.	

<b>Unit Code and Title</b>	<b>SU-RMGT-02-L2-V1: Interpret Drawing and Specifications in Manuals for the RMG Industries</b>
<b>Unit Descriptor</b>	This unit covers the knowledge, skills and attitudes required to interpret drawing and specifications in manuals for RMG industries. It specifically includes – identify information from manuals; identify drawing and specifications; interpret drawings and specifications; and store manuals.
<b>Nominal Hours</b>	<b>30 Hours</b>
<b>Elements of Competency</b>	<b>Performance Criteria</b> ( <b><u>Bold and Underlined</u></b> terms are elaborated in the Range of Variables)
1. Identify information from manuals	1.1 Appropriate <b><u>manuals</u></b> are identified. 1.2 Version and date of manuals are checked to ensure up-to-date specifications of tools, equipment and materials.
2. Identify drawing and specifications	2.1 Relevant <b><u>drawing</u></b> and <b><u>specifications</u></b> are identified. 2.2 <b><u>Terms and abbreviation</u></b> are identified. 2.3 <b><u>Signs and symbols</u></b> are identified.
3. Interpret drawing and specifications	3.1 Drawing and specifications are interpreted. 3.2 Schedules, dimensions, and specifications contained in drawing are interpreted.
4. Store manuals	4.1 Documents are stored appropriately to prevent damage, ready access and updating of information when required.
<b>Range of Variables</b>	
<b>Variable</b>	<b>Range</b> (may include but not limited to):
1. Manuals	1.1 Manufacturer's Specification Manual 1.2 Repair Manual 1.3 Maintenance Procedure Manual 1.4 Periodic Maintenance Manual 1.5 Quality Manual 1.6 Manual of Instruction
2. Drawing	2.1 Technical Drawing 2.2 Sketch
3. Specifications	3.1 Products specifications 3.2 Performance specifications 3.3 Methods specifications
4. Terms and abbreviation	4.1 Refers to all terms and specifications associated with the construction sector
5. Sign and symbols	5.1 Include all sign and symbols associated with the construction sector
<b>Evidence Guide</b>	

The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.	
1. Critical aspects of competency	<p>Assessment required evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Interpreted drawings and specifications.</li> <li>1.2 Identified signs and symbols.</li> <li>1.3 Satisfied the requirements mentioned in the performance criteria and range of variables.</li> </ul>
2. Underpinning knowledge	<ul style="list-style-type: none"> <li>2.1 Types of RMG manuals.</li> <li>2.2 Identification of signs and symbols.</li> <li>2.3 Identification of units of measurement.</li> <li>2.4 Identification of units of conversion.</li> <li>2.5 Drawings and specifications.</li> <li>2.6 Terms and abbreviations used.</li> </ul>
3. Underpinning skills	<ul style="list-style-type: none"> <li>3.1 Identifying appropriate manuals.</li> <li>3.2 Identifying drawings and specifications.</li> <li>3.3 Interpreting drawings and specifications.</li> <li>3.4 Storing manuals.</li> </ul>
4. Underpinning Attitudes	<ul style="list-style-type: none"> <li>4.1 Commitment to occupational health and safety.</li> <li>4.2 Promptness in carrying out activities.</li> <li>4.3 Sincere &amp; honest to duties.</li> <li>4.4 Tidiness &amp; timeliness.</li> <li>4.5 Eagerness to learn.</li> <li>4.6 Environmental concerns.</li> <li>4.7 Respect for rights of peers and seniors at workplace.</li> <li>4.8 Communication with peers &amp; seniors at workplace.</li> </ul>
5. Resource implications	<ul style="list-style-type: none"> <li>5.1 Workplace (actual or simulated).</li> <li>5.2 Availability of all manuals.</li> <li>5.3 Accessibility of storage area.</li> <li>5.4 Instructions sheet.</li> <li>5.5 Module.</li> </ul>
6. Methods of Assessment	<ul style="list-style-type: none"> <li>6.1 Written test</li> <li>6.2 Oral questioning</li> <li>6.3 Demonstration</li> </ul>
7. Context of Assessment	<ul style="list-style-type: none"> <li>7.1 Competency assessment must be done in NSDA accredited centre.</li> <li>7.2 Assessment should be done by NSDA certified/ nominated assessor.</li> </ul>
<p><b>Accreditation Requirements</b></p> <p>Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.</p>	

## **Occupation Specific Units of Competencies**

<b>Unit Code and Title</b>	<b>OU-RMGT-IELM-01-L4-EN-V1: Interpret Basic Garments Construction</b>
<b>Unit Descriptor</b>	<p>This unit covers the knowledge, skills and attitudes required to interpret basic garments construction.</p> <p>It specifically includes – comprehend process from fibers to finished garments; identify functions of industrial sewing machine and attachment; identify stitch and seam on garments style; and list clothing materials used for garments.</p>
<b>Nominal Hours</b>	<b>35 Hours</b>
<b>Elements of Competency</b>	<p><b>Performance Criteria</b></p> <p><b><u>Bold &amp; Underlined</u></b> terms are elaborated in the Range of Variables</p>
1. Comprehend process from fibre to finished garments	<p>1.1 <b><u>Fabric manufacturing processes</u></b> are identified</p> <p>1.2 <b><u>Garments manufacturing processes</u></b> are identified</p> <p>1.3 Manufacturing steps are listed according to the type of garment to be manufactured.</p>
2. Identify functions of industrial sewing machine and attachment	<p>2.1 Types of <b><u>Industrial Sewing machines</u></b> are identified as per specification</p> <p>2.2 Functions of industrial sewing machines are interpreted as per specification</p> <p>2.3 Types of <b><u>attachments</u></b> are identified as per styling of garments.</p>
3. Identify stitch and seam on garments style	<p>3.1 <b><u>Types of Stitches</u></b> are identified as per garment style</p> <p>3.2 <b><u>Types of Seams</u></b> are identified as per garment style</p> <p>3.3 Garments stitch quality is interpreted as per sample</p> <p>3.4 Garments seam quality is interpreted as per sample</p>
4. List clothing materials used for garments	<p>4.1 <b><u>Types of Clothing materials</u></b> are identified</p> <p>4.2 Clothing materials are listed as per the BOM (Bill of Material) sheet.</p>
<b>Range of Variables</b>	
<b>Variables</b>	<b>Range (may include but not limited to):</b>
1. Fabric manufacturing process	<p>1.1 Fiber</p> <p>1.2 Yarn</p> <p>1.3 Woven fabric</p> <p>1.4 Knit fabric</p> <p>1.5 Dying, printing and finishing</p> <p>1.6 Yarn dyed fabrics</p>
2. Garments manufacturing process	<p>2.1 Design</p> <p>2.2 Pattern making</p> <p>2.3 Fit sample making</p> <p>2.4 Production pattern making</p> <p>2.5 Grading</p> <p>2.6 Marker making</p> <p>2.7 Fabric spreading</p>

	2.8 Fabric cutting parts numbering & bundling 2.9 Embellishment (Print and Embroidery) 2.10 Sewing 2.11 Washing 2.12 Garments finishing & packing
3. Industrial Sewing Machine	3.1 Lock Stitch machine 3.2 Chain Stitch machine 3.3 Over lock machine 3.4 Flat Lock machine 3.5 Feed of the arm machine 3.6 Multi needle machine 3.7 Blind stitch machine 3.8 Bar tack machine 3.9 Button hole machine 3.10 Button stitch machine 3.11 Eyehole / key hole machine
4. Attachments	4.1 Feed 4.2 Guide 4.3 Folder
5. Types of Stitch	5.1 Chain stitch 5.2 Lock stitch 5.3 Hand stitch
6. Types of Seam	6.1 Super imposed seam 6.2 French seam 6.3 Lapped seam 6.4 Lap felled seam 6.5 Bound seam 6.6 Flat seam 6.7 Decorative seam 6.8 Edge neatening seam
7. Types of clothing materials	7.1 Main materials: <ul style="list-style-type: none"> <li>• Yarn</li> <li>• Fabric</li> </ul> 7.2 Sub materials: 7.3 Trims & Accessories
<b>Evidence Guide</b> The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency	
1. Critical aspects of competency	Assessment required evidence that the candidate: <ol style="list-style-type: none"> <li>1.1 Listed steps of manufacturing process as per flow chart.</li> <li>1.2 Identified industrial sewing machine.</li> <li>1.3 Identified stitch &amp; seam quality as per sample.</li> <li>1.4 Recognized clothing materials.</li> <li>1.5 Illustrated major safety issues for RMG industries.</li> </ol>

2. Underpinning knowledge	2.1 Key steps of manufacturing process. 2.2 Types and functions of industrial sewing machine. 2.3 Differentiate between stitch and seam.
3. Underpinning skills	3.1 Listing steps of manufacturing process as per flow chart 3.2 Identifying industrial sewing machine 3.3 Identifying stitch quality as per sample 3.4 Recognizing clothing materials
4. Required attitude	4.1 Commitment to occupational health and safety 4.2 Promptness in carrying out activities 4.3 Sincere and honest to duties 4.4 Environmental concerns 4.5 Eagerness to learn 4.6 Tidiness and timeliness 4.7 Respect for rights of peers and seniors in workplace 4.8 Communication with peers and seniors in workplace
5. Resource implications	5.1 Workplace (actual or simulated). 5.2 Tools, equipment and physical facilities appropriate to perform activities. 5.3 Materials consumable to perform activities.
6. Methods of assessment	Competency should be assessed by: 6.1 Written test 6.2 Demonstration 6.3 Oral Questioning
7. Context of assessment	7.1 Competency assessment must be done in NSDA accredited assessment centre 7.2 Assessment should be done by a NSDA certified/nominated assessor
<b>Accreditation Requirements</b> Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.	

<b>Unit Code and Title</b>	<b>OU-RMGT-IELM-02-L4-EN-V1: Illustrate Garments Operation</b>
<b>Unit Descriptor</b>	<p>This unit covers the knowledge, skills and attitudes required to illustrate garments operation.</p> <p>It specifically includes – interpreting garments operation breakdown; and applying line layout on styling.</p>
<b>Nominal Hours</b>	<b>25 Hours</b>
<b>Elements of Competency</b>	<p><b>Performance Criteria</b></p> <p><b><u>Bold &amp; Underlined</u></b> terms are elaborated in the Range of Variables</p>
1. Interpret garments operation breakdown	<p>1.1 Garments operation breakdown is interpreted as per styling</p> <p>1.2 Garments operation breakdown is prepared as per sample shared by the client/buyer</p>
2. Apply line layout on styling	<p>2.1 Line layout is interpreted as per styling</p> <p>2.2 Line layout types are selected as per job requirement</p>
<b>Range of Variables</b>	
<b>Variables</b>	<b>Range</b> (may include but not limited to):
1. Garments operation breakdown	<p>1.1 Style of the garments</p> <p>1.2 Garment parts</p> <ul style="list-style-type: none"> <li>• Front part</li> <li>• Back part</li> <li>• Assembling part</li> </ul>
2. Line layout	<p>2.1 Operation breakdown</p> <p>2.2 Operation wise machine selection</p> <p>2.3 Operation wise operator selection</p> <p>2.4 Standard Minute Value (SMV) / Standard Allocated Minute (SAM)</p> <p>2.5 Line balancing information</p>
3. Layout types	<p>3.1 Straight layout</p> <p>3.2 Side by side machine layout</p> <p>3.3 U- shaped line layout</p> <p>3.4 Face to Face layout</p> <p>3.5 Modular line layout</p> <p>3.6 Progressive Bundle System (PBS)</p> <p>3.7 Unit Production System (UPS)</p>
<b>Evidence Guide</b>	
The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency	
1. Critical aspects of competency	<p>Assessment required evidence that the candidate:</p> <p>1.1 Demonstrated operation breakdown as per sample.</p> <p>1.2 Performed line layout as per styling.</p>



2. Underpinning knowledge	2.1 Techniques on garments operation breakdown 2.2 Types of layout 2.3 Line layout system as per job requirement
3. Underpinning skills	3.1 Demonstrating operation breakdown as per sample 3.2 Performing line layout as per styling
4 Required attitude	4.1 Commitment to occupational health and safety 4.2 Promptness in carrying out activities 4.3 Sincere and honest to duties 4.4 Environmental concerns 4.5 Eagerness to learn 4.6 Tidiness and timeliness 4.7 Respect for rights of peers and seniors in workplace 4.8 Communication with peers and seniors in workplace
5. Resource implications	5.1 Workplace (actual or simulated). 5.2 Tools, equipment and physical facilities appropriate to perform activities. 5.3 Materials consumable to perform activities
6. Methods of assessment	Competency should be assessed by: 6.1 Written test 6.2 Demonstration 6.3 Oral Questioning
7. Context of assessment	7.1 Competency assessment must be done in NSDA accredited assessment centre 7.2 Assessment should be done by a NSDA certified/nominated assessor
<b>Accreditation Requirements</b> Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.	

<b>Unit Code and Title</b>	<b>OU-RMGT-IELM-03-L4-EN-V1: Interpret Work Study Techniques</b>
<b>Unit Descriptor</b>	This unit covers the knowledge, skills and attitudes required to interpret work study techniques. It specifically includes – identify method study and work measurement; perform Standard Minute Value (SMV) calculation; perform production capacity and target calculation; perform efficiency calculation; and practice skill matrix on workers' performance.
<b>Nominal Hours</b>	<b>60 Hours</b>
<b>Elements of Competency</b>	<b>Performance Criteria</b> <b><u>Bold &amp; Underlined</u></b> terms are elaborated in the Range of Variables
1. Identify method study and work measurement	1.1 <b><u>Method study</u></b> are defined 1.2 <b><u>Procedures of method</u></b> study are identified 1.3 Work measurement are defined 1.4 <b><u>Work measurement techniques</u></b> are identified
2. Perform Standard Minute Value (SMV) / Standard Allocated Minute (SAM) calculation	2.1 <b><u>Tools for Standard Minute Value (SMV) / Standard Allocated Minute (SAM) calculation</u></b> are identified 2.2 Procedures of SMV /SAM calculation are comprehended as per plan 2.3 <b><u>SMV / SAM calculation formula</u></b> is interpreted 2.4 Error free SMV / SAM calculation is performed according to formula
3. Perform production capacity and target calculation	3.1 <b><u>Production capacity</u></b> on process, line and factory are interpreted 3.2 Production capacity is calculated as per formula 3.3 <b><u>Production target calculation formula</u></b> is identified 3.4 Error free Production target calculation prepared as per formula
4. Perform efficiency calculation	4.1 <b><u>Efficiency calculation method</u></b> is identified 4.2 Efficiency calculation formula is interpreted 4.3 Error free Efficiency calculations are prepared according to the formula
5. Practice skill matrix on workers performance	5.1 <b><u>Skill matrix</u></b> are interpreted as per operation or process expertise 5.2 Skill matrix is prepared as per workers performance
<b>Range of Variables</b>	
<b>Variables</b>	<b>Range</b> (may include but not limited to):
1. Method study	1.1 Selection of work 1.2 Recording of all relevant facts 1.3 Critical examination

	1.4 Development practical, economic, and effective method 1.5 Installation of new method 1.1. Maintenance of new method and periodic checking
2. Procedures of method study	2.1 Select 2.2 Record 2.3 Examine 2.4 Develop 2.5 Define 2.6 Install 2.1 Maintain
3. Work measurement techniques	3.1 Time study 3.2 Activity sampling 3.3 Predetermined motion time systems (PMTS) 3.4 Synthesis from standard data 3.1 Estimating
4. Tools for Standard Minute Value (SMV) / Standard Allocated Minute (SAM) calculation	4.1 Stop watch 4.2 Cycle check data sheet 4.3 Calculator 4.1 Computer
5. Standard Minute Value (SMV) / Standard Allocated Minute (SAM) calculation formula	5.1 Cycle time 5.2 Observed time 5.3 Basic time 5.4 Performance rating 5.5 Allowances
6. Production capacity	6.1 Working time 6.2 SMV / SAM 6.3 Total SMV / SAM earners 6.4 Working days
7. Production target calculation formula	7.1 Production Capacity 7.2 Efficiency 7.3 Absenteeism
8 Efficiency calculation method	8.1 Production output 8.2 SMV / SAM 8.3 SMV / SAM earners 8.4 Working time
9. Skill Matrix	9.1 Operator's skills or expertise 9.2 Types of machine involved 9.3 Types of operation followed
<b>Evidence Guide</b> The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency	

1. Critical aspects of competency	<p>Assessment required evidence that the candidate:</p> <p>1.1 Performed SMV calculation as per formula</p> <p>1.2 Calculated production capacity as per requirements</p> <p>1.3 Prepared target calculation as per formula</p> <p>1.4 Prepared error free efficiency calculation as per formula</p>
2. Underpinning knowledge	<p>2.1 Techniques in work measurement</p> <p>2.2 Tools for SMV calculation</p> <p>2.3 Factory capacity calculation</p> <p>2.4 Skill matrix system</p>
3. Underpinning skills	<p>3.1 Performing SMV calculation as per formula</p> <p>3.2 Calculating production capacity as per requirements</p> <p>3.3 Preparing target calculation as per formula</p> <p>3.4 Preparing error free efficiency calculation as per formula</p>
4. Required attitude	<p>4.1 Commitment to occupational health and safety</p> <p>4.2 Promptness in carrying out activities</p> <p>4.3 Sincere and honest to duties</p> <p>4.4 Environmental concerns</p> <p>4.5 Eagerness to learn</p> <p>4.6 Tidiness and timeliness</p> <p>4.7 Respect for rights of peers and seniors in workplace</p> <p>4.8 Communication with peers and seniors in workplace</p>
5. Resource implications	<p>5.1 Workplace (actual or simulated)</p> <p>5.2 Tools, equipment and physical facilities appropriate to perform activities</p> <p>5.3 Materials consumable to perform activities</p>
6. Methods of assessment	<p>Competency should be assessed by:</p> <p>6.1 Written test</p> <p>6.2 Demonstration</p> <p>6.3 Oral Questioning</p>
7. Context of assessment	<p>7.1 Competency assessment must be done in NSDA accredited assessment centre</p> <p>7.2 Assessment should be done by a NSDA certified/nominated assessor</p>
<p><b>Accreditation Requirements</b></p> <p>Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.</p>	

<b>Unit Code and Title</b>	<b>OU-RMGT-IELM-04-L4-EN-V1: Interpret Lean and lean quality Concepts</b>
<b>Unit Descriptor</b>	<p>This unit covers the knowledge, skills and attitudes required to interpret lean quality concepts.</p> <p>It specifically includes – interpret lean concept, basic of quality concept; interpret quality activities and garments defects.</p>
<b>Nominal Hours</b>	<b>20 Hours</b>
<b>Elements of Competency</b>	<p><b>Performance Criteria</b></p> <p><b><u>Bold &amp; Underlined</u></b> terms are elaborated in the Range of Variables</p>
1. Interpret lean concept	<p>1.1 Lean concept are interpreted.</p> <p>1.2 <b><u>Types of waste</u></b> in manufacturing are identified.</p>
2. Interpret lean quality concept	<p>2.1 Lean Quality concepts are identified.</p> <p>2.2 <b><u>Basic tools of quality</u></b> are identified.</p> <p>2.3 Total Quality Management (TQM) approach are interpreted.</p>
3. Interpret quality activities and garments defects	<p>3.1 Basic quality activities are identified in garments factory.</p> <p>3.2 Quality activities are interpreted as per quality assurance guide.</p> <p>3.3 Types of <b><u>garments defects</u></b> are identified.</p> <p>3.4 Garments defects are interpreted as per sample.</p>
<b>Range of Variables</b>	
<b>Variables</b>	<b>Range</b> (may include but not limited to):
1. Types of waste	<p>1.1 Over production</p> <p>1.2 Over processing</p> <p>1.3 Excess Transportation</p> <p>1.4 Excess inventory</p> <p>1.5 Excess motion</p> <p>1.6 Waiting</p> <p>1.7 Rework</p> <p>1.8 Unused talent</p> <p>1.9 Dis-connectivity</p>
2. Basic tools of quality	<p>2.1 Check sheet</p> <p>2.2 Control chart</p> <p>2.3 Histogram</p> <p>2.4 Cause and effect (Ishikawa) diagram</p> <p>2.5 Pareto chart</p> <p>2.6 Scatter diagram</p> <p>2.7 Flow chart</p>

3. Garments defects	<b>3.1 Defects category</b> <ul style="list-style-type: none"> <li>• Critical defects</li> <li>• Major Defects</li> <li>• Minor Defects</li> </ul> <b>3.2 Defects</b> <ul style="list-style-type: none"> <li>• Fabric defects</li> <li>• Workmanship defects</li> </ul> <b>3.3 Trim defects</b>
<b>Evidence Guide</b> The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency	
1. Critical aspects of competency	Assessment required evidence that the candidate: <ul style="list-style-type: none"> <li>1.1 Identified basic tools of quality.</li> <li>1.2 Identified quality activities.</li> <li>1.3 Prepared garments defects list.</li> </ul>
2. Underpinning knowledge	<ul style="list-style-type: none"> <li>2.1 Tools of quality</li> <li>2.2 Quality activities</li> <li>2.3 Types of garments defects</li> </ul>
3. Underpinning skills	<ul style="list-style-type: none"> <li>3.1 Identifying basic tools of quality.</li> <li>3.2 Identifying quality activities.</li> <li>3.3 Preparing garments defects list.</li> </ul>
4 Required attitude	<ul style="list-style-type: none"> <li>4.1 Commitment to occupational health and safety</li> <li>4.2 Promptness in carrying out activities</li> <li>4.3 Sincere and honest to duties</li> <li>4.4 Environmental concerns</li> <li>4.5 Eagerness to learn</li> <li>4.6 Tidiness and timeliness</li> <li>4.7 Respect for rights of peers and seniors in workplace</li> <li>4.8 Communication with peers and seniors in workplace</li> </ul>
5 Resource implications	<ul style="list-style-type: none"> <li>5.1 Workplace (actual or simulated)</li> <li>5.2 Tools, equipment and physical facilities appropriate to perform activities</li> <li>5.3 Materials consumable to perform activities</li> </ul>
6. Methods of assessment	Competency should be assessed by: <ul style="list-style-type: none"> <li>6.1 Written test</li> <li>6.2 Demonstration</li> <li>6.3 Oral Questioning</li> </ul>

7 Context of assessment	<p>7.1 Competency assessment must be done in NSDA accredited assessment centre</p> <p>7.2 Assessment should be done by a NSDA certified/nominated assessor</p>
<p><b>Accreditation Requirements</b></p> <p>Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.</p>	

<b>Unit Code and Title</b>	<b>OU-RMGT-IELM-05-L4-EN-V1: Identify Tools for Lean Manufacturing</b>
<b>Unit Descriptor</b>	<p>This unit covers the knowledge, skills and attitudes required to Identify tools for lean manufacturing.</p> <p>It specifically includes – interpret lean manufacturing concept; identify production waste; interpret tools and techniques of lean manufacturing; and perform KAIZEN event.</p>
<b>Nominal Hours</b>	<b>55 Hours</b>
<b>Elements of Competency</b>	<b>Performance Criteria</b> <u><b>Bold &amp; Underlined</b></u> terms are elaborated in the Range of Variables
1. Interpret lean manufacturing concept	1.1 <u><b>Basic lean manufacturing system</b></u> is comprehended. 1.2 Purpose of lean manufacturing system is comprehended. 1.3 Lean manufacturing system is applied.
2. Interpret tools and techniques of lean manufacturing	2.1 <u><b>Lean manufacturing tools &amp; techniques</b></u> are identified. 2.2 Results of basic lean manufacturing tools are comprehended. 2.3 Selected lean manufacturing tools are applied as per the guideline.
3. Perform KAIZEN event	3.1 KAIZEN principles are interpreted. 3.2 <u><b>KAIZEN events</b></u> are identified. 3.3 Advantages of KAIZEN events are listed. 3.1. KAIZEN event is implemented.
<b>Range of Variables</b>	
<b>Variables</b>	<b>Range</b> (may include but not limited to):
1. Basic Lean manufacturing system	1.1 Value 1.2 Value stream mapping 1.3 Flow 1.4 Pull 1.5 Perfection
2. Types of waste	2.1 Over production 2.2 Over processing 2.3 Excess Transportation 2.4 Excess inventory 2.5 Excess motion 2.6 Waiting 2.7 Rework 2.8 Unused talents 2.9 Dis-connectivity



3. Lean manufacturing tools & techniques	3.1 Value stream mapping (VSM) and process mapping 3.2 Workplace Organization (e.g., 5S) 3.3 Visual Management 3.4 Kanban and super market 3.5 Standardization of work process 3.6 Cellular manufacturing 3.7 Single Minute Exchange of Die (SMED) 3.8 Problem solving 3.9 Total Productive Maintenance (TPM) 3.10 Overall Equipment Effectiveness (OEE) 3.11 Kaizen
4. KAIZEN event	4.1 Current situation 4.2 Planning and preparation 4.3 Implementation 4.4 Follow-up (GEMBA)
<b>Evidence Guide</b> The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency	
1. Critical aspects of competency	Assessment required evidence that the candidate: 1.1 Applied lean manufacturing system. 1.2 Listed types of 7 waste in manufacturing unit. 1.3 Applied basic lean manufacturing tools & techniques as per manufacturing process. 1.4 Performed KAIZEN event.
2. Underpinning knowledge	2.1 Lean manufacturing system 2.2 Lean manufacturing tools & techniques 2.3 KAIZEN
3. Underpinning skills	3.1 Applying lean manufacturing system. 3.2 Listing types of 7 waste in manufacturing unit. 3.3 Applying basic lean manufacturing tools & techniques as per manufacturing process. 3.4 Performing KAIZEN event.
4. Required attitude	4.1 Commitment to occupational health and safety 4.2 Promptness in carrying out activities 4.3 Sincere and honest to duties 4.4 Environmental concerns 4.5 Eagerness to learn 4.6 Tidiness and timeliness 4.7 Respect for rights of peers and seniors in workplace 4.8 Communication with peers and seniors in workplace
5. Resource implications	5.1 Workplace (actual or simulated).

	5.2 Tools, equipment and physical facilities appropriate to perform activities. 5.3 Materials consumable to perform activities.
6. Methods of assessment	Competency should be assessed by: 6.1 Written test 6.2 Demonstration 6.3 Oral Questioning
7. Context of assessment	7.1 Competency assessment must be done in NSDA accredited assessment centre 7.2 Assessment should be done by a NSDA certified/nominated assessor
<p><b>Accreditation Requirements</b></p> <p>Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.</p>	

<b>Unit Code and Title</b>	<b>OU-RMGT-IELM-06-L4-EN-V1: Interpret Production Planning and Control</b>
<b>Unit Descriptor</b>	<p>This unit covers the knowledge, skills and attitudes required to interpret production planning and control.</p> <p>It specifically includes – interpret Time and Action (TNA) plan; perform plant capacity calculations; identify inventory planning; and perform production scheduling.</p>
<b>Nominal Hours</b>	<b>35 Hours</b>
<b>Elements of Competency</b>	<p><b>Performance Criteria</b></p> <p><b><u>Bold &amp; Underlined</u></b> terms are elaborated in the Range of Variables</p>
1. Interpret Time and Action (TNA) plan	<p>1.1 <b><u>Time and Action (TNA) plan</u></b> is interpreted on the basis of lead time.</p> <p>1.2 TNA plan on a selected order is prepared.</p> <p>1.3 Particular planning on critical issues are prepared as per schedule.</p>
2. Perform plant capacity calculations	<p>2.1 Capacity calculation formula is identified.</p> <p>2.2 Plant capacity formula are interpreted.</p> <p>2.3 <b><u>Plant capacity calculations</u></b> are performed.</p>
3. Identify inventory planning	<p>3.1 Purpose of Inventory planning is identified.</p> <p>3.2 <b><u>Types of inventory</u></b> planning are outlined.</p> <p>3.3 Procedure of preparing inventory planning is outlined.</p>
4. Perform production scheduling	<p>4.1 <b><u>Production scheduling</u></b> is comprehended.</p> <p>4.2 Production scheduling is performed as per schedule.</p>
<b>Range of Variables</b>	
<b>Variables</b>	<b>Range</b> (may include but not limited to):
1. Time and action (TNA) Plan	<p>1.1 Lead time</p> <p>1.2 Combined Execution Plan</p> <p>1.3 Cutting Plan</p> <p>1.4 Sewing Plan</p> <p>1.5 Finishing &amp; Packing Plan</p> <p>1.6 Shipment Plan</p>
2. Plant capacity calculation	<p>2.1 Total number of machines</p> <p>2.2 Total hours factory runs a day</p> <p>2.3 Total number of workers</p>
3. Types of inventory	<p>3.1 Raw materials</p> <p>3.2 Work-in-process / progress (WIP)</p> <p>3.3 Finished goods</p> <p>3.4 Machinery</p> <p>3.5 Tools and equipment</p>

4. Production scheduling	4.1 Lead time 4.2 Working days 4.3 Holidays 4.4 Calendar days 4.5 Takt time 4.6 Risk factors
<b>Evidence Guide</b> The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency	
1. Critical aspects of competency	Assessment required evidence that the candidate: 1.1 Prepared TNA plan. 1.2 Applied capacity calculation. 1.3 Prepared inventory planning as per requirements. 1.4 Prepared line capacity as per sewing line. 1.5 Performed production scheduling as per schedule.
2 Underpinning knowledge	2.1 TNA plan 2.2 Inventory planning 2.3 Information on types of inventory 2.4 Plant capacity calculation 2.5 Production scheduling
3 Underpinning skills	3.1 Preparing TNA plan. 3.2 Applying capacity calculations. 3.3 Preparing inventory planning as per requirements. 3.4 Preparing line capacity as per sewing line. 3.5 Performing production scheduling as per lead time
4 Required attitude	4.1 Commitment to occupational health and safety 4.2 Promptness in carrying out activities 4.3 Sincere and honest to duties 4.4 Environmental concerns 4.5 Eagerness to learn 4.6 Tidiness and timeliness 4.7 Respect for rights of peers and seniors in workplace 4.8 Communication with peers and seniors in workplace
5. Resource implications	5.1 Workplace (actual or simulated). 5.2 Tools, equipment and physical facilities appropriate to perform activities. 5.3 Materials consumable to perform activities.
6. Methods of assessment	Competency should be assessed by: 6.1 Written test 6.2 Demonstration

	6.3 Oral Questioning
7. Context of assessment	<p>7.1 Competency assessment must be done in NSDA accredited assessment centre</p> <p>7.2 Assessment should be done by a NSDA certified/nominated assessor</p>
<p><b>Accreditation Requirements</b></p> <p>Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.</p>	

<b>Unit Code and Title</b>	<b>OU-RMGT-IELM-07-L4-EN-V1: Perform Optimization Techniques in Different Department</b>
<b>Unit Descriptor</b>	This unit covers the knowledge, skills and attitudes required to perform optimization techniques in different departments. It specifically includes – interpret industrial setup and layout; perform utilization of clothing material; and perform process optimization.
<b>Nominal Hours</b>	<b>35 Hours</b>
<b>Elements of Competency</b>	<b>Performance Criteria</b> <b><u>Bold &amp; Underlined</u></b> terms are elaborated in the Range of Variables
1. Interpret industrial setup and layout	1.1 Industrial setup and layout is identified as per plant design. 1.2 Required layout is illustrated.
2. Perform utilization of clothing material	2.1 Efficiency of <b><u>clothing material consumption</u></b> is identified. 2.2 Material utilization percentage are calculated as per Bills of Materials (BOM) sheet.
3. Perform process optimization	3.1 <b><u>Bottle neck process</u></b> are identified in the manufacturing steps. 3.2 <b><u>Techniques of line balancing</u></b> are identified. 3.3 Line balancing tools is identified as per line layout 3.4 <b><u>Balancing loss</u></b> formula is comprehended. 3.5 Balancing loss of the lines are calculated as per formula. 3.6 Non-productive time (NPT) is identified and calculated.
<b>Range of Variables</b>	
<b>Variables</b>	<b>Range</b> (may include but not limited to):
1. Clothing material consumption	1.1 Types of fabric 1.2 Styling of apparel 1.3 Fabric width 1.4 Seam allowances 1.5 Marker efficiency 1.6 Shrinkage of the fabric 1.7 Size ratio breakup 1.8 Trims type 1.9 Accessories type
2. Bottle neck process	2.1 Process SMV / SAM 2.2 Capacity 2.3 Capacity utilization 2.4 Idle time 2.5 Work in process / progress (WIP)

	2.6 Set-up time 2.7 Direct labor content 2.8 indirect labor content 2.9 Direct labor utilization 2.10 Indirect labor utilization 2.11 Hourly production 2.12 Material supply
3. Techniques of line balancing	3.1 Split the task 3.2 Share the task 3.3 Pitch time 3.4 Upper control limit 3.5 Lower control limit 3.6 Use Parallel work station 3.7 Improving material transfer 3.8 Motivation
4. Balancing loss	4.1 Number of allocated machine 4.2 Number of calculated machine
<b>Evidence Guide</b> The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency	
1. Critical aspects of competency	Assessment required evidence that the candidate: 1.1 Calculated fabric utilization percentage setting. 1.2 Detected bottleneck process. 1.3 Calculated balancing loss of the line as per formula.
2. Underpinning knowledge	2.1 Material consumption calculation 2.2 Bottle neck process 2.3 Line balancing 2.4 Line balancing tools 2.5 Balancing loss formula
3. Underpinning skills	3.1 Calculating fabric utilization percentage setting. 3.2 Detecting bottleneck process. 3.3 Calculating balancing loss of the line as per formula.
4. Required attitude	4.1 Commitment to occupational health and safety 4.2 Promptness in carrying out activities 4.3 Sincere and honest to duties 4.4 Environmental concerns 4.5 Eagerness to learn 4.6 Tidiness and timeliness 4.7 Respect for rights of peers and seniors in workplace 4.8 Communication with peers and seniors in workplace

5. Resource implications	5.1 Workplace (actual or simulated). 5.2 Tools, equipment and physical facilities appropriate to perform activities. 5.3 Materials consumable to perform activities.
6. Methods of assessment	Competency should be assessed by: 6.1 Written test 6.2 Demonstration 6.3 Oral Questioning
7. Context of assessment	7.1 Competency assessment must be done in NSDA accredited assessment centre 7.2 Assessment should be done by a NSDA certified/nominated assessor
<b>Accreditation Requirements</b> Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.	



**Experts Involved on development process of this standard**

Industry experts who provided their valuable inputs to construct this competency standard  
(May- July 2017)

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Mr. Syed Azharul Haque	BC SD03 Project	National Subject Matter Consultant- RMG Sector
Ms. Rashmi Mehra	BC SD03 Project	International Consultant for Development of CBLM

## Working Group

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(09<sup>th</sup> July 2017)

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## Validation Workshop

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Mr. Syed Azharul Haque	BC SD03 Project	National Subject Matter Consultant- RMG Sector

**Validation of Competency Standard by Standard and Curriculum Validation Committee (SCVC)**

The Competency Standards for National Skills Certificate in **Industrial Engineering and Lean Manufacturing NTVQF L-IV** Qualification is validated by SCVC on 13 November 2019 and approved by NSDA.

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