COMPETENCY STANDARD

FOR

Industrial Engineering and Lean Manufacturing

(RMG and Textile ISC)

Level: 04

Competency Standard Code: I10S005L4V1

National Skills Development Authority
Prime Minister's Office,Bangladesh

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Introduction

The National Skills Development Authority (NSDA) aims to enhance an individual's employability by certifying competiveness 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 skill 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 programmes. "**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 students enrolled in TVET. Students who successfully pass the assessment will receive a qualification in the National Technical and Vocational Qualification Framework (NTVQF) 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

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 & 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.

Bangladesh NTVQF with Job Classifications

NTVQF LEVELS	EDUCATION SECTORS			Job Classification
	Pre-Vocation Education	Vocational Education	Technical Education	
NTVQF 6			Diploma in engineering or equivalent	Middle Level Manager /Sub Assistant Engr. etc.
NTVQF 5		National Skill Certificate 5 (NSC 5)		Highly Skilled Worker / Supervisor
NTVQF 4		National Skill Certificate 4 (NSC 4)		Skilled Worker
NTVQF 3		National Skill Certificate 3 (NSC 3)		Semi-Skilled Worker
NTVQF 2		National Skill Certificate 2 (NSC 2)		Basic Skilled Worker
NTVQF 1		National Skill Certificate 1 (NSC 1)		Basic Worker
Pre-Voc 2	National Pre-Vocation Certificate 2 (NPVC 2)			Pre-Vocation Trainee
Pre-Voc 1	National Pre-Vocation Certificate 1 (NPVC 1)			Pre-Vocation Trainee

NTVQF Level Descriptors

NTVQF Level	Knowledge	Skill	Responsibility	Job Class.
6	• Comprehensive actual and theoretical knowledge within a specific study area with an awareness of the limits of that knowledge	• Specialised and restricted range of cognitive and practical skills required to provide leadership in the development of creative solutions to defined problems	• Mange a team or teams in workplace activities where there is unpredictable change • Identify and design learning programs to develop performance of team members	Supervisor / Middle Level Manager /Sub Assistant Engr. etc.
5	• Very broad knowledge of the underlying, concepts, principles, and processes in a specific study area	• Very broad range of cognitive and practical skills required to generate solutions to specific problems in one or more study areas.	• Take overall responsibility for completion of tasks in work or study • Apply past experiences in solving similar problems	Highly Skilled Worker / Supervisor
4	• Broad knowledge of the underlying, concepts, principles, and processes in a specific study area	• 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	• Take responsibility, within reason, for completion of tasks in work or study • Apply past experiences in solving similar problems	Skilled Worker
3	• Moderately broad knowledge in a specific study area.	• 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	• Work or study under supervision with some autonomy	Semi-Skilled Worker
2	• Basic underpinning knowledge in a specific study area.	• Basic skills required to carry out simple tasks	• Work or study under indirect supervision in a structured context	Basic Skilled Worker
1	• Elementary understanding of the underpinning knowledge in a specific study area.	• Limited range of skills required to carry out simple tasks	• Work or study under direct supervision in a structured context	Basic Worker
Pre-Voc 2	• Limited general knowledge	• Very limited range of skills and use of tools required to carry out simple tasks	• Work or study under direct supervision in a well-defined, structured context.	Pre-Vocation Trainee
Pre-Voc 1	• Extremely limited general knowledge	• Minimal range of skills required to carry out simple tasks	• Simple work or study exercises, under direct supervision in a clear, well defined structured context	Pre-Vocation Trainee

List of Abbreviations

General

NSDA – National Skills Development Authority

NTVQF – National Technical and Vocational Qualifications Framework

TVET – Technical Vocational Education and Training

ISC – Industry Skills Council

NPVC – National Pre-Vocation Certificate

PPP -- Public Private Partnership

SCVC – Standards and Curriculum Validation Committee

CS – Competency Standard

UoC – Unit of Competency

Occupation Specific Abbreviations

MSDS – Material Safety Data Sheet

OSH – Occupational Safety and Health

PPE – Personal Protective Equipment

SOP – Standard Operating Procedures

Approval of Competency Standard

Members of the Approval Committee:

Member	Signature
Md. Faruque Hossain Executive Chairman (Secretary) National Skills Development Authority (NSDA)	
Pijush Kanti Nath Additional Secretary Member (Admin & Finance) National Skills Development Authority (NSDA)	12.01.20
Mohammad Rezaul Karim Additional Secretary Member (Skills Standard & Certification) National Skills Development Authority (NSDA)	12.01.2020
Md. Abdur Razzaque Joint Secretary Member (Planning & Research) National Skills Development Authority (NSDA)	12.01.2020

Md. Faruque Hossain
Executive Chairman (Secretary)
National Skills Development Authority (NSDA)
Date: 12.01.2020

National Competency Standards for National Skill Certificate - IV in Industrial Engineering and Lean Manufacturing in RMG and Textile (RT) Sector.

Course Structure

SL	Unit Code and Title		UoC Level	Nominal Duration (Hours)
The Generic Competencies (02 UoCs required)				**50**
1.	GCU02L1V1	Apply Occupational Health and Safety (OSH) Practices at Workplace	1	30
2.	GCU08L4V1	Lead Small Team	4	20
The Sector Specific Competencies (02 UoCs required)				**45**
1.	SSU01I10L2V1	Recognize the RMG Business Scenario	2	15
2.	SSU08I10L2V1	Interpret Drawing and Specifications in Manuals for the RMG Industries	2	30
The Occupation Specific Competencies (07 UoCs Required)				**265**
1.	OSU01I10L4V1	Interpret Basic Garments Construction	4	35
2.	OSU02I10L4V1	Illustrate Garments Operations	4	25
3.	OSU03I10L4V1	Interpret Work Study Techniques	4	60
4.	OSU04I10L4V1	Interpret Lean and lean quality concepts	4	20
5.	OSU06I10L4V1	Identify Tools for Lean Manufacturing	4	55
6.	OSU05I10L4V1	Interpret Production Planning and Control	4	35
7.	OSU07I10L4V1	Perform Optimization Techniques in Different Department	4	35
Total Nominal Learning Hours				**360**

Units and Elements

The Generic Specific Competencies

Code	Unit of Competency	Elements of Competency	Duration (Hours)
GCU02L1V1	Apply OSH Practices in the Workplace	1. Identify, control and report OSH hazards 2. Conduct work safely 3. Follow emergency response procedures 4. Maintain and improve health and safety in the workplace	30
GCU08L4V1	Lead Small Team	1. Provide team leadership 2. Assign responsibilities 3. Set performance expectations for team members 4. Supervise team performance	20
Total Hour			**50**

The Sector Specific Competencies

Code	Unit of competency	Elements of competency	Duration (Hours)
SSU01I10L2V1	Recognize the RMG Business Scenario	1. Identify basic business communication practices in RMG sector 2. Recognize history of RMG industries in Bangladesh 3. Identify major departments of RMG Industries 4. List prime export markets	15
SSU03I10L2V1	Interpret Drawing and Specifications in Manuals for the RMG Industries	1. Identify information from manual 2. Identify drawing and specifications 3. Interpret drawing and specifications 4. Store manuals	30
Total Hours			**45**

The Occupation Specific Competencies

Code	Unit of Competency	Elements of competency	Duration (hours)
OSU01I10L4V1	Identify Basic Garments Construction	1. Comprehended process from fibres to finished garments 2. Identify functions of industrial sewing machine and attachment 3. Identify stitch and seam on garments style 4. List clothing materials used for garments	35
OSU02I10L4V1	Illustrate Garments Operation	1. Interpret garments operation breakdown 2. Apply line layout on styling	25
OSU03I10L4V1	Identify Work Study Techniques	1. Identify method study and work measurement 2. Perform Standard Minute Value (SMV) / Standard Allocated Minute (SAM) calculation 3. Perform production capacity and target calculation 4. Perform efficiency calculation 5. Practice skill matrix on workers performance	60
OSU04I10L4V1	Interpret Lean and lean quality Concepts	1. Interpret lean concept 2. Interpret lean quality concept 3. Interpret quality activities and garments defects	20
OSU05I10L4V1	Identify Tools for Lean Manufacturing	1. Interpret lean manufacturing concept 2. Interpret tools and techniques of lean manufacturing 3. Perform KAIZEN event	35
OSU06I10L4V1	Interpret Production Planning and Control	1. Interpret Time and Action (TNA) plan 2. Perform plant capacity calculations 3. Identify inventory planning 4. Perform production scheduling	55
OSU07I10L4V1	Perform optimization techniques in different department	1. Interpret industrial setup and layout 2. Perform utilization of clothing material 3. Perform process optimization	35
Total Hours			**265**

The Generic Competencies

National Technical and Vocational Qualifications Framework for Bangladesh
Unit of Competency

Unit Code and Title	**GCU02L1V1: Apply Occupational Health and Safety (OSH) Practices at Workplace**
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to apply occupational health and safety (OSH) practices at workplace. It specifically includes – identify, control and report OSH hazards; conduct work safety; follow emergency response procedures; and maintain and improve health and safety in the workplace.
Nominal Hours	**30 Hours**
Elements of Competency	**Performance Criteria** **Bold &underlined** terms are elaborated in the Range of Variables
1. Identify, control and report OSH hazards	1.1 Immediate work area is routinely checked for Occupational Health and Safety (OSH) hazards prior to commencing and during work. 1.2 **Hazards** and unacceptable performance are identified and corrective action is taken within the level of responsibility. 1.3 OSH hazards and incidents are reported to appropriate personnel according to workplace procedures. 1.4 Safety signs and symbols are identified and followed.
2. Conduct work safety	2.1 OSH practices are applied in the workplace. 2.2 **Personal Protective Equipment (PPE)** is used.
3. Follow emergency response procedures	3.1 Emergency situations are identified and reported according to workplace requirements. 3.2 Emergency procedures are followed as appropriate to the nature of the emergency and according to workplace procedures. 3.3 **Workplace procedures** for dealing with accidents, fires and emergencies are followed whenever necessary within scope of responsibilities.

4. Maintain and improve health and safety in the workplace	4.1 Risks are identified and appropriate control measures are implemented in the workplace. 4.2 Recommendations arising from risk assessments are implemented within level of responsibility. 4.3 Opportunities for improving OSH performance are identified and raised with relevant personnel. 4.4 Safety records are maintained according to **company policies.**
Range of Variables	
Variables	**Range** (may include but not limited to):
1. Hazards	1.1 OSH incidents include near misses, injuries, illnesses and property damage, noise, handling hazardous substances, other hazards 1.2 Working with and near moving equipment / load shifting equipment 1.3 Broken or damaged equipment or materials
2. Personal Protective Equipment (PPE)	2.1 Apron 2.2 Safety Helmet 2.3 Goggles 2.4 Ear muffs 2.5 Ear plugs 2.6 Gloves 2.7 Clothing 2.8 Safety Boots
3. Workplace procedures	3.1 OSH system and related documentation including policies and procedures 3.2 Standard Operating Procedures (SOPs) 3.3 Information on Hazards and work process, hazard alerts, safety signs and symbols 3.4 Labels 3.5 Material Safety Data Sheets (MSDSs) and manufacturers' advice
4. Company policies	4.1 Job related Standard Operating Procedures (SOPs) 4.2 Occupational Health and Safety (OSH) specific procedures 4.3 Examples of OSH procedures include – consultation and participation, emergency response to specific hazards, incident investigation, risk assessment, reporting arrangement and issue resolution

	procedures.
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	1.1 Used Personal Protective Equipment (PPE). 1.2 Identified hazards. 1.3 Took corrective action of different hazards. 1.4 Took corrective action for emergency procedure. 1.5 Reported emergency situation to the Supervisor / Manger. 1.6 Satisfied requirements mentioned in the performance criteria and range of variables.
2. Underpinning knowledge	2.1 OSH Workplace Policies and Procedures 2.2 Work Safety Procedures 2.3 Fire and emergency procedures 2.4 Types of Hazards (Biological, Chemical and Physical) and their effects) 2.5 PPE types and uses 2.6 Personal Hygiene Practices 2.7 OSH Awareness 2.8 Steps of Hazard Identification 2.9 Principles of Hazards control 2.10 Employer's Role 2.11 Supervisor's Responsibilities
3. Underpinning skills	3.1 Identifying OSH policies and procedures 3.2 Following personal work safety practices 3.3 Reporting hazards and risks 3.4 Responding to emergency procedures 3.5 Maintaining physical well-being in the workplace 3.6 Identify tools and equipment related to OSH 3.7 Improving OSH performance

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 Eagerness to learn 4.5 Tidiness and timeliness 4.6 Environmental concerns 4.7 Respect 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 and equipment appropriate to workplace 5.3 Materials relevant to the proposed activity 5.4 All tools, equipment, material and documentation required 5.5 Relevant specifications or work instructions
6. Methods of assessment	Methods of assessment may include but not limited to: 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 a training institute or in an actual or simulated after completion of the training module. 7.2 Assessment should be done by NSDA certified 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 any NTVQF qualification. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.

National Technical and Vocational Qualifications Framework for Bangladesh
Unit of Competency

Unit Code and Title	GCU08L4V1: Lead Small Team
Unit Descriptor	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.
Nominal Hours	**20 Hours**
Elements of Competency	**Performance Criteria** **Bold &underlined** terms are elaborated in the Range of Variables
1. Provide team leadership	1.1 **Work requirements** are identified and presented to team members. 1.2 Reasons for instructions and requirements are communicated to team members. 1.3 **Team members' queries and concerns** are recognized, discussed and dealt with.
2. Assign responsibilities	2.1 Duties, and responsibilities are allocated having regard to the skills, knowledge and attitudes required to properly undertake the assigned task. 2.2 Duties are allocated having regard to individual preference, domestic and personal considerations, whenever possible.
3. Set performance expectations for team members	3.1 Performance expectations are established based on client needs and according to assignment requirements. 3.2 Performance expectations are based on individual team members' duties and area of responsibility. 3.3 Performance expectations are discussed and directed to implement in the workplace.

4. Supervise team performance	4.1 **Monitoring of performance** are taken place against defined performance criteria and / or assignment instructions and corrective action taken if required. 4.2 Team members are provided **feedback**, positive support and advice on strategies to overcome any deficiencies. 4.3 **Performance issues** which cannot be rectified or addressed within the team are referenced to appropriate personnel. 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. 4.5 Team operations are monitored to ensure that employer / client needs and requirements are met. 4.1 Follow-up communication is provided on all issues affecting the team. 4.6 All relevant documentation is completed.
Range of Variables	
Variable	**Range** (may include but are 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

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	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. 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 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 6.4 Portfolio
7. Context of assessment	7.1 Competency assessment must be done in a training centre or in an actual or simulated workplace after completion of the training module. 7.2 Assessment should be done by NSDA certified 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 any NTVQF qualification. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.

The Sector Specific Competencies

National Technical and Vocational Qualifications Framework for Bangladesh
Unit of Competency

Unit Code and Title	**SSU01I10L2V1: Recognize the RMG Business Scenario**
Unit Descriptor	This unit covers the knowledge; skills and attitudes required to recognize the RMG business scenario. It specifically includes – identify basic business communication practices in RMG industries; recognize history of RMG industries in Bangladesh; identify major departments of RMG industries; and list prime export markets.
Nominal Hours	**15 Hours**
Elements of Competency	**Performance Criteria** **Bold &underlined** terms are elaborated in the Range of Variables
1. Identify basic business communication practices in RMG industries	1.1 The communication requirements in the RMG industries are recognized in alignment to the role of RMG industries. 1.2 **Modes of Communication** are explained. 1.3 Communication policies and guidelines are identified and interpreted.
2. Recognize history of RMG Industries in Bangladesh	2.1 **Background of RMGIndustries** in Bangladesh is inferred with reference to the past history, present status and expected future trends. 2.2 Importance of the RMG industries 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 Industries	3.1 Scope and nature of **major departments** of the RMG sector are identified. 3.2 Role and responsibilities of individuals are identified in relation to the department and organization as a whole.

	3.3 The **machines** used in different departments are identified.
4. List prime export markets	4.1 The types of **prime export markets** are categorized on the basis of their current and future potential. 4.2 Export marketing process is interpreted.
Range of Variables	
Variable	**Range** (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 Industries	2.1 History of Bangladesh RMG Industries 2.2 Economy of Bangladesh 2.3 SWOT analysis on RMG Industries 2.4 Gender dynamics of garments industry in Bangladesh. 2.5 Wages & efficiency in the garments industry 2.6 Compliance
3. Major Departments	3.1 PDS 3.2 Store 3.3 Cutting 3.4 Embellishment 3.5 Sewing 3.6 Washing 3.7 Finishing 3.8 Quality 3.9 Industrial Engineering 3.10 Production Planning and Control 3.11 Maintenance 3.12 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
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	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 Industries. 2.3 Trends in the RMG Industries. 2.4 Production process. 2.5 Different Department in RMG Industries. 2.6 Own roles and responsibilities. 2.7 Types of prime export markets.
3. Underpinning skills	3.1 Identifying policies and guidelines in RMG industries. 3.2 Interpreting business communication technique. 3.3 Interpreting trends of RMG industries. 3.4 Identifying departments in RMG industries. 3.5 Identifying machines used in different departments.
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 Communication 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 physical facilities appropriate to perform activities. 5.3 Materials consumable to perform activities.
6. Methods of assessment	Methods of assessment may include but not limited to: 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 a training center or in an actual or simulated work place after completion of the training module. 7.2 Assessment should be done by NSDA certified 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 any NTVQF qualification. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.

National Technical and Vocational Qualifications Framework for Bangladesh
Unit of Competency

Unit Code and Title	**SSU03I10L2V1: Interpret Drawing and Specifications in Manuals for the RMG Industries**
Unit Descriptor	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.
Nominal Hours	**30 Hours**
Elements of Competency	**Performance Criteria** **Bold &underlined** terms are elaborate in the Range of Variables
1. Identify information from manuals	1.1 Appropriate **manuals** 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 **drawing** and **specifications** are identified. 2.2 **Terms and abbreviation** are identified. 2.3 **Signs and symbols** 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.
Range of Variables	
Variable	**Ranges**(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
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	1.1 Interpreted drawings and specifications. 1.2 Identified signs and symbols. 1.3 Satisfied the requirements mentioned in the performance criteria and range of variables.
2. Underpinning knowledge	2.1 Types of RMG manuals. 2.2 Identification of signs and symbols. 2.3 Identification of units of measurement. 2.4 Identification of units of conversion. 2.5 Drawings and specifications. 2.6 Terms and abbreviations used.
3. Underpinning skills	3.1 Identifying appropriate manuals. 3.2 Identifying drawings and specifications. 3.3 Interpreting drawings and specifications. 3.4 Storing manuals.
4. Required attitude	4.1 Commitment to occupational health and safety. 4.2 Promptness in carrying out activities. 4.3 Sincere & honest to duties. 4.4 Tidiness & timeliness. 4.5 Eagerness to learn. 4.6 Environmental concerns. 4.7 Respect for rights of peers and seniors at workplace.

	4.8 Communication with peers & seniors at workplace.
5. Resources implications	The following resources must be provided: 5.1 Workplace (actual or simulated). 5.2 Availability of all manuals. 5.3 Accessibility of storage area. 5.4 Instructions sheet. 5.5 Module.
6. Methods of assessment	Methods of assessment may include but not limited to: 6.1 Writtentest. 6.2 Demonstration. 6.3 Oral questioning. 6.4 Portfolio.
7. Context of assessment	7.1 Competencyassessment must be done in a training center or in an actual or simulated workplace after completion of the training module. 7.2 Assessment should be done by NSDA certified 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 any NTVQF qualification. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.

The Occupation Specific Competencies

National Technical and Vocational Qualifications Framework for Bangladesh
Unit of Competency

Unit Code and Title	**OSU01I10L4V1: Interpret Basic Garments Construction**
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to interpret basic garments construction. 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.
Nominal Hours	**35 Hours**
Elements of Competency	**Performance Criteria** **Bold &underlined** terms are elaborated in the Range of Variables
1. Comprehend process from fibers to finished garments	1.1 **Fabric manufacturing processes** are identified. 1.2 **Garments manufacturing processes** are identified. 1.3 Manufacturing steps are listed according to the type of garment to be manufactured.
2. Identify functions of industrial sewing machine and attachment	2.1 Types of **Industrial Sewing machines** are identified as per specification. 2.2 Functions of industrial sewing machines are interpreted as per specification. 2.3 Types of **attachments** are identified as per styling of garments.
3. Identify stitch and seam on garments style	3.1 **Types of Stitches** are identified as per garment style. 3.2 **Types of Seams** are identified as per garment style. 3.3 Garments stitch quality is interpreted as per sample. 3.4 Garments seam quality is interpreted as per sample.

4. List clothing materials used for garments	4.1 **Types of Clothing materials** are identified. 4.2 Clothing materials are listed as per the BOM (Bill of Material) sheet.
Range of Variables	
Variables	**Range** (may include but not limited to):
1. Fabric manufacturing process	1.1 Fiber 1.2 Yarn 1.3 Woven fabric 1.4 Knit fabric 1.5 Dying, printing and finishing 1.6 Yarn dyed fabrics
2. Garments manufacturing process	2.1 Design 2.2 Pattern making 2.3 Fit sample making 2.4 Production pattern making 2.5 Grading 2.6 Marker making 2.7 Fabric spreading 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 Bartack 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: • Yarn • Fabric 7.2 Sub materials: 7.3 Trims & Accessories
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	1.1 Listed steps of manufacturing process as per flow chart. 1.2 Identified industrial sewing machine. 1.3 Identified stitch& seam quality as per sample. 1.4 Recognized clothing materials. 1.5 Illustrated major safety issues for RMG industries.
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. 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 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	The following resources must be provided: 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	Methods of assessment may include but not limited to: 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 a training center or in an actual or simulated work place after completion of the training module. 7.2 Assessment should be done by NSDA certified assessor.

Accreditation Requirements

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National Technical and Vocational Qualifications Framework for Bangladesh
Unit of Competency

Unit Code and Title	**OSU02I10L4V1: Illustrate Garments Operation**
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to illustrate garments operation. It specifically includes – interpret garments operation breakdown; and apply line layout on styling.
Nominal Hours	**25 Hours**
Elements of Competency	**Performance Criteria** **Bold &underlined** terms are elaborated in the Range of Variables
1. Interpret garments operation breakdown	1.1 **Garments operation breakdown** is interpreted as per styling. 1.2 Garments operation breakdown is prepared as per sample shared by the client/buyer.
2. Apply line layout on styling	2.1 **Line layout** is interpreted as per styling. 2.2 Line **layout types** are selected as per job requirement.
Range of Variables	
Variables	**Range** (may include but not limited to):
1. Garments operation breakdown	1.1 Style of the garments 1.2 Garment parts • Front part • Back part • Assembling part
2. Line layout	2.1 Operation breakdown 2.2 Operation wise machine selection 2.3 Operation wise operator selection 2.4 Standard Minute Value (SMV) / Standard Allocated Minute (SAM) 2.5 Line balancing information

3. Layout types	3.1 Straight layout 3.2 Side by side machine layout 3.3 U- shaped line layout 3.4 Face to Face layout 3.5 Modular line layout 3.6 Progressive Bundle System (PBS) 3.7 Unit Production System (UPS)
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	1.1 Demonstrated operation breakdown as per sample. 1.2 Performed line layout as per styling.
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. 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 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	The following resources must be provided: 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	Methods of assessment may include but not limited to: 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 a training center or in an actual or simulated work place after completion of the training module. 7.2 Assessment should be done by NSDA certified assessor.

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National Technical and Vocational Qualifications Framework for Bangladesh
Unit of Competency

Unit Code and Title	**OSU03I10L4V1: Interpret Work Study Techniques**
Unit Descriptor	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.
Nominal Hours	**60 Hours**
Elements of Competency	**Performance Criteria** **Bold & underlined** terms are elaborated in the Range of Variables
1. Identify method study and work measurement	1.1 **Method study** are defined. 1.2 **Procedures of method** study are identified. 1.3 Work measurement are defined. 1.4 **Work measurement techniques** are identified.
2. Perform Standard Minute Value (SMV) / Standard Allocated Minute (SAM) calculation	2.1 **Tools for Standard Minute Value (SMV) / Standard Allocated Minute (SAM) calculation** are identified. 2.2 Procedures of SMV /SAM calculation are comprehended as per plan. 2.3 **SMV / SAM calculation formula** is interpreted. 2.4 Error free SMV / SAM calculation is performed according to formula.
3. Perform production capacity and target calculation	3.1 **Production capacity** on process, line and factory are interpreted. 3.2 Production capacity is calculated as per formula. 3.3 **Production target calculation formula** is identified. 3.4 Error free Production target calculation prepared as per formula.

4. Perform efficiency calculation	4.1 **Efficiency calculation method** 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 **Skill matrix** are interpreted as per operation or process expertise. 5.2 Skill matrix is prepared as per workers performance.
Range of Variables	
Variable	**Range** (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 1.6 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 2.7 Maintain
3. Work measurement techniques	3.1 Time study 3.2 Activity sampling 3.3 Predetermined motion time systems (PMTS) 3.4 Synthesis form standard data 3.5 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 4.4 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
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	1.1 Performed SMV calculation as per formula. 1.2 Calculated production capacity as per requirements. 1.3 Prepared target calculation as per formula. 1.4 Prepared error free efficiency calculation as per formula.
2. Underpinning knowledge	2.1 Techniques in work measurement. 2.2 Tools for SMV calculation. 2.3 Factory capacity calculation. 2.4 Skill matrix system.

3. Underpinning skills	3.1 Performing SMV calculation as per formula 3.2 Calculating production capacity as per requirements 3.3 Preparing target calculation as per formula 3.4 Preparing error free efficiency calculation as per formula
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 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	The following resources must be provided: 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	Methods of assessment may include but not limited to: 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 a training center or in an actual or simulated work place after completion of the training module. 7.2 Assessment should be done by NSDA certified assessor.

Accreditation Requirements

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National Technical and Vocational Qualifications Framework for Bangladesh
Unit of Competency

Unit Code and Title	**OSU04I10L4V1: Interpret Lean and lean quality Concepts**
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to interpret lean quality concepts. It specifically includes – interpret lean concept, basic of quality concept; interpret quality activities and garments defects.
Nominal Hours	**20 Hours**
Elements of Competency	**Performance Criteria** **Bold &underlined** terms are elaborated in the Range of Variables
1. Interpret lean concept	1.1 Lean concept are interpreted. 1.2 **Types of waste** in manufacturing are identified.
2. Interpret lean quality concept	2.1 Lean Quality concepts are identified. 2.2 **Basic tools of quality** are identified. 2.3 Total Quality Management (TQM) approach are interpreted.
2. Interpret quality activities and garments defects	3.1 Basic quality activities are identified in garments factory. 3.2 Quality activities are interpreted as per quality assurance guide. 3.3 Types of **garments defects** are identified. 3.4 Garments defects are interpreted as per sample.
Range of Variables	
Variables	**Range** (may include but not limited to):

1. Types of waste	1.1 Over production 1.2 Over processing 1.3 Excess Transportation 1.4 Excess inventory 1.5 Excess motion 1.6 Waiting 1.7 Rework 1.8 Unused talent 1.9 Dis-connectivity
2. Basic tools of quality	2.1. Check sheet 2.2. Control chart 2.3. Histogram 2.4. Cause and effect (Ishikawa) diagram 2.5. Pareto chart 2.6. Scatter diagram 2.7. Flow chart
3. Garments defects	3.1. **Defects category** • Critical defects • Major Defects • Minor Defects 3.2. **Defects** • Fabric defects • Workmanship defects • Trim defects
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	1.1 Identified basic tools of quality. 1.2 Identified quality activities. 1.3 Prepared garments defects list.
2. Underpinning knowledge	2.1 Tools of quality 2.2 Quality activities 2.3 Types of garments defects
3. Underpinning skills	3.1 Identifying basic tools of quality. 3.2 Identifying quality activities. 3.3 Preparing garments defects list.

4. Underpinning attitudes	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	The following resources must be provided: 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	Methods of assessment may include but not limited to: 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 a training center or in an actual or simulated work place after completion of the training module. 7.2 Assessment should be done by NSDA certified assessor.

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National Technical and Vocational Qualifications Framework for Bangladesh
Unit of Competency

Unit Code and Title	**OSU06I10L4V1: Identify Tools for Lean Manufacturing**
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to Identify tools for lean manufacturing. It specifically includes – interpret lean manufacturing concept; identify production waste; interpret tools and techniques of lean manufacturing; and perform KAIZEN event.
Nominal Hours	**55 Hours**
Elements of Competency	**Performance Criteria** **Bold &underlined** terms are elaborated in the Range of Variables
1. Interpret lean manufacturing concept	1.1 **Basic lean manufacturing system** 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 **Lean manufacturing tools & techniques** 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 **KAIZEN events** are identified. 3.3 Advantages of KAIZEN events are listed. 3.4 KAIZEN event is implemented.
Range of Variables	
Variables	**Range** (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 steam 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) 3.10Overall Equipment Effectiveness (OEE) 3.11Kaizen
4. KAIZEN event	4.1 Current situation 4.2 Planning and preparation 4.3 Implementation 4.4 Follow-up (GEMBA)
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	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. 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 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	The following resources must be provided: 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	Methods of assessment may include but limited to: 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 a training center or in an actual or simulated work place after completion of the training module. 7.2 Assessment should be done by NSDA certified assessor.

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Unit Code and Title	**OSU05I10L4V1: Interpret Production Planning and Control**
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to interpret production planning and control. It specifically includes – interpret Time and Action (TNA) plan; perform plant capacity calculations; identify inventory planning; and perform production scheduling.
Nominal Hours	**35 Hours**
Elements of Competency	**Performance Criteria** **Bold &underlined** terms are elaborated in the Range of Variables
1. Interpret Time and Action (TNA) plan	1.1 **Time and Action (TNA) plan** is interpreted on the basis of lead time. 1.2 TNA plan on a selected order is prepared. 1.3 Particular planning on critical issues are prepared as per schedule.
2. Perform plant capacity calculations	2.1 Capacity calculation formula is identified. 2.2 Plant capacity formula are interpreted. 2.3 **Plant capacity calculations** are performed.
3. Identify inventory planning	3.1 Purpose of Inventory planning is identified. 3.2 **Types of inventory** planning are outlined. 3.3 Procedure of preparing inventory planning is outlined.
4. Perform production scheduling	4.1 **Production scheduling** is comprehended. 4.2 Production scheduling is performed as per schedule.
Range of Variables	
Variables	**Range** (may include but not limited to):
1. Time and action (TNA) Plan	1.1 Lead time 1.2 Combined Execution Plan 1.3 Cutting Plan 1.4 Sewing Plan

	1.5 Finishing & Packing Plan 1.6 Shipment Plan
2. Plant capacity calculation	2.1 Total number of machines 2.2 Total hours factory runs a day 2.3 Total number of workers
3. Types of inventory	3.1 Raw materials 3.2 Work-in-process / progress (WIP) 3.3 Finished goods 3.4 Machinery 3.5 Tools and equipment
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
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	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 Appling 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. 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 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	The following resources must be provided: 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	Methods of assessment may include but not limited to: 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 a training center or in an actual or simulated work place after completion of the training module. 7.2 Assessment should be done by NSDA certified assessor.

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National Technical and Vocational Qualifications Framework for Bangladesh
Unit of Competency

Unit Code and Title	**OSU07I10L4V1: Perform Optimization Techniques in Different Department**
Unit Descriptor	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.
Nominal Hours	**35 Hours**
Elements of Competency	**Performance Criteria** **Bold &underlined** 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 **clothing material consumption** is identified. 2.2 Material utilization percentage are calculated as per Bills of Materials (BOM) sheet.
3. Perform process optimization	3.1 **Bottle neck process** are identified in the manufacturing steps. 3.2 **Techniques of line balancing** are identified. 3.3 Line balancing tools is identified as per line layout 3.4 **Balancing loss** 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.
Range of Variables	
Variables	**Range** (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 2.10Indirect labor utilization 2.11Hourly 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
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	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. 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 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	The following resources must be provided: 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	Methods of assessment may include but not limited to: 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 a training center or in an actual or simulated work place after completion of the training module. 7.2 Assessment should be done by NSDA certified assessor.
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Experts Involved on development process of this standard

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

Name	Organization	Designation
Mr. Ahsanullah Hasan	Hameem Group	Group General Manager
Mr. Md. Atikur Rahman	Cutting Edge industries Ltd.	Chief Operating Officer
Engr. Md. Sharif Nowaz	BKMEA	Senior Trainer (PIC Cell) SEIP Project
Mr. Md. Ellius Hossain	Viyellatex Group	Senior Officer
Engr. Abdul Sattar	Axis Group	Head of IE & Planning
Mr. Md. Zobayer Alam	Institute of Science Trade & Technology	HOD
Mr. Md. Amir Hossain	BC SD03 Project	Consultant- RMG Sector
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

First working group formation and competency standard development workshop participants (09th July 2017)

Name	Organization	Designation
Mr. G. M. Faruque	BKMEA	Vice President (finance)
Ms. Rupali Biswas	BKMEA	Chief Coordinator SEIP Project
Mr. Fariduzzaman Bhuiyan Sohel	Knit Asia Ltd. (New Asia Group)	General Manager
Engr. Md. Sharif Nowaz	BKMEA	Senior Trainer (PIC Cell) SEIP Project
Engr. Abdul Sattar	Axis Group	Head of IE & Planning

Mr. Md. Amir Hossain	BC SD03 Project	Consultant- RMG Sector
Mr. Syed Nasir Ershad	SEIP	AEPD (Public-1)
Mr. Md. Ahsan Habib	SEIP	TVET Specialist
Mr. Mohiuzzaman	SEIP	Course Specialist
Mr. Ananda Falia	BTEB	Assistant Controller
Ms. Rashmi Mehra	BC SD03 Project	International Consultant for Development of CBLM
Mr. Syed Azharul Haque	BC SD03 Project	National Subject Matter Consultant- RMG Sector

Validation Workshop

First competency standard validation workshop participants (25th July 2017)

Name	Organization	Designation
Mr. Md. Ashikur Rahman (Tuhin)	RTISC & BGMEA	Director
Mr. Mohammad Zaglul Hayder	SEIP-BGMEA	Chief Coordinator
Mr. Azim Mohammad	SEIP-BKMEA	Senior Trainer
Mr. Md. Sadequr Rahman	Knit Asia Ltd.	Central Planning Manager
Engr. Rupali Biswas	SEIP-BKMEA	Chief Coordinator
Mr. Syed Nasir Ershad	SEIP	AEPD (Public-1)
Mr. Md. Ahsan Habib	SEIP	TVET Specialist
Mr. Mohiuzzaman	SEIP	Course Specialist
Mr. Ananda Falia	BTEB	Assistant Controller

Mr. Md. Amir Hossain	BC SD03 Project	Consultant- RMG Sector
Ms. Rashmi Mehra	BC SD03 Project	International Consultant for Development of CBLM
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.

Respectable members of the SCVC:

Industrial Engineering and Lean Manufacturing, Level - IV		
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