



# Skills for Employment Investment Program (SEIP)

**COMPETENCY STANDARD**

**FOR**

**PATTERN MAKING, GRADING AND CAD-CAM**

**OPERATION**

***(LEATHER AND FOOTWEAR SECTOR)***

**Finance Division, Ministry of Finance  
Government of the People's Republic of Bangladesh**

## Copyright

The Competency Standard for Pattern Making, Grading and CAD-CAM Operation 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 for individuals who graduated through the established standard via competency-based assessment to be suitably qualified for a relevant job.

This document is owned by the Finance Division of the Ministry of Finance of the People's Republic of Bangladesh, developed under the Skills for Employment Investment Program (SEIP).

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

Other interested parties must obtain permission from the owner of this document for reproduction of information in any manner, in whole or in part, of this Competency Standard, in English or other language.

This document is available from:

*Skills for Employment Investment Program (SEIP) Project  
Finance Division  
Ministry of Finance  
Probashi Kallyan Bhaban (Level – 16)  
71-72 Old Elephant Road  
Eskaton Garden, Dhaka 1000  
Telephone: +8802 551 38598-9 (PABX), +8802 551 38753-5  
Facsimile: +8802 551 38752  
Website: [www.seip-fd.gov.bd](http://www.seip-fd.gov.bd)*

## Table of Contents

---

<b>Introduction</b>	<b>4</b>
<b>Overview</b>	<b>5</b>
Experts Involved	6
Development Workshop	6
Validation Workshop	7
<b>Competency Chart</b>	<b>9</b>
A. Generic (basic) Competencies (4 hours)	9
B. Sector-specific (common) Competencies (4 hours)	9
C. Occupation-specific (core) Competencies (72 hours)	9
<b>Units and Elements Table</b>	<b>11</b>
A. Generic (basic) Competencies	11
B. Sector-specific (common) Competencies	11
C. Occupation-specific (core) Competencies	11
<b>Competency Standard</b>	<b>12</b>
A: Generic (basic) Competencies	12
B: Sector-specific (common) Competencies	16
C: Occupation-specific (core) Competencies	19

## Introduction

---

The Skills for Employment Investment Program (SEIP) Project of the Finance Division of the Ministry of Finance has embarked on a project which aims to qualitatively and quantitatively expand the skilling capacity of identified public and private training providers by establishing and operationalising a responsive skill ecosystem and delivery mechanism through a combination of well-defined set of funding triggers and targeted capacity support.

Among the many components of the project, one is to promote a Market Responsive Inclusive Skills Training Delivery programme. Key priority economic growth sectors identified by the government have been targeted by the project to improve current job skills along with up-skilling of the 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. Priority sectors were identified to adopt a demand driven approach to training with effective inputs from Industry Skills Councils (ISC's), employer associations and employers.

This document 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.

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 national and international subject-matter experts, SEIP, BTEB, ISC, and industry experts to identify the competencies required of an occupation in a particular sector.

Competency standards describe the skills, knowledge and attitude needed to perform effectively in the workplace. Competency standards acknowledge that people can achieve technical and vocational competency in many ways by emphasising 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

Identification and validation of units of competency and elements for this occupation were made by experts within this sector. A series of meetings were held to accurately capture industry and employer needs and expectations and develop the competency framework that would help to enhance the employability of the

youth trained. This process started on 12 March 2018 and concluded with a validation workshop with working group on 6 May 2018.

### Experts Involved

Industry and subject-matter experts who provided their valuable inputs to develop this competency standard [March – April 2018]:

Name	Organisation	Designation
Md. Mominul Ahsan	Industry Skills Council (ISC) - Leather & Leather Goods	CEO
Mr. Md. Razya Rahim	Apex Footwear Limited	General Manager- Product Development
Mr. Shamal Chandra Sarkar	Apex Footwear Limited	Assistant General Manager - PD
Mr. Md. Mostofa Shahidul	Apex Footwear Limited	Assistant General Manager- Product Development
Mr. Md. Shahidur Rahman	Apex Footwear Limited	Deputy Manager- Product Development
Mr. Md. Shamim Al-Mamun	Edison Footwear Limited	Manger- Product Development
Mr. Md. Emarat Khan	Edison Footwear Limited	Assistant Manger - Product Development
Mr. Md. Salim Reza	Apex Footwear Limited	Deputy Manager - Product Development (Commercialisation)
Mr. Md. Rakibul Islam	Apex Footwear Limited	Design & Developer (Product Development)
Md. Abu Talha	Leatherex Footwear Limited	Manager (R&D Merchandising)
Md. Golam Shah Newaz	US Bangla Leather Limited	General Manager
Mr. Foysal Hossain	FB Footwear Limited	Production Manager
David King	British Council - SD03	Team Leader
Sobur Ahmed	British Council - SD03	National Subject Matter Consultant- Leather and Footwear

### Development Workshop

Working group formation and competency standard development workshop participants (17 April 2018):

Name	Organisation	Designation
Md. Mominul Ahsan	Industry Skills Council (ISC) - Leather & Leather Goods	CEO
Mr. Md. Golam Shah Newaz	US Bangla Leather Limited	General Manager

Name	Organisation	Designation
Mr. Md. Rakibul Islam	Apex Footwear Limited	Design & Developer (Product Development)
Mr. Md. Emarat Khan	Edison Footwear Limited	Assistant Manager - Product Development
Mr. Raihan Ahmed	Italy Footwear Limited	Assistant Manager (PD, Planning & Merchandising)
Mr. Md. ASM Nasim	LFMEAB-SEIP Project	Lead Trainer
Md. Arifur Rahman Bhuiyan	LFMEAB-SEIP Project	Coordinator - Training, Job Placement and Database
Syed Nasir Ershad	SEIP	AEPD (Public-1)
Md. Ahsan Habib	SEIP	TVET Specialist
Mr. Mohiuzzaman	SEIP	Course Specialist
David King	British Council - SD03	Team Leader
Sobur Ahmed	British Council - SD03	National Subject Matter Consultant- Leather and Footwear

### Validation Workshop

Competency standard validation workshop participants (6 May 2018):

Name	Organisation	Designation
Md. Mominul Ahsan	Industry Skills Council (ISC) - Leather & Leather Goods	CEO
Mr. Md. Golam Shah Newaz	US Bangla Leather Limited	General Manager
Mr. Samoren Ghosh	Royal Footwear Limited	Manager - Product Development
Mr. Md. Rakibul Islam	Apex Footwear Limited	Design & Developer (Product Development)
Mr. Raihan Ahmed	Italy Footwear Limited	Assistant Manager (PD, Planning & Merchandising)
Mr. Md. Mashiur Rahman	LFMEAB-SEIP Project	Chief Coordinator
Mr. Md. Arifur Rahman Bhuiyan	LFMEAB-SEIP Project	Coordinator - Training, Job Placement and Database
Syed Nasir Ershad	SEIP	AEPD (Public-1)
Md. Ahsan Habib	SEIP	TVET Specialist

Name	Organisation	Designation
Mr. Mohiuzzaman	SEIP	Course Specialist
David King	British Council - SD03	Team Leader
Sobur Ahmed	British Council - SD03	National Subject Matter Consultant- Leather and Footwear

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 Chart

Units of Competency	Elements		
---------------------	----------	--	--

### A. Generic (basic) Competencies (4 hours)

Operate in a team environment SEIP-LEA-PAT-01-G	Identify team goals and work processes	Identify own role and responsibilities within the team	Communicate and co-operate with team members
	Practice problem solving within the team		

### B. Sector-specific (common) Competencies (4 hours)

Apply occupational health and safety (OHS) practice in the workplace SEIP-LEA-PAT-01-S	Identify OHS policies and procedures	Apply personal health and safety practices	Report hazards and risks
	Respond to emergencies		

### C. Occupation-specific (core) Competencies (72 hours)

Understand pattern making and CAD-CAM operations SEIP-LEA-PAT-01-O	Describe concept of pattern making	Identify basic requirements for CAD-CAM operations	Identify devices and hardware required for CAD-CAM operations

Carry out manual pattern making operations SEIP-LEA-PAT-02-O	Prepare a mean forme	Develop standard/shell	Cut pattern from standard

Prepare a standard/shell using 3D software SEIP-LEA-PAT-03-O	Digitise last	Develop a standard/shell	

Perform computer aided pattern making operations using 2D software SEIP-LEA-PAT-04-O	Digitise a 2D standard/shell	Create new style lines	Cut piece patterns

Carry out pattern grading SEIP-LEA-PAT-05-O	Identify grading parameters	Carry out grading	Check and cut graded patterns
--	-----------------------------	-------------------	-------------------------------

## Units and Elements Table

### A. Generic (basic) Competencies

Code	Unit of Competency	Elements of Competency	Duration (hours)
SEIP-LEA-PAT-01-G	Operate in a team environment	<ol style="list-style-type: none"> <li>1. Identify team goals and work processes.</li> <li>2. Identify own role and responsibilities within team.</li> <li>3. Communicate and co-operate with team members.</li> <li>4. Perform problem solving within the team.</li> </ol>	4
<b>Total Hours</b>			<b>4</b>

### B. Sector-specific (common) Competencies

Code	Unit of Competency	Elements of Competency	Duration (hours)
SEIP-LEA-PAT-01-S	Apply occupational health and safety (OHS) practice in the workplace	<ol style="list-style-type: none"> <li>1. Identify OHS policies and procedures.</li> <li>2. Apply personal health and safety Practices.</li> <li>3. Report hazards and risks.</li> <li>4. Respond to emergencies.</li> </ol>	4
<b>Total Hours</b>			<b>4</b>

### C. Occupation-specific (core) Competencies

Code	Unit of Competency	Elements of Competency	Duration (hours)
SEIP-LEA-PAT-01-O	Understand pattern making and CAD-CAM operations	<ol style="list-style-type: none"> <li>1. Describe concept of pattern making.</li> <li>2. Identify requirements for CAD-CAM operations.</li> <li>3. Identify devices and hardware required for CAD-CAM operations.</li> </ol>	12
SEIP-LEA-PAT-02-O	Carry out manual pattern making operations	<ol style="list-style-type: none"> <li>1. Prepare a mean forme.</li> <li>2. Develop standard/shell.</li> <li>3. Cut pattern from standard/shell.</li> </ol>	16
SEIP-LEA-PAT-03-O	Prepare a standard/shell using 3D software	<ol style="list-style-type: none"> <li>1. Digitise last.</li> <li>2. Develop a standard/shell.</li> </ol>	16
SEIP-LEA-PAT-04-O	Perform computer aided pattern	<ol style="list-style-type: none"> <li>1. Digitise 2D standard/shell.</li> <li>2. Create new style lines.</li> </ol>	16

Code	Unit of Competency	Elements of Competency	Duration (hours)
	making operations using 2D software	3. Cut piece patterns.	
SEIP-LEA-PAT-05-O	Carry out pattern grading	<ol style="list-style-type: none"> <li>1. Identify grading parameters.</li> <li>2. Perform grading.</li> <li>3. Check and cut graded patterns.</li> </ol>	12
<b>Total Hours</b>			<b>72</b>

## Competency Standard

### A: Generic (basic) Competencies

<b>Unit of Competency:</b> Operate in a team environment	<b>Nominal Duration:</b> 4 hours	<b>Unit Code:</b> SEIP-LEA-PAT-01-G
<b>Unit Descriptor:</b> <p>This unit covers the skills, knowledge and attitudes required to operate in a team environment. It specifically includes team goals and work processes, roles and responsibilities, team communication and problem solving within the team.</p>		

#### Elements and Performance Criteria

Terms in the performance criteria that are written in **bold and underlined** are elaborated in the range of variables.

Elements of Competency	Performance Criteria
1. Identify team goals and work processes	<p>1.1. Roles and objectives of the team are identified and interpreted.</p> <p>1.1. Roles and responsibilities of team members are identified and interpreted.</p>
2. Identify own role and responsibilities within team	<p>2.1. Personal role and responsibilities are identified within the team environment.</p> <p>2.2. Reporting relationships are interpreted within team and external to team.</p>
3. Communicate and co-operate with team members	<p>3.1. Other teammates' tasks are identified and support provided when requested.</p> <p>3.2. The team is encouraged through <b><u>sharing information</u></b> or expertise, working together to solve problems, and putting team success first.</p> <p>3.3. Views and opinions of other team members are interpreted and respected.</p>
4. Practice problem solving within the team	<p>4.1. Problems faced at the individual and team level are identified and showed insight into the root-causes of the problems.</p> <p>4.2. A range of solutions and courses of action are identified together with benefits, costs, and risks associated with each.</p> <p>4.3. The good ideas of others to help develop solutions are recognised and advice sought from those who have solved similar problems.</p> <p>4.4. It is looked beyond the obvious and not stopped at the first answers.</p>

## Range of Variables

Variable	Range ( <i>may include but not limited to</i> )
1. Sharing information	<ul style="list-style-type: none"> <li>1.1. Agenda</li> <li>1.2. Minutes</li> <li>1.3. Progress and incident reports</li> <li>1.4. Operational manuals</li> <li>1.5. Visual and graphic materials</li> <li>1.6. Emails and SMS</li> <li>1.7. Phone directory</li> <li>1.8. Policy, procedure and standards</li> <li>1.9. OHS information</li> </ul>

Curricula Content Guide	
1. Underpinning knowledge	<ul style="list-style-type: none"> <li>1.1. Team goals and work processes</li> <li>1.2. Roles and responsibilities</li> <li>1.3. Finding problems and solving them</li> </ul>
2. Underpinning skills	<ul style="list-style-type: none"> <li>2.1. Identifying own role and responsibility within team</li> <li>2.2. Communicating and co-operating with team members</li> <li>2.3. Demonstrating problem solving within the team</li> </ul>
3. Underpinning attitudes	<ul style="list-style-type: none"> <li>3.1. Active on teamwork</li> <li>3.2. Prompt in carrying out activities</li> <li>3.3. Tidy and punctual</li> <li>3.4. Respectful of peers, subordinates and seniors in the workplace</li> <li>3.5. Sincere and honest concerning duties</li> </ul>
4. Resource implications	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> <li>4.1. Workplace (simulated or actual)</li> <li>4.2. Projector</li> <li>4.3. Stationary</li> <li>4.4. Learning manual</li> </ul>

Assessment Evidence Guide	
1. Critical aspects of competency	<p>Assessment must evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1. identified own role and responsibility within team</li> <li>1.2. communicated and co-operated with team members</li> <li>1.3. demonstrated problem solving within the team</li> </ul>

## Assessment Evidence Guide

### 2. Methods of assessment

Methods of assessment may include but is not limited to:

- 2.1. written test
- 2.2. oral test
- 2.3. observation
- 2.4. demonstration
- 2.5. portfolio

### 3. Context of assessment

3.1. Competency assessment must be done in a training institute or an actual or simulated workplace after completion of this unit of competency.

3.2. Assessment must be done by a suitably qualified/certified assessor.

## B: Sector-specific (common) Competencies

<b>Unit of Competency:</b> Apply occupational health and safety (OHS) practice in the workplace	<b>Nominal Duration:</b> 4 hours	<b>Unit Code:</b> SEIP-LEA-PAT-01-S
<b>Unit Descriptor:</b> This unit covers the skills, knowledge and attitudes required to apply occupational health and safety (OHS) practices in the workplace. It specifically includes identifying OHS policies and procedures, applying personal health and safety practices, reporting hazards and risks and responding to emergencies.		

### Elements and Performance Criteria

Terms in the performance criteria that are written in **bold and underlined** are elaborated in the range of variables.

Elements of Competency	Performance Criteria
1. Identify OHS policies and procedures	1.1. <b><u>OHS policies</u></b> and safe operating procedures are interpreted. 1.2. Safety signs and symbols are identified and followed. 1.3. Response, evacuation procedures and other contingency measures are interpreted correctly.
2. Apply personal health and safety practices	2.1. OHS policies and procedures are applied in the workplace including personal protective equipment (PPE). 2.2. Common health issues are recognised. 2.3. Common safety issues are identified.
3. Report hazards and risks	3.1. Hazards and risks are identified. 3.2. Hazards and risks assessment and controls are interpreted.
4. Respond to emergencies	4.1. Respond to alarms and warning devices. 4.2. <b><u>Emergency response plans and procedures</u></b> are responded to. 4.3. <b><u>First aid procedures</u></b> during emergency situations are identified.

### Range of Variables

Variable	Range ( <i>may include but not limited to</i> )
1. OHS policies	1.1. Organisational OHS policies 1.2. International OHS requirements 1.3. Fire safety rules and regulations
2. Emergency response plans and procedures	2.1. Firefighting procedures 2.2. Earthquake response procedures 2.3. Emergency response plans and procedures 2.4. Medical and first aid



<b>Variable</b>	<b>Range (may include but not limited to)</b>
3. First aid procedure	3.1. Washing of open wound 3.2. Washing chemically infected area 3.3. Applying bandage 3.4. Taking appropriate medicine
4. Personal protective equipment	4.1. Goggles 4.2. Ear muffs 4.3. Ear plugs 4.4. Gloves 4.5. Clothing 4.6. Apron 4.7. Helmet 4.8. Boots

<b>Curricula Content Guide</b>	
1. Underpinning knowledge	1.1. Workplace OHS policies and procedures 1.2. Work safety procedures 1.3. Emergency response procedures: 1.3.1. Firefighting 1.3.2. Earthquake response 1.3.3. Accident response 1.4. Types of hazards (biological, chemical and physical) and their effects 1.5. OHS awareness 1.6. Personal protective equipment (PPE)
2. Underpinning skills	2.1. Identifying OHS policies and procedures 2.2. Applying personal health and safety practices 2.3. Reporting hazards and risks 2.4. Responding to emergencies
3. Underpinning attitudes	3.1. Committed to occupational health and safety practices 3.2. Communicates well with peers, subordinates and seniors in workplace 3.3. Prompt in carrying out activities 3.4. Tidy and punctual 3.5. Sincere and honest concerning duties 3.6. Environmental concern 3.7. Responsible during emergencies

### Curricula Content Guide

#### 4. Resource implications

The following resources must be provided:

- 4.1. Workplace (simulated or actual)
- 4.2. Personal protective equipment (PPE)
- 4.3. Firefighting equipment
- 4.4. Emergency response manual
- 4.5. First aid kits
- 4.6. Stationary
- 4.7. Learning manual

### Assessment Evidence Guide

#### 1. Critical aspects of competency

Assessment must evidence that the candidate:

- 1.1. identified OHS policies and procedures
- 1.2. applied personal health and safety practices (including PPE)
- 1.3. reported hazards and risks
- 1.4. responded to emergencies

#### 2. Methods of assessment

Methods of assessment may include but is not limited to:

- 2.1. written test
- 2.2. oral test
- 2.3. observation
- 2.4. demonstration
- 2.5. portfolio

#### 3. Context of assessment

- 3.1. Competency assessment must be done in a training institute or an actual or simulated workplace after completion of this unit of competency.
- 3.2. Assessment must be done by a suitably qualified/certified assessor.

## C: Occupation-specific (core) Competencies

<b>Unit of Competency:</b> Understand pattern making and CAD-CAM operations	<b>Nominal Duration:</b> 16 hours	<b>Unit Code:</b> SEIP-LEA-PAT-01-O
<p><b>Unit Descriptor:</b></p> <p>This unit covers the skills, knowledge and attitudes required to understand pattern making and CAD-CAM operations. It specifically includes describing the concept behind pattern making, identifying the basic requirements for CAD-CAM operations and identifying devices and hardware required for CAD-CAM operations.</p>		

### Elements and Performance Criteria

Terms in the performance criteria that are written in **bold and underlined** are elaborated in the range of variables.

Elements of Competency	Performance Criteria
1. Describe concept of pattern making	<p>1.1. Basic <b><u>styles of footwear</u></b> are identified.</p> <p>1.2. <b><u>Shoe construction</u></b> is explained and illustrated.</p> <p>1.3. <b><u>Types of lasts</u></b> are identified and categorised.</p> <p>1.4. <b><u>Reference points for last</u></b> are identified.</p> <p>1.5. Concept of pattern making is clearly defined.</p>
2. Identify basic requirements for CAD-CAM operations	<p>2.1. CAD-CAM operations are appropriately identified.</p> <p>2.2. <b><u>Functions of CAD-CAM systems</u></b> are identified and described.</p> <p>2.3. <b><u>Basic CAD-CAM software</u></b> is identified.</p>
3. Identify devices and hardware required for CAD-CAM operations	<p>3.1. <b><u>CAD-CAM devices</u></b> required for effective operation are identified.</p> <p>3.2. Use of <b><u>CAD-CAM hardware</u></b> is carried out correctly.</p>

### Range of Variables

Variable	Range (may include but not limited to)
1. Styles of footwear	<p>1.1. Oxford</p> <p>1.2. Derby</p> <p>1.3. Court</p> <p>1.4. Slip-on</p> <p>1.5. Moccasin</p> <p>1.6. Boot</p> <p>1.7. Sports</p> <p>1.8. Sandals</p>

Variable	Range ( <i>may include but not limited to</i> )
2. Shoe construction	2.1. Cemented 2.2. Welteed 2.3. Moccasin 2.4. String 2.5. Strobel 2.6. Californian
3. Types of last	3.1. Solid block 3.2. Scoop 3.3. V-hinge 3.4. C-hinge 3.5. Telescopic
4. Reference points of last	4.1. Toe point 4.2. Inside ball point 4.3. Outside ball point 4.4. Instep point 4.5. Waist point 4.6. Vamp point 4.7. Seat point 4.8. Back height point 4.9. Feather edge
5. Functions of CAD-CAM systems	5.1. Pattern making 5.2. Digitising 5.3. Pattern engineering 5.4. Grading 5.5. Pattern cutting 5.6. Consumption of materials
6. Basic CAD software	6.1. ShoeMaster 6.2. Crispin 6.3. Romans CAD 6.4. Rhino 6.5. Fast shoe 6.6. Horse shoe 6.7. Dimension 6.8. ICad 3D+

Variable	Range ( <i>may include but not limited to</i> )
7. CAD-CAM devices	7.1. Pointing stick 7.2. Graphics tablet 7.3. Joystick 7.4. Light pen 7.5. Mouse 7.6. Touch pad 7.7. Touch screen 7.8. Image scanner 7.9. Keyboard
8. CAD-CAM hardware	8.1 System unit 8.2 Central processing unit (CPU) 8.3 Memory 8.4 Hard disk 8.5 CD-ROM 8.6 External storage device 8.7 Monitor 8.8 Printer 8.9 Plotter 8.10 Digitiser and puck

Curricula Content Guide	
1. Underpinning knowledge	1.1. Basic styles of footwear and shoe construction 1.2. Types of lasts and their reference points 1.3. Concept of pattern making 1.4. Functions of CAD-CAM system 1.5. CAD-CAM devices and hardware
2. Underpinning skills	2.1. Identifying basic styles of footwear 2.2. Identifying types of lasts and their reference points 2.3. Identifying basic CAD-CAM software, devices and hardware 2.4. Using CAD-CAM hardware
3. Underpinning attitudes	3.1 Commitment to occupational health and safety 3.2 Environment concern 3.3 Eager to learn 3.4 Tidy and punctual 3.5 Respectful of peers, subordinates and seniors in the workplace 3.6 Concerned about the work environment 3.7 Sincere and honest concerning duties 3.8 Communication with peers, sub-ordinates and seniors in workplace

### Curricula Content Guide

#### 4. Resource implications

The following resources must be provided:

- 4.1. Workplace (simulated or actual)
- 4.2. Computer/laptop
- 4.3. CAD-CAM system
- 4.4. Measuring tape
- 4.5. Stationary
- 4.6. Learning manual

### Assessment Evidence Guide

#### 1. Critical aspects of competency

Assessment must evidence that the candidate:

- 1.1. identified basic types of footwear
- 1.2. identified different types of last and their reference points
- 1.3. identified CAD-CAM software, devices and hardware
- 1.4. used CAD-CAM hardware

#### 2. Methods of assessment

Methods of assessment may include but is not limited to:

- 2.1. written test
- 2.2. oral test
- 2.3. observation
- 2.4. demonstration
- 2.5. portfolio

#### 3. Context of assessment

- 3.1. Competency assessment must be done in a training institute or an actual or simulated workplace after completion of this unit of competency.
- 3.2. Assessment must be done by a suitably qualified/certified assessor.

<b>Unit of Competency:</b> Carry out manual pattern making operations	<b>Nominal Duration:</b> 16 hours	<b>Unit Code:</b> SEIP-LEA-PAT-02-O
<b>Unit Descriptor:</b> This unit covers the skills, knowledge and attitudes required to carry out manual pattern making operations. It specifically includes preparing a mean forme, developing a standard/shell and cutting pattern from standard/shell.		

### Elements and Performance Criteria

Terms in the performance criteria that are written in **bold and underlined** are elaborated in the range of variables.

Elements of Competency	Performance Criteria
1. Prepare a mean forme	1.1. Mean forme making process is identified and described. 1.2. Last, pattern paper and masking tape are identified and selected. 1.3. Mean forme making is carried out as per job specification.
2. Develop standard/shell	2.1. <b><u>Types of standard/shell</u></b> are identified 2.2. Upper standard/shell making is performed. 2.3. Lining standard/shell making is carried out.
3. Cut pattern from standard/shell	3.1. Upper piece patterns are cut following upper standard. 3.2. Lining piece patterns are cut following lining standard. 3.3. Reinforcement pattern pieces are cut following upper piece pattern.

### Range of Variables

Variable	Range ( <i>may include but not limited to</i> )
1. Types of standard/shell	1.1 Upper standard/shell 1.2 Lining standard/shell

Curricula Content Guide	
1. Underpinning knowledge	1.1. Mean forme making 1.2. Upper and lining standard/shell making 1.3. Reinforcement pattern pieces making 1.4. Pattern cutting
2. Underpinning skills	2.1. Carrying out mean forme making 2.2. Performing standard/shell making 2.3. Developing reinforcement pattern 2.4. Cutting piece patterns (upper, lining and reinforcement)

<b>Curricula Content Guide</b>	
<b>3. Underpinning attitudes</b>	<ul style="list-style-type: none"> <li>3.1 Commitment to occupational health and safety</li> <li>3.2 Environment concern</li> <li>3.3 Eager to learn</li> <li>3.4 Tidy and punctual</li> <li>3.5 Respectful of peers, subordinates and seniors in the workplace</li> <li>3.6 Concerned about the work environment</li> <li>3.7 Sincere and honest concerning duties</li> <li>3.8 Communication with peers, sub-ordinates and seniors in workplace</li> </ul>
<b>4. Resource implications</b>	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> <li>4.1. Workplace (simulated or actual)</li> <li>4.2. Instruction sheet</li> <li>4.3. Pattern paper</li> <li>4.4. Scissors</li> <li>4.5. Masking tape</li> <li>4.6. Stationary</li> <li>4.7. Learning manual</li> </ul>

<b>Assessment Evidence Guide</b>	
<b>1. Critical aspects of competency</b>	<p>Assessment must evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1. carried out mean forme making correctly</li> <li>1.2. performed upper and lining standard/shell making per job specifications</li> <li>1.3. carried out cutting of piece pattern (upper, lining and reinforcement)</li> </ul>
<b>2. Methods of assessment</b>	<p>Methods of assessment may include but is not limited to:</p> <ul style="list-style-type: none"> <li>2.1. written test</li> <li>2.2. oral test</li> <li>2.3. observation</li> <li>2.4. demonstration</li> <li>2.5. portfolio</li> </ul>
<b>3. Context of assessment</b>	<ul style="list-style-type: none"> <li>3.1. Competency assessment must be done in a training institute or an actual or simulated workplace after completion of this unit of competency.</li> <li>3.2. Assessment must be done by a suitably qualified/certified assessor.</li> </ul>



<b>Unit of Competency:</b> Prepare a standard/shell using 3D software	<b>Nominal Duration:</b> 16 hours	<b>Unit Code:</b> SEIP-LEA-PAT-03-O
<b>Unit Descriptor:</b> This unit covers the skills, knowledge and attitudes required to prepare a standard/shell using 3D software. It specifically includes digitising last and developing standards/shells.		

### Elements and Performance Criteria

Terms in the performance criteria that are written in **bold and underlined** are elaborated in the range of variables.

Elements of Competency	Performance Criteria
1. Digitise last	1.1. A hole on back centre line curve point is made by drill machine as per pin diameter. 1.2. The last is placed on 3D scanning chamber by means of pin hole. 1.3. The <b><u>parameter for scanning</u></b> is set. 1.4. Digitising is carried out. 1.5. Scanned last is converted to 3D last (elast).
2. Develop a standard/shell	2.1. 3D last (elast) is imported/opened. 2.2. The last reference points are selected. 2.3. The guidelines are selected and followed. 2.4. The <b><u>style lines</u></b> are drawn and the standard/shell on 3D last (elast) is completed.

### Range of Variables

Variable	Range ( <i>may include but not limited to</i> )
1. Parameter for scanning	1.1. Scanning zone 1.2. Number of zone 1.3. Number of points per zone 1.4. Percentage of sensitivity
2. Style lines	2.1. Top 2.2. Quarter 2.3. Vamp 2.4. Counter 2.5. Mudguard 2.6. Tongue 2.7. Toe cap 2.8. Backstrap

<b>Curricula Content Guide</b>	
<b>1. Underpinning knowledge</b>	<ul style="list-style-type: none"> <li>1.1. Parameters for scanning</li> <li>1.2. Digitising</li> <li>1.3. Guidelines for last reference points</li> <li>1.4. Style lines</li> </ul>
<b>2. Underpinning skills</b>	<ul style="list-style-type: none"> <li>2.1. Setting the parameter for scanning</li> <li>2.2. Carrying out digitising</li> <li>2.3. Converting scanned last to 3D last (elast)</li> <li>2.4. Selecting the last reference points</li> <li>2.5. Drawing style lines and completing the standard/shell on 3D last (elast)</li> </ul>
<b>3. Underpinning attitudes</b>	<ul style="list-style-type: none"> <li>3.1 Commitment to occupational health and safety</li> <li>3.2 Environment concern</li> <li>3.3 Eager to learn</li> <li>3.4 Tidy and punctual</li> <li>3.5 Respectful of peers, subordinates and seniors in the workplace</li> <li>3.6 Concerned about the work environment</li> <li>3.7 Sincere and honest concerning duties</li> <li>3.8 Communication with peers, sub-ordinates and seniors in workplace</li> </ul>
<b>4. Resource implications</b>	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> <li>4.1. Workplace (simulated or actual)</li> <li>4.2. Computer/laptop</li> <li>4.3. CAD-CAM system</li> <li>4.4. Measurement chart</li> <li>4.5. Plotter</li> <li>4.6. Stationary</li> <li>4.7. Learning manual</li> </ul>

<b>Assessment Evidence Guide</b>	
<b>1. Critical aspects of competency</b>	<p>Assessment must evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1. set the parameter and carried out digitising</li> <li>1.2. converted scanned last to 3D last (elast)</li> <li>1.3. selected the last reference points</li> <li>1.4. drew style lines and completed the standard/shell</li> </ul>

## Assessment Evidence Guide

<b>2. Methods of assessment</b>	Methods of assessment may include but is not limited to: <b>2.1.</b> written test <b>2.2.</b> oral test <b>2.3.</b> observation <b>2.4.</b> demonstration <b>2.5.</b> portfolio
<b>3. Context of assessment</b>	<b>3.1.</b> Competency assessment must be done in a training institute or an actual or simulated workplace after completion of this unit of competency. <b>3.2.</b> Assessment must be done by a suitably qualified/certified assessor.

<b>Unit of Competency:</b> Perform computer aided pattern making operations using 2D software	<b>Nominal Duration:</b> 16 hours	<b>Unit Code:</b> SEIP-LEA-PAT-04-O
<b>Unit Descriptor:</b> This unit covers the skills, knowledge and attitudes required to perform computer aided pattern making operations. It specifically includes digitising 2D standards/shells, creating new style lines and cutting piece patterns.		

### Elements and Performance Criteria

Terms in the performance criteria that are written in **bold and underlined** are elaborated in the range of variables.

Elements of Competency	Performance Criteria
1. Digitise 2D standard/shell	1.1. Standard/shell is developed and prepared for digitising, either manually or by 3D software. 1.2. Digitising tablet is initialised. 1.3. Simple and advanced style lines are digitised.
2. Create new style lines	2.1. New style lines are created. 2.2. Duplicate line is created. 2.3. New offset line is made. 2.4. Tied offset line is prepared. 2.5. Mirror line and tied mirror line is created. 2.6. <b><u>Line modification</u></b> is carried out.
3. Cut piece patterns	3.1. Working sequence of CAD-CAM is identified. 3.2. Punches are created and saved. 3.3. New piece is created. 3.4. <b><u>Pattern engineering</u></b> is carried out. 3.5. Final piece pattern making is completed. 3.6. Piece pattern is cut using CAM.

### Range of Variables

Variable	Range ( <i>may include but not limited to</i> )
1. Line modification	1.1. Edit nodes 1.2. Modify nodes 1.3. Modify line 1.4. Smoothen line 1.5. Tide/offset line 1.6. Join line 1.7. Split line 1.8. Extended line 1.9. Mirror line

Variable	Range ( <i>may include but not limited to</i> )
2. Pattern engineering	2.1. Allowance (lasting, setting/underlay, folding, seam, trimming) 2.2. Punch (eyelet punch, decorative punch, branding of shoe) 2.3. Marking (setting, stitch marking, in/out mark, centre mark, chamfer cut for setting on folding) 2.4. Text (size, piece name, style name, article name, date, design name)

Curricula Content Guide	
1. Underpinning knowledge	1.1. Digitise 2D standard/shell 1.2. Style lines and line modification 1.3. Working sequence of CAD-CAM 1.4. Pattern engineering 1.5. Piece pattern cutting
2. Underpinning skills	2.1. Digitising 2D standard/shell 2.2. Creating, duplicating and making style and offset lines 2.3. Performing pattern engineering 2.4. Cutting piece patterns using plotter
3. Underpinning attitudes	3.1 Commitment to occupational health and safety 3.2 Environment concern 3.3 Eager to learn 3.4 Tidy and punctual 3.5 Respectful of peers, subordinates and seniors in the workplace 3.6 Concerned about the work environment 3.7 Sincere and honest concerning duties 3.8 Communication with peers, sub-ordinates and seniors in workplace
4. Resource implications	The following resources must be provided: 4.1. Workplace (simulated or actual) 4.2. Computer/laptop 4.3. CAD-CAM system 4.4. Plotter 4.5. Measurement chart 4.6. Stationary 4.7. Learning manual

## Assessment Evidence Guide

<b>1. Critical aspects of competency</b>	Assessment must evidence that the candidate: <b>1.1.</b> digitised 2D standard/shell <b>1.2.</b> created and duplicated style lines <b>1.3.</b> created offset lines <b>1.4.</b> performed pattern engineering <b>1.5.</b> carried out cutting of piece pattern using plotter
<b>2. Methods of assessment</b>	Methods of assessment may include but is not limited to: <b>2.1.</b> written test <b>2.2.</b> oral test <b>2.3.</b> observation <b>2.4.</b> demonstration <b>2.5.</b> portfolio
<b>3. Context of assessment</b>	<b>3.1.</b> Competency assessment must be done in a training institute or an actual or simulated workplace after completion of this unit of competency. <b>3.2.</b> Assessment must be done by a suitably qualified/certified assessor.

<b>Unit of Competency:</b> Perform pattern grading	<b>Nominal Duration:</b> 12 hours	<b>Unit Code:</b> SEIP-LEA-PAT-05-O
---	--------------------------------------	--

**Unit Descriptor:**

This unit covers the skills, knowledge and attitudes required to carry out pattern grading. It specifically includes identifying grading parameters, performing grading and, checking and cutting graded patterns.

**Elements and Performance Criteria**

Terms in the performance criteria that are written in **bold and underlined** are elaborated in the range of variables.

Elements of Competency	Performance Criteria
1. Identify grading parameters	1.1. <b><u>Grading parameters</u></b> are identified and defined. 1.2. Setting rules and default grade type are followed. 1.3. Grade setting, and shell grade rules are followed and maintained. 1.4. Measurement differences between the sizes are calculated and recorded.
2. Carry out grading	2.1. <b><u>Grading rules</u></b> are selected and parameters are applied. 2.2. Model size and size range is selected. 2.3. Dialog box is followed as per job specification.
3. Check and cut graded patterns	3.1. Restriction grading areas are checked. 3.2. Pattern engineering points are followed. 3.3. Graded patterns are prepared and saved. 3.4. Graded patterns are cut using CAM.

**Range of Variables**

Variable	Range ( <i>may include but not limited to</i> )
1. Grading parameters	1.1. Stick length 1.2. Bottom length 1.3. Ball girth 1.4. Upper girth 1.5. Bottom width 1.6. Length increment 1.7. Girth increment
2. Grading rules	2.1. English/UK system 2.2. Paris point/French system 2.3. Japanese system 2.4. US system

<b>Curricula Content Guide</b>	
<b>1. Underpinning knowledge</b>	<ul style="list-style-type: none"> <li>1.1. Grading parameters</li> <li>1.2. Grading rules</li> <li>1.3. Size ranges</li> <li>1.4. Restricted grading areas</li> <li>1.5. Pattern engineering points</li> </ul>
<b>2. Underpinning skills</b>	<ul style="list-style-type: none"> <li>1.1 Calculating difference between sizes</li> <li>1.2 Identifying and selecting grading rules</li> <li>1.3 Applying grading parameters</li> <li>1.4 Checking restricted grading areas</li> <li>1.5 Following pattern engineering points</li> <li>1.6 Cutting graded patterns using plotter</li> </ul>
<b>2. Underpinning attitudes</b>	<ul style="list-style-type: none"> <li>3.1 Commitment to occupational health and safety</li> <li>3.2 Environment concern</li> <li>3.3 Eager to learn</li> <li>3.4 Tidy and punctual</li> <li>3.5 Respectful of peers, subordinates and seniors in the workplace</li> <li>3.6 Concerned about the work environment</li> <li>3.7 Sincere and honest concerning duties</li> <li>3.8 Communication with peers, sub-ordinates and seniors in workplace</li> </ul>
<b>4. Resource implications</b>	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> <li>4.1 Workplace (simulated or actual)</li> <li>4.2 Computer/laptop</li> <li>4.3 CAD-CAM system</li> <li>4.4 Measurement chart</li> <li>4.5 Plotter</li> <li>4.6 Stationary</li> <li>4.7 Learning manual</li> </ul>

<b>Assessment Evidence Guide</b>	
<b>1. Critical aspects of competency</b>	<p>Assessment must evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 selected grading rules</li> <li>1.2 applied grading parameters</li> <li>1.3 checked restricted grading areas</li> <li>1.4 followed pattern engineering points</li> <li>1.5 cut graded patterns using plotter</li> </ul>



## Assessment Evidence Guide

<b>2. Methods of assessment</b>	Methods of assessment may include but is not limited to: <b>2.1</b> written test <b>2.2</b> oral test <b>2.3</b> observation <b>2.4</b> demonstration <b>2.5</b> portfolio
<b>3. Context of assessment</b>	<b>3.1</b> Competency assessment must be done in a training institute or an actual or simulated workplace after completion of this unit of competency. <b>3.2</b> Assessment must be done by a suitably qualified/certified assessor.