

CAD/CAM OPERATOR

Competency Standards

National Vocational
Certificate Level 3

Version 1 - Dec 2014

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Author

Ms. Mehwish Ahsan (HOI – Milange Institute Lahore)

Responsible

Director General Skills Standard and Curricula, National Vocational and Technical Training Commission
National Deputy Head, TVET Reform Support Programme, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

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Competency Standards: CAD/CAM OPERATOR (APPAREL/TEXTILE)

Title A: DEMONSTRATE KNOWLEDGE OF BASIC COMPUTER OPERATIONS

Overview: This competency standard identifies the basic knowledge of computer, hardware, software, various applications and troubleshooting including installation of third party hardware and software in accordance to industry requirements of the textile/apparel industry for CAD/CAM operators.

Competency Unit	Performance Criteria	Knowledge and Understanding
<p>A1 – Demonstrate knowledge of computer hardware and software.</p>	<p>Trainee will be able to:</p> <p>P1. Demonstrate knowledge of the use of basic computer applications using fundamental components of a computer system.</p> <p>P2. Demonstrate knowledge of basic computer operations including file saving, data retrieval and data back up</p> <p>P3. Demonstrate knowledge of computer hardware types</p>	<p>You must know and understand:</p> <p>K1. Different applications, interfaces and their versions related to their need</p> <p>K2. Various computer peripherals e.g. Keyboard, Monitor, Mouse, Printer, RAM, HDD, VGA, ROMs and Cables</p> <p>K3. Different operating systems used for pattern making</p>

Competency Unit	Performance Criteria	Knowledge and Understanding
<p>A2 – Demonstrate knowledge of attaching CAD/CAM devices to computer system</p>	<p>Trainee will be able to:</p> <p>P1. Demonstrate knowledge of methods of attaching CAD/CAM devices to computer.</p> <p>P2. Follow appropriate safety procedures when attaching CAD/CAM devices to the computer systems.</p> <p>P3. Troubleshoot different issues related to using CAD/CAM devices and drivers.</p>	<p>You must know and understand:</p> <p>K1. Available range of CAD/CAM devices</p> <p>K2. Compatibility issues related to computer software and hardware.</p> <p>K3. OHS precautions when using CAD/CAM devices</p> <p>K4. Issues which may arise with use of CAD/CAM devices and drivers and methods of correcting them</p>

Title B: MANAGE SYSTEMS

Overview: The competency standard identifies the knowledge and skills needed to manage different software tools and processes for storage and maintenance of client records, measurement results and files in soft and hard formats.

Competency Unit	Performance Criteria	Knowledge and Understanding
<p>B1. Create a storage area for client record</p>	<p>Trainee will be able to:</p> <p>P1. Collect client details for creation of a storage area</p> <p>P2. Follow CAD/CAM Explorer requirements to create storage area for client</p> <p>P3. Input client details and save into created client storage area</p>	<p>You must know and understand:</p> <p>K1. Safe management of client storage area and records</p> <p>K2. Use of CAD/CAM Explorer</p>
<p>B2. Establish user environment for client storage area</p>	<p>Trainee will be able to:</p> <p>P1. Select appropriate user environment from CAD/CAM Explorer</p> <p>P2. Choose metric or imperial measurement system according to client requirements</p> <p>P3. Ensure user environment is saved to meet client requirements</p>	<p>You must know and understand:</p> <p>K1. CAD/CAM User environments</p> <p>K2. Metric and imperial measurement systems</p> <p>K3. Importance of saving all work</p> <p>K4. Importance of saving client records to meet client user environment</p>

Competency Unit	Performance Criteria	Knowledge and Understanding
<p>B3. Make annotations to pattern</p>	<p>Trainee will be able to:</p> <p>P1. Create marker annotations for different pattern type, model, and additional client order requirements</p> <p>P2. Stamp marker or piece to identify client and client pattern requirements using standard software coding</p>	<p>You must know and understand:</p> <p>K1. Pattern annotations</p> <p>K2. Client annotation requirements</p> <p>K3. Standard software coding for pattern annotation</p>
<p>B4. Create notches in patterns</p>	<p>Trainee will be able to:</p> <p>P1. Set parameters of notches according to tech pack</p> <p>P2. Make different type and size of notches on pattern according to client requirements</p> <p>P3. Apply notch type and size to pattern according to tech pack</p>	<p>You must know and understand:</p> <p>K1. Size and type of notches</p> <p>K2. Importance of technical pack (tech pack) and purpose</p>
<p>B5. Apply lay limits</p>	<p>Trainee will be able to:</p> <p>P1. Set lay limits according to single, double or tubular ply requirements</p> <p>P2. Identify the limits of piece placement on fabric</p> <p>P3. Save data to designated client storage area according to workplace procedures</p>	<p>You must know and understand:</p> <p>K1. Importance of lay limits to pattern making</p> <p>K2. Lay limits for single, double, and tubular ply fabrics</p>

Title C: DIGITISE PATTERNS

Overview: The competency standard identifies knowledge and skills required for digitising patterns that have been made manually. It enables the learner to apply this process to achieve the digitized patterns as final outcome in the end of this unit.

Competency Unit	Performance Criteria	Knowledge and Understanding
<p>C1 Start digitising procedure</p>	<p>Trainee must be able to:</p> <p>P1. Ensure CAD/CAM software is installed and functioning correctly</p> <p>P2. Turn the digitiser equipment on</p> <p>P3. Check the equipment is working</p>	<p>You must know and understand:</p> <p>K1: Basic pattern and garment types</p> <p>K2. Interpretation of pattern parts and components</p> <p>K3: Digitiser tools and how to operate them, including:</p> <ul style="list-style-type: none"> • Digitiser cursor • Digitiser table • Digitiser function keys and menu bar
<p>C2 Operate digitiser to digitise the pattern</p>	<p>Trainee must be able to:</p> <p>P1. Place pattern on the designated area on the digitiser according to the grain line</p> <p>P2. Ensure the pattern is not wrinkled or creased before placing on the digitiser.</p> <p>P3. Use different function keys from the menu and cursor to</p>	<p>You must know and understand:</p> <p>K1: Placement of pattern on digitiser table</p> <p>K2: Pattern name, category, description and rule table</p> <p>K3: Pattern grading points and notches</p>

	<p>digitize pattern.</p> <p>P4. Ensure all points of the pattern are marked using the cursor.</p> <p>P5. Return the cursor to its prescribed holder at the conclusion of the digitising procedure.</p>	
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Title D: GRADE PATTERNS

Overview: The competency standard identifies the knowledge and skills needed to create different size charts of a base pattern to meet specified customer requirements.

Competency Unit	Performance Criteria	Knowledge and Understanding
<p>D1: Create rule table</p>	<p>Trainee will be able to:</p> <p>P1. Set user environment</p> <p>P2. Read and interpret the relevant size charts</p> <p>P3. Input dimensions into rule table for sizes required according to tech pack</p> <p>P 4. Complete rule table by inputting all required sizes</p> <p>P5. Complete the rule table by inserting values of x and y axes according to tech pack</p>	<p>You must know and understand:</p> <p>K1. Different sizes required by customer (S/M/L, etc.)</p> <p>K2. Principles of grading</p> <p>K3. Metric and imperial measurements</p> <p>K4. Rule table and how to create and apply knowledge</p> <p>K5. Technical package</p>
<p>D2. Apply rule table for grading</p>	<p>Trainee will be able to:</p> <p>P1. Select required digitised pattern piece for grading.</p> <p>P2. Apply appropriate rule table to show grading using function key</p>	<p>You must know and understand:</p> <p>K1.Grading rules</p> <p>K2.Use of axes x and y</p> <p>K3.Use of software programme commands</p> <p>K4.Application of rule tables</p> <p>K5.Rule verification procedures for correct grading</p>

Competency Unit	Performance Criteria	Knowledge and Understanding
	<p>P3. Use command 'Show Nest All' from menu to view graded piece</p> <p>P4. Verify applied grading and adjust variances as required</p> <p>P5. Use 'Export Rule' command to check all rules have been applied correctly to all parts</p> <p>P6. Save graded pattern to designated storage area according to workplace procedures</p>	
<p>D3. Make model for complete garment</p>	<p>Trainee will be able to:</p> <p>P1. Check all pattern pieces required for a complete garment exist following digitising of pattern pieces</p> <p>P2. Select quantity of garment parts from designated storage area for marker making</p> <p>P3. Select fabric lay type according to client requirements</p> <p>P4. Use commands as required to place pattern pieces on fabric.</p> <p>P5. Insert fabric type and piece, and flip quantities and add piece</p>	<p>You must know and understand:</p> <p>K1. Procedures to check pattern pieces required for a complete garment</p> <p>K2. Different options for model making</p> <p>K3. Flipping of pattern piece on different axes (x, y)</p>

Competency Unit	Performance Criteria	Knowledge and Understanding
<p>D4. Complete order process</p>	<p>Trainee will be able to:</p> <p>P1. Collect all data required to process marker</p> <p>P2. Select model, size breakdown and quantities required to process marker</p> <p>P3. Complete order for marker by using 'Save and Process' command to designated storage area</p>	<p>You must know and understand:</p> <p>K1. Available width of fabric for cutting</p> <p>K2. Quantities and sizes of garment</p>

Title E: CREATE MARKER MAKING

Overview: The competency standard identifies the knowledge and skills required to create marker sets, in accordance with the technical pack, using the CAD/CAM software.

Competency Unit	Performance Criteria	Knowledge and Understanding
<p>E1. Draw marker using CAD/CAM software</p>	<p>Trainee must be able to:</p> <p>P1. Select order name from CAD/CAM Explorer's drop-down menu for marking</p> <p>P2. Drag and drop pieces to marker space from model display</p> <p>P3. Adjust pieces as required to achieve optimal usage of available fabric</p> <p>P4. Verify number of pieces according to required garment sizes and quantities</p> <p>P5. Save marker to designated storage area</p>	<p>You must know and understand:</p> <p>K1. Drag and drop technique for laying out pattern pieces in CAD/CAM screen environment</p> <p>K2. Maximising usage of available fabric</p> <p>K3. Verification procedures for marker</p> <p>K4. Different directional commands for marker making (flip, rotate, tilt, etc.)</p>
<p>E2. Send marker to plotter</p>	<p>Trainee must be able to:</p> <p>P1. Ensure plotter is correctly attached to CAD/CAM system</p> <p>P2. Check paper width in plotter matches fabric</p>	<p>You must know and understand:</p> <p>K1. Correct connection of plotter to CAD/CAM system</p> <p>K2. Roll paper widths commonly used in plotters</p> <p>K3. Plotting commands</p>

Competency Unit	Performance Criteria	Knowledge and Understanding
	width P3. Action 'plot' command to send completed marker to plotter or automatic cutting machine	

Title F: OBSERVE OCCUPATIONAL HEALTH AND SAFETY (OHS) PRECAUTIONS

Overview: The competency standard identifies the knowledge, skills and training in the theories and practices of health safety and security precautions required for a safe working environment.

Competency Unit	Performance Criteria	Knowledge and Understanding
<p>F1 - Meet workplace health safety and security requirements for a safe working environment</p>	<p>Trainee will be able to:</p> <p>P1. Maintain a safe working environment and safe system to work.</p> <p>P2. Use and maintain machinery, equipment, appliances and tools in a safe working condition.</p> <p>P3. Make available information as necessary to ensure that everyone is safe from injury and risks to health.</p>	<p>You must know and understand:</p> <p>K1. Requirements for a safe working environment</p> <p>K2. Ergonomics suitable for the work environment</p> <p>K3. Maintenance procedures for machinery, equipment, appliances, tools</p>
<p>F2 - Follow workplace health, safety and security procedures</p>	<p>Trainee will be able to:</p> <p>P1. Report hazardous situations, fatalities, injuries and illness.</p> <p>P2. Control and minimise the risks to ensure that injury or illness is prevented.</p>	<p>You must know and understand:</p> <p>K1. Hazard Identification processes</p> <p>K2. Risk assessment and control processes</p> <p>K3. Precautionary measures and their utilisation to prevent health damages.</p>

Competency Unit	Performance Criteria	Knowledge and Understanding
<p>F3 – Maintain own safe work area.</p>	<p>Trainee will be able to:</p> <p>P1. Demonstrate ability to handle cables related operations appropriately.</p> <p>P2. Install electronic devices at a manageable distance as per industry requirements.</p> <p>P3. Handle sharp implements or tools properly.</p> <p>P4. Maintain safe distances between self and machinery, and machine-to-machine.</p> <p>P5. Use appropriate accessories and tools.</p>	<p>You must know and understand:</p> <p>K1. Use and handling of electronic equipment</p> <p>K2. Precautions to minimise electrical risks.</p>
<p>F4 - Deal with emergency situations.</p>	<p>Trainee will be able to:</p> <p>P1. Ensure inexperienced workers in the performance of any hazardous work receive the necessary supervision.</p> <p>P2. Provide instructions to ensure that everyone is safe in emergency situations.</p> <p>P3. Provide first aid if required.</p>	<p>You must know and understand:</p> <p>K1. Emergency situations and how to deal with it.</p> <p>K2. Location of First Aidbox</p> <p>K3. Identify and locate trained First Aide responder</p>

Title G: DEVELOP PROFESSIONALISM

Overview: The competency standard identifies the differences between professionalism and being professional. Being professional means ensuring appearance, manner, communication, interacting, attitudes, approach, skills, and openness to grow are developed. Professionalism is a combination of taught aspects, such as knowledge and skills, and learning gained through experience.

Competency Unit	Performance Criteria	Knowledge and Understanding
<p>G1 - Communicate with co-workers</p>	<p>Trainee will be able to:</p> <p>P1. Communicate within a department.</p> <p>P2. Communication with other departments.</p> <p>P3. Dealing with vendors.</p> <p>P4. Interaction with other organisations.</p> <p>P5. Using various media to communicate effectively.</p>	<p>You must know and understand:</p> <p>K1. Effectively communication within and without the organisation.</p> <p>K2. How to deal with vendors and the other organisations.</p> <p>K3. Appropriate use of electronic and relative media when required</p>
<p>G2 - Manage Time</p>	<p>Trainee will be able to:</p> <p>P1. Manage time to complete the assigned work.</p> <p>P2. Manage workload as per task.</p> <p>P3. Check work regularly to ensure accuracy for given task.</p> <p>P4. Handle time division with co-workers.</p>	<p>You must know and understand:</p> <p>K1. Importance of managing time according to task priorities, involving management and co-workers</p>

Competency Unit	Performance Criteria	Knowledge and Understanding
G3 - Upgrade Skills	Trainee will be able to: P1. Participate in skill tests P2. Attend seminars / workshops. P3. Participate in competitions time to time. P4. Perform market research. P5. Analyse upcoming market trends.	You must know and understand: K1. Importance of trends and market research to work role K2. Development of skill sets over time by way of seminars, workshops and competitions.
G4 - Keep the workplace clean	Trainee will be able to: P1. Keep their workplace organised. P2. Ensure clean working environment.	You must know and understand: K1. Requirements of a clean and organised workplace K2. Effective and efficient organisation of work area
G5 - Work in a team	Trainee will be able to: P1. Show the good team skills. P2. Take an appropriate appearance. P3. Show comfort and tolerance. P4. Present and observe good work ethics.	You must know and understand: K1. Importance of being a good team player K2. Workplace requirements for dress and appearance K3. Work ethics of the workplace

LIST OF TOOLS AND EQUIPMENT

(Anticipated Class size: 25 trainees)

25 copies per class	Text book(s)/Manuals for this course
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Tools and Equipment

(Class size: 25 trainees)

26	Japanese Scales
26	French Curves
26	Set Squares
26	Measurement tapes
26	Computers
1	Scanner
1	Printer
1	Multimedia Projector
1	Internet Connection

On each computer	<p>Software</p> <ul style="list-style-type: none">• Microsoft® Office (any version)- Enterprise Edition• Microsoft® Windows 8 or above• Latest CAD/CAM Software
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List of consumables

- Notebooks
- CDs Rewriteable
- Photocopy Papers
- Ball pens
- Pencils
- Erasers
- Sharpeners
- Board Markers
- Plastic files
- Flip chart papers
- Pin-board pins
- Whiteboard
- Whiteboard Eraser
- Paper knives
- Glue sticks
- Paper clips
- Scissors
- Punching machines
- Patter Sheets
- Tracing Papers

National Vocational and Technical Training Commission (NAVTTTC)

 5th Floor Evacuee Trust Complex Sector F-5/1, Islamabad.

 +92 51 9044 04

 +92 51 9044 04

 info@navttc.org

 www.navttc.org