Government of Pakistan

**National Vocational and Technical Training Commission**

**Prime Minister’s Youth Skills Development Program**



**Course Contents / Lesson Plan**

**Course Title: CAD/CAM Computerized Gloves**

**Pattern Making**

**Duration:** **6 Months**

|  |  |
| --- | --- |
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| **Trainer Name** |  |
| **Course Title** | **CAD/CAM Computerized Gloves Pattern Making** |
| Objectives and Expectations  | **Employable skills and hands-on practice in CAD/CAM Computerized Gloves Pattern Maker**This 6-month program is designed to equip trainees with comprehensive knowledge and practical skills in computerized gloves pattern making using CAD/CAM technology. The course focuses on integrating traditional pattern-making principles with modern digital tools and industry best practices. Trainees will gain expertise in designing and developing glove patterns through specialized software, enabling them to meet the precision, speed, and quality demands of the international leather industry. The program also emphasizes entrepreneurship, preparing learners for both employment and self-employment opportunities in the leather manufacturing sector.**Main Expectations:****i. Digital Technical Proficiency:**Trainees will develop mastery in using CAD/CAM software for drafting, editing, and finalizing glove patterns. They will understand digital workflows, file management, software tools, and output formats compatible with cutting machines and production systems.**ii. Innovation & Digital Design Sensibility:**Trainees will learn to create functional and aesthetically appealing glove designs by leveraging digital tools. They will be able to adapt and customize patterns in response to customer needs, fashion trends, and ergonomic considerations using advanced design techniques.**iii. Industry and Market Readiness:**Trainees will explore the dynamics of global leather goods markets, including CAD file specifications for export, digital documentation, and industry quality standards. They will gain knowledge of automated production environments and their integration with CAD/CAM systems.**iv. Professionalism & Digital Work Ethics:**The program promotes discipline, digital workspace organization, data integrity, and collaboration within design teams. Trainees will also be introduced to digital safety protocols, copyright considerations, and ethical practices in computerized design environments.**v. Employability & Entrepreneurship Focus:**Graduates will be equipped to enter CAD/CAM departments in leather industries or establish tech-enabled glove pattern design services. They will be trained in freelancing, digital portfolio development, and client communication to support both local and export-oriented ventures. |
| Entry-level of trainees | Matriculation with basic knowledge of computer |
| Teacher’s Eligibility Criteria | Intermediate with at least 5 years industry experience as CAD/CAM computerized gloves pattern maker in relevant field ORBachelors in Textile Designing with at least 3 years industry experience in relevant field |
| **Learning Outcomes of the course** | By the end of this course, trainee will be able to:* Perform basic computer operations
* Understand glove types and pattern types
* Understand components of gloves
* Take measurements of samples
* Draw manual sketches of front base, back base, fourchette, thumb and cuff.
* Operate gloves CAD software
* Maintain data on gloves CAD software
* Trace pattern on gloves CAD software
* Perform gloves grading on gloves CAD software
* Perform nesting and cutting in flatbed cutter
 |
| **­­­Course Execution Plan** | * Total Duration of the Course**:**
* Class Hours: **4 hours per day**
* Theory: **20%**
* Practical: **80%**
* Weekly Hours: **20 hours per week**
* Total Contact Hours: **520 hours**
 |
| **Companies offering jobs in the respective trade** | * Leather industry
* Gloves Industry
* Sports Industry
* Nizam sons
* Silver star
* Leather field
* Cobija Industries
* Seminar Industries
 |
| **Job Opportunities** | * CAD/CAM Computerized Pattern Master
* Supervisor
* Quality Inspector
 |
| **No of Students** | 25 |
| **Learning Place** | Classroom / Lab |
| **Instructional Recourses** | **Learning Resources:*** Online Videos
* Google Search
* Factory Visits
* Course Curriculum
* Online Learning Platforms (Udemy, Linkedln)

**Books and References:**1. **" *CAD in Clothing and Textiles*” by** **Winifred Aldrich**

**Description**: This book provides an excellent foundation in using CAD for pattern making and textile design. While not glove-specific, it thoroughly explains the principles of digital pattern drafting and grading, which are essential for computerized glove pattern development. It also explores the integration of CAD/CAM in fashion and leather industries. |

**MODULES**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Scheduled Weeks** | **Module Title** | **Days** | **Learning Units** | **Home Assignment** |
| **Week 1** | **Develop Basic****Communication Skills**  | Day 1 | Coordinate with Assistants | * **Task 1**

**Coordinate with the assistant and report their progress to supervisor** |
| Day 2 | Report tasks with Supervisor |
| Day 3 | Instruct and Collaborate with Stitchers |
| Day 4 | Coordinate requirements with Glove Cutters |
| Day 5 | Interact with clients* Types of clients
 |
| **Week 2** | **Follow Health & Safety** | Day 1 | Apply Personal Safety* Ergonomic postures
 | * **Task 2**

**Perform basic first aid for minor injury.** |
| Day 2 | * Apply Workplace Safety
 |
| Day 3 | Apply Safety for tools and equipment |
| Day 4 | Use Fire Extinguisher* PASS procedure
* Types of fire extinguishers
 |
| Day 5 | Give First Aid for Minor Injury * Introduction to first aid box

Procedure of First Aid |
| **Week 3** | **Take Measurements** | Day 1 | Introduction of Gloves* Type of gloves
* Type of gloves material
 | * **Task 3**

**Take measurement of sample provided.** |
| Day 2 | Introduction of Pattern |
| Day 3 | Select Proper Instrument* Introduction to leather tools
 |
| Day 4 | Take Sample/Sketch for Pattern |
| Day 5 | Take Measurements of Pattern* Measuring systems and units
 |
| **Week 4** | **Take Measurements** | Day 1 | Record Measurements of Pattern* Types of Patterns
 | * **Task 4**

**Draw geometrical shapes on cardboard.*** **Task 5**

**Draw straight lines on cardboard.** |
| Day 2 | Draw Lines* Types of lines
 |
| Day 3 | Draw Geometrical shapes* Types of geometrical shapes
 |
| Day 4 | Draw Perspective views |
| Day 5 | Introduction to Design* Anatomy of Hand
 |
| **Week 5** | **Draw Sketch of Front Base**  | Day 1 | Draw Front Base of 707 Gloves* Pattern of palm
 | * **Task 6**

**Prepare sketch for the front base of the required gloves.** |
| Day 2 | Draw Front Base of Dress Gloves |
| Day 3 | Draw Front Base of Hockey Gloves |
| Day 4 | Draw Front Base of Cycle Gloves |
| Day 5 | Draw Front Base of Fashion Gloves |
| **Week 6** | **Draw Sketch of Back Base**  | Day 1 | Draw Back Base of 707 Gloves | * **Task 7**

**Prepare sketch for the back base of required gloves.** |
| Day 2 | Draw Back Base of Dress Gloves |
| Day 3 | Draw Back Base of Hockey Gloves |
| Day 4 | Draw Back Base of Cycle Gloves |
| Day 5 | Draw Back Base of Fashion Gloves |
| **Week 7** | **Draw Sketch of Fourchette** | Day 1 | Draw Fourchette of 707 Gloves | * **Task 8**

**Prepare sketch for fourchette of required gloves.** |
| Day 2 | Draw Fourchette of Dress Gloves |
| Day 3 | Draw Fourchette of Hockey Gloves |
| Day 4 | Draw Fourchette of Cycle Gloves |
| Day 5 | Draw Fourchette of Fashion Gloves |
| **Week 8** | **Draw Sketch of Thumb and Cuff** | Day 1 | Draw Thumb of 707 Gloves | * **Task 9**

**Prepare sketch for thumb and cuff of required gloves.** |
| Day 2 | Draw Thumb of Dress Gloves |
| Day 3 | Draw Thumb of Hockey Gloves |
| Day 4 | Draw Thumb of Cycle Gloves |
| Day 5 | Draw Thumb of Fashion GlovesDraw Cuff of Gloves |
| **Week 9** | **Draw Lining Pattern for Shell** | Day 1 | Draw Pattern of Liner for Front base* Pattern of lining for shell
 | * **Task 10**

**Prepare sketch for lining of required gloves** |
| Day 2 | Draw Pattern of Liner for Back Base |
| Day 3 | Draw Pattern of Liner for Fourchette |
| Day 4 | Draw Pattern of Liner for Thumb |
| Day 5 | Draw Pattern for Trank Lining |
| **Week 10** | **Perform Basic Computer Operations** | Day 1 | Identify Computer Hardware* Introduction to Hardware
* Basic Computer components
 | * **Task 11**

**Turn on the computer and install Richpeace or any other CAD software.** |
| Day 2 | Identify Computer Hardware* Peripherals and ports
* Input and output Devices

Troubleshoot Basic Computer Issues |
| Day 3 | Perform Basic Configuration of Computer Systems* Introduction to software
* Drivers
 |
| Day 4 | Perform Software Installation* Software acquisition
* Software installation
* Setup wizard
 |
| Day 5 | Demonstrate Internet Use * Web navigation
* Internet browsers
* Google search
 |
| **Week 11** | **Operate CAD Gloves Software** | Day 1 | Introduction of CAD Gloves software* Richpeace Gloves software
 | * **Task 12**

**Attach scanner to CAD gloves software.** |
| Day 2 | Identify Segment of CAD Gloves software |
| Day 3 | Attach Equipment to CAD Gloves software* Scanner
* Flatbed cutter/ Plotter
 |
| Day 4 | Verify Calibration of Scanner with CAD Gloves Software |
| Day 5 | Verify Calibration of Flatbed Cutter with CAD Gloves software |
| **Week 12** | **Operate CAD Gloves Software** | Day 1 | Introduction to DGS Segment CAD Gloves Interface | * **Task 13**

**Set preference of gloves CAD software.** |
| Day 2 | Introduction to GMS Segment CAD Gloves Interface |
| Day 3 | Identify Tools of CAD Gloves DGS software  |
| Day 4 | Set Units of CAD Gloves software |
| Day 5 | Set software preferences |
| **Week 13** | **Maintain CAD Gloves Software data**  | Day 1 | Save and open file in CAD Gloves DGS software | * **Task 14**

**Import file in DGS and save it.** |
| Day 2 | Export CAD Gloves DGS software file |
| Day 3 | Import files in CAD Gloves DGS software |
| Day 4 | Perform file restoration in CAD Gloves DGS software |
| Day 5 | Convert DGS file to GMS file |
| **Week 14** | **Prepare Pattern Surface for Scanning** | Day 1 | Clean Pattern Edges | * **Task 15**

**Prepare the surface of the given pattern for scanning.** |
| Day 2 | Smooth Pattern Notches |
| Day 3 | Repair Damag2222ed Pattern |
| Day 4 | Align Pattern of Gloves |
| Day 5 | Check Component of Gloves * Components of Gloves
 |
| **Week 15** | **Trace Pattern on CAD Gloves Software**  | Day 1 | Trace Front Pattern on DGS  | * **Task 16**

**Trace front and back pattern on CAD gloves DGS software** |
| Day 2 | Add Notches of Front Pattern on DGS |
| Day 3 | Trace Inner Design of Front Pattern on DGS |
| Day 4 | Trace Back Pattern on DGS  |
| Day 5 | Add Notches of Back Pattern on DGS |
| **Week 16** | **Trace Pattern on CAD Gloves Software**  | Day 1 | Trace Inner Design of Back Pattern on CAD Gloves DGS software | * **Task 17**

**Trace fourchette and thumb pattern on DGS software.** |
| Day 2 | Trace Fourchette Pattern on CAD Gloves DGS software |
| Day 3 | Add Notches of Fourchette pattern on CAD Gloves DGS software |
| Day 4 | Trace Thumb Pattern on CAD Gloves DGS software |
| Day 5 | Add Notches of Thumb Pattern on CAD Gloves DGS software |
| **Week 17** | **Upgrade Preparation File** | Day 1 | Verify Base Size | * **Task 18**

**Check pattern size and amend.**  |
| Day 2 | Add Size to Size Chart |
| Day 3 | Amend Pattern |
| Day 4 | Customize Size Chart as per technical data sheet* Technical data sheet of sizes
 |
| Day 5 | Align pattern according to sizing |
| **Week 18** | **Perform Grading of Working Gloves** | Day 1 | Perform Grading for Front of working Gloves on CAD Gloves DGS software | * **Task 19**

**Perform grading of working gloves.** |
| Day 2 | Perform Grading for Back of working Gloves on CAD Gloves DGS software |
| Day 3 | Perform Grading for Fourchette of working Gloves on CAD Gloves DGS software |
| Day 4 | Perform Grading for Thumb of working Gloves on CAD Gloves DGS software |
| Day 5 | Perform Grading for Cuff of working Gloves on CAD Gloves DGS software |
| **Week 19** | **Perform Grading of Dress Gloves** | Day 1 | Perform Grading for Front of dress Gloves on CAD Gloves DGS software | * **Task 20**

**Perform grading of dress gloves** |
| Day 2 | Perform Grading for Back of dress Gloves on CAD Gloves DGS software |
| Day 3 | Perform Grading for Fourchette of dress Gloves on CAD Gloves DGS software |
| Day 4 | Perform Grading for Thumb of dress Gloves on CAD Gloves DGS software |
| Day 5 | Perform Grading for Cuff of dress Gloves on CAD Gloves DGS software |
| **Week 20** | **Perform Grading of Mechanical Gloves** | Day 1 | Perform Grading for Front of mechanical Gloves on CAD Gloves DGS software | * **Task 21**

**Perform grading of mechanical gloves** |
| Day 2 | Perform Grading for Back of mechanical Gloves on CAD Gloves DGS software |
| Day 3 | Perform Grading for Fourchette of mechanical Gloves on CAD Gloves DGS software |
| Day 4 | Perform Grading for Thumb of mechanical Gloves on CAD Gloves DGS software |
| Day 5 | Perform Grading for Cuff of mechanical Gloves on CAD Gloves DGS software |
| **Week 21** | **Perform Grading of Fashion Gloves** | Day 1 | Perform Grading for Front of Fashion Gloves on CAD Gloves DGS software | * **Task 22**

**Perform grading of fashion gloves** |
| Day 2 | Perform Grading for Back of Fashion Gloves on CAD Gloves DGS software |
| Day 3 | Perform Grading for Fourchette of Fashion Gloves on CAD Gloves DGS software |
| Day 4 | Perform Grading for Thumb of Fashion Gloves on CAD Gloves DGS software |
| Day 5 | Perform Grading for Cuff of Fashion Gloves on CAD Gloves DGS software |
| **Week 22** | **Perform Adjustment in CAD Gloves GMS** | Day 1 | Import file in CAD Gloves GMS software | * **Task 23**

**Perform adjustment in CAD software** |
| Day 2 | Write fabric/material dimension and details in GMS* Order details
* Order name
* Fabric/material dimension format
 |
| Day 3 | Adjust Required Sizes |
| Day 4 | Add Fabric according to specifications of article |
| Day 5 | Set Fabric/material Shrinkage |
| **Week 23** | **Perform Nesting and Cutting in Flatbed cutter** | Day 1 | Place Components for Nesting | * **Task 24**

**Perform nesting and cutting of components of gloves in flatbed cutter** |
| Day 2 | Calculate Average for Consumption |
| Day 3 | Cut material for plotter |
| Day 4 | Make plotter file |
| Day 5 | Finalize and cut pattern as per requirement |
| **Week 24** | **Final Project Assessment** | Day 1 | Revision of work | * **Task 25**

**Prepare and submit complete pattern CAD files of welding and fashion Gloves** |
| Day 2 | Collect pattern and fabric for project |
| Day 3 | Prepare computer for pattern designing |
| Day 4 | Prepare Complete CAD file for welding |
| Day 5 | Prepare Complete CAD file for fashion Gloves |

# *Annexure-I:*

**Practical Tasks**

| **Task No.** | **Task** | **Description** | **Week** |
| --- | --- | --- | --- |
|  | Coordinate with the assistant and report their progress to supervisor | This is a group roleplay-based task where candidate gets progress update from another candidate acting as assistant and report it to the third candidate acting as supervisor. This will check its coordination and reporting skills | **Week 1** |
|  | Perform basic first aid for minor injury. | A simulated environment task where a pseudo blade cut injury on hand is presented and the candidate must perform first aid on the injury. | **Week 2** |
|  | Take measurement of sample provided. | A sample of gloves is provided, and the candidate must take measurements of that sample.  | **Week 3** |
|  | Draw geometrical shapes on cardboard. | The required geometrical shape will be given by the instructor. | **Week 4** |
|  | Draw straight lines on cardboard. | The lines are drawn on cardboard sheet. | **Week 4** |
|  | Prepare sketch for the front base of the required gloves. | Anyone of the following glove types is given to the candidate:* 707 Gloves
* Dress Gloves
* Hockey Gloves
* Cycle Gloves
* Fashion
 | **Week 5** |
|  | Prepare sketch for the back base of required gloves. | Anyone of the following glove types is given to the candidate:* 707 Gloves
* Dress Gloves
* Hockey Gloves
* Cycle Gloves
* Fashion Gloves
 | **Week 6** |
|  | Prepare sketch for fourchette of required gloves. | Anyone of the following glove types is given to the candidate:* 707 Gloves
* Dress Gloves
* Hockey Gloves
* Cycle Gloves
* Fashion Gloves
 | **Week 7** |
|  | Prepare sketch for thumb and cuff of required gloves. | Anyone of the following glove types is given to the candidate:* 707 Gloves
* Dress Gloves
* Hockey Gloves
* Cycle Gloves
* Fashion Gloves
 | **Week 8** |
|  | Prepare sketch for lining of required gloves | Anyone of the following glove patternis given to the candidate:* Front Base
* Back Base
* Fourchette
* Thumb
* Trank
 | **Week 9** |
|  | Turn on the computer and install Richpeace or any other CAD software. | Software installation procedures are the same for all software. One Glove CAD software installation procedure is enough. | **Week 10** |
|  | Attach scanner to CAD gloves software. | Scanner is provided | **Week 11** |
|  | Set preference of gloves CAD software. | Set preference of software as per personal use | **Week 12** |
|  | Import file in DGS and save it. | Import files are provided. | **Week 13** |
|  | Prepare the surface of the given pattern for scanning. | Surface cleaning of pattern is crucial for scanning | **Week 14** |
|  | Trace front and back pattern on CAD gloves DGS software. | Front and back patterns are provided  | **Week 15** |
|  | Trace fourchette and thumb pattern on DGS software. | Fourchette and thumb patterns are provided | **Week 16** |
|  | Check pattern size and amend. | Verification of base size is important  | **Week 17** |
|  | Perform grading of working gloves. | All five following components of gloves are required for grading* Front Base
* Back Base
* Fourchette
* Thumb
* Cuff
 | **Week 18** |
|  | Perform grading of dress gloves | All five following components of gloves are required for grading* Front Base
* Back Base
* Fourchette
* Thumb
* Cuff
 | **Week 19** |
|  | Perform grading of mechanical gloves | All five following components of gloves are required for grading* Front Base
* Back Base
* Fourchette
* Thumb
* Cuff
 | **Week 20** |
|  | Perform grading of fashion Gloves | All five following components of gloves are required for grading* Front Base
* Back Base
* Fourchette
* Thumb
* Cuff
 | **Week 21** |
|  | Perform adjustment in CAD software | Add order details and material dimensions | **Week 22** |
|  | Perform nesting and cutting of components of gloves in flatbed cutter | Calculate average consumption and material to cut for plotter | **Week 23** |
|  | Prepare and submit complete pattern CAD files of welding and fashion Gloves | Prepare complete pattern CAD files and submit it. | **Week 24** |

**Annexure-II:**

# Motivational Lectures

**Annexure-III:**

 **Workplace/Institute Ethics Guide**

Work ethic is a standard of conduct and values for job performance. The modern definition of what constitutes good work ethics often varies.  Different businesses have different expectations. Work ethic is a belief that hard work and diligence have a moral benefit and an inherent ability, virtue, or value to strengthen character and individual abilities. It is a set of values-centered on the importance of work and manifested by determination or desire to work hard.

The following ten work ethics are defined as essential for student success:

1. **Attendance:**Be at work every day possible, plan your absences don’t abuse leave time. Be punctual every day.
2. **Character:**Honesty is the single most important factor having a direct bearing on the final success of an individual, corporation, or product. Complete assigned tasks correctly and promptly. Look to improve your skills.
3. **Team Work:**

The ability to get along with others including those you don’t necessarily like. The ability to carry your weight and help others who are struggling. Recognize when to speak up with an idea and when to compromise by blend ideas together.

1. **Appearance:**Dress for success set your best foot forward, personal hygiene, good manner, remember that the first impression of who you are can last a lifetime
2. **Attitude:**Listen to suggestions and be positive, accept responsibility. If you make a mistake, admit it. Values workplace safety rules and precautions for personal and co-worker safety. Avoids unnecessary risks. Willing to learn new processes, systems, and procedures in light of changing responsibilities.
3. **Productivity:**Do the work correctly, quality and timelines are prized. Get along with fellows, cooperation is the key to productivity. Help out whenever asked, do extra without being asked. Take pride in your work, do things the best you know. Eagerly focuses energy on accomplishing tasks, also referred to as demonstrating ownership. Takes pride in work.
4. **Organizational Skills:**

Make an effort to improve, learn ways to better yourself. Time management; utilize time and resources to get the most out of both. Take an appropriate approach to social interactions at work. Maintains focus on work responsibilities.

1. **Communication:**Written communication, being able to correctly write reports and memos.
Verbal communications,being able to communicate one on one or to a group.
2. **Cooperation:**Follow institute rules and regulations, learn and follow expectations. Get along with fellows, cooperation is the key to productivity. Able to welcome and adapt to changing work situations and the application of new or different skills.
3. **Hard Work:**Work hard, work to the best of your ability. Carry out orders, do what’s asked the first time. Show respect, accept, and acknowledge an individual’s talents and knowledge. Respects diversity in the workplace, including showing due respect for different perspectives, opinions, and suggestions.

**Annexure-IV:**

**List of Tools, Equipment’s & Consumable with Quantity**

 **List of Tools and Equipment**

|  |  |  |
| --- | --- | --- |
| **Sr.****No.** | **Name of Item/ Equipment / Tools** | **Qty.** |
| 1. | Measuring Tape | 05 |
| 2. | Ruler 1 Inch | 05 |
| 3. | Geometry Box | 05 |
| 4. | Square Set | 05 |
| 5. | Curve Set | 05 |
| 6. | Teacher Table | 01 |
| 7. | Teacher Chair | 01 |
| 8. | Over Head Projector | 01 |
| 9. | White Board | 01 |
| 10. | Set scale | 05 |
| 11. | Scissor | 05 |
| 12. | Knife Cutter | 05 |
| 13. | Hole Puncher | 05 |
| 14. | Stapler | 01 |
| 15. | Cutting Mat | 02 |
| 16. | Computer with accessories | 15 |
| 17. | Scanner (A3 size) | 01 |
| 18. | Flatbed /Plotter /Cutter | 01  |

 **List of Consumables**

|  |  |  |
| --- | --- | --- |
| **Sr.****No**. | **Name of Consumable Supplies** | **Qty.** |
| 1. | Box Board Sheets |  100 |
| 2. | Paper Rim (A4) | 01 |
| 3. | Paper Tape 1” / Scotch Tape | 2 Pack |
| 4. | Led Pencil | 4 Pack |
| 5. | Grading Pointer | As per requirement |
| 6. | Black Pointer | As per requirement |
| 7. | Board Marker | 01 |
| 11. | CAD Gloves software (Richpeace recommended, Any other Gloves CAD) | As per requirement |