

GOVERNMENT OF THE PUNJAB

**TECHNICAL EDUCATION & VOCATIONAL
TRAINING AUTHORITY**



**CURRICULUM FOR
CUTLERY MANUFACTURING TECHNIQUES**

(3 – Months Course)
(July 2024)

**CURRICULUM SECTION
ACADEMICS WING**

96-H, GULBERG-II, LAHORE

Ph # 042-99263055-9, 99263064

gm.acad@tevta.gop.pk, manager.cur@tevta.gop.pk

TRAINING OBJECTIVES

This curriculum is designed specifically for cutlery industry to impart skills along with necessarily required theoretical knowledge to the students keeping in view their entrants' level and as per need of Cutlery industry in order to fill the gap of skilled work force. New and enhanced methods are introduced by more focusing on Cutlery items manufacturing techniques, by ensuring specific condition and working environment, proper safety precautions and cleanliness.

CURRICULUM SALIENT

Name of the Course	:	Cutlery Manufacturing Techniques
Entry level	:	Middle preferably Matric
Duration of course	:	3-Months.
Total training hours	:	400 Contact hours
Training Methodology	:	Practical 80%
		Theory 20%
Medium of Instruction	:	Urdu / English

SKILL COMPETENCY DETAILS

After completing this course, participants will develop the following skill competencies:

1. Proficient knowledge of foundational essentials in cutlery manufacturing.
2. Skill in utilizing hand tools and measuring instruments for precision work.
3. Expertise in selecting materials and applying polishing compounds for desired finishes.
4. Advanced understanding and application of forming techniques for diverse cutlery designs.
5. Specialization in advanced techniques tailored to specific cutlery types and styles.
6. Proficiency in executing finishing processes to enhance product aesthetics and functionality.
7. Quality control expertise ensuring product excellence and mastery in adding finishing touches.
8. Competency in branding and packaging strategies for marketing cutlery products effectively.

KNOWLEDGE PROFICIENCY DETAILS

Upon completion of this course, trainees will acquire the following knowledge proficiency:

1. In-depth knowledge of various hand tools and measuring instruments used in cutlery production.
2. Advanced comprehension of materials selection and the science behind polishing compounds for different finishes.
4. Expertise in diverse forming techniques employed in shaping cutlery products.
5. Specialized knowledge in advanced techniques tailored to specific types of cutlery.
6. Detailed understanding of finishing processes and their impact on product aesthetics and functionality.
7. Thorough knowledge of quality control measures and techniques for ensuring product excellence.
8. Understanding of branding strategies and packaging concepts relevant to the cutlery industry.

SCHEME OF STUDIES
Cutlery Manufacturing Techniques
(3–Months Course)

S.No	Main Topics	Theory Hours	Practical Hours	Total Hours
1.	Comply Health & Safety guidelines	10	4	14
2.	Introduction to Hand tools and Measuring tools	7	14	21
3.	Material Selection & Polishing Compounds	8	16	24
4.	Forming Techniques	14	73	87
5.	Specialization Techniques	14	70	84
6.	Finishing Process	10	60	70
7.	Quality Control & Finishing Touches	10	63	73
8.	Branding & Packaging	7	20	27
Total		80	320	400

DETAIL OF COURSE CONTENTS
Cutlery Manufacturing Techniques
(3 – Months Course)

Sr.No	Detail of Topics	Theory Hours	Practical Hours
1.	Comply Health & Safety guidelines 1.1 Identification of hazards at workplace 1.2 Use of Personal Protective and safety equipment (PPEs) 1.3 Safe handling of tools, machines, equipment and materials.	10	4
2	Introduction to Hand Tools & Measuring Tools 2.1 Measuring Tools 2.1.1 Steel Foot Rule / Measuring Tape 2.1.2 Caliper Inside / Outside 2.1.3 Vernier Caliper, Kinds and Use 2.2 Hammer 2.2.1 Straight Peen Hammer 2.2.2 Cross Peen Hammer 2.3 Combination Pliers 2.3.1 Round Nose Pliers 2.3.2 Long Nose Plier 2.4 Drill Bits 2.5 Thread Taps & Dies 2.6 Screw Driver Sets 2.7 Files	7	14

	2.8 Punches 2.8.1 Pin Punch 2.8.2 Centre Punch 2.8.3 Prick Punch 2.8.4 Hallow Punch 2.8.5 Hand punch		
3	Material Selection & Polishing Compounds 3.1 Material Selection Criteria 3.1.1 Food Contact 3.1.2 Durability 3.1.3 Formability 3.1.4 Finish 3.2 Polishing Compound Selection 3.2.1 Cutting Compounds 3.2.2 Intermediate Compounds 3.2.3 Finishing Compounds	8	16
4	Forming Techniques 4.1 Shearing Techniques 4.1.1 Function 4.1.2 Equipment 4.1.3 Variation in Shearing 4.1.3.1 Straight Shearing 4.1.3.2 Angle Shearing 4.1.4 Sheet Thickness 4.2 Blanking Techniques 4.2.1 Stamping with Single Die 4.2.2 Compound Dies (Progression Dies)	14	73

	4.2.3 Fine Blanking 4.2.4 Pre Punching 4.2.5 Main Punching 4.2.6 Material Properties 4.2.7 Nesting 4.2.8 Lubrication 4.3 Deburring Techniques 4.3.1 Tumbling 4.3.2 Vibratory Deburring 4.3.3 Centrifugal Deburring 4.3.4 Drag Finishing 4.3.5 Hand Finishing 4.3.6 Choosing the Right Technique 4.3.6.1 Number of Parts 4.3.6.2 Complexity of the Cutlery 4.3.6.3 Desired Finish 4.3.6.4 Cost & Production Time 4.4 Rolling Techniques 4.4.1 Cold Rolling 4.4.2 Hot Rolling 4.4.3 Rolling Techniques for Specific Cutlery Parts 4.4.3.1 Spoon Bowls 4.4.3.2 Knife Blades 4.4.3.3 Fork Tines 4.4.4 Additional Consideration 4.4.4.1 Number of Passes 4.4.4.2 Lubrication 4.4.4.3 Annealing		
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	4.5 Trimming 4.5.1 Stamp Trimming 4.5.2 Fine Blanking Trimming 4.5.3 Laser Trimming 4.5.4 Waterjet Trimming 4.5.5 Choosing the Right Trimming Techniques 4.5.5.1 Production Volume 4.5.5.2 Complexity of the Shape 4.5.5.3 Material Thickness 4.5.5.4 Cost & Production Time 4.6 Coining & Stamping Techniques 4.6.1 Coining Process 4.6.1.1 Coining Press 4.6.1.2 Dedicated Dies 4.6.1.3 High Pressure 4.6.2 Benefits of Coining 4.6.2.1 Improved Details 4.6.2.2 Enhanced Appearance 4.6.2.3 Increase Strength 4.6.3 Applications of Coining 4.6.3.1 Refining Spoon Bowl Shape 4.6.3.2 Sharpening Fork Tines 4.6.3.3 Enhancing Knife Edges 4.6.3.4 Creating Decorative Elements 4.6.4 Limitations of Coining 4.6.4.1 Limited Functionality 4.6.4.2 Material Consideration 4.6.2.3 Die Design 4.7 Spoon & Fork Bending 4.7.1 Punch/Eccentric Press		
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	4.7.2 Draw Forming 4.7.3 Roll Forming 4.7.4 Hydroforming 4.8 Proper disposal of wastage material.		
5	Specialization Techniques 5.1 Fork Tines/Prongs 5.1.1 Piercing 5.1.2 Trimming 5.1.3 Progressive Dies 5.1.4 Coining 5.1.5 Fine Blanking 5.2 Knife Serration 5.2.1 Introduction to Knife Serration 5.2.2 Basic Concepts of Serration 5.2.3 Serration Manufacturing Process 5.2.3.1 Grinding Techniques 5.2.3.2 Milling Process 5.2.3.3 Heat Treatment 5.2.4 Quality Control & Testing 5.2.5 Advanced Techniques & Innovations 5.3 Proper disposal of wastage material.	14	70
6	Finishing Process 6.1 Grinding & Polishing 6.1.1 Manual Techniques 6.1.1.1 Abrasive Belts 6.1.1.2 Polishing Wheels 6.1.2 Mechanical Techniques 6.1.2.1 Belt Grinding 6.1.2.2 Polishing Machines	10	60

	6.1.2.3 Polishing Robots 6.1.3 Vibratory Techniques 6.1.3.1 Vibratory Tumbling 6.1.3.2 Vibratory Polishing 6.2 Choosing the Right Techniques for Polishing 6.2.1 Production Volume 6.2.2 Desired Finish 6.2.3 Complexity of the Cutlery Shape 6.2.4 Cost 6.3 Buffing Techniques for Cutlery Items 6.3.1 Manual Techniques 6.3.1.1 Buffing Wheels 6.3.1.2 Sisal Wheels 6.3.1.3 Muslin Wheels 6.3.1.4 Buffing Sticks 6.3.2 Mechanical Techniques 6.3.2.1 Automatic Buffing Machines 6.3.2.2 Programmable Settings 6.3.2.3 Buffing Robots 6.3.2.4 Precise Control 6.3.3 Vibratory Techniques 6.3.3.1 Satin or Matte Finish 6.3.3.2 Vibratory Polishing 6.4 Choosing the Right Techniques for Buffing 6.4.1 Production Volume 6.4.2 Desired Finish 6.4.3 Complexity of the Cutlery Shape 6.4.4 Cost		
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	6.5 Proper disposal of wastage material.		
7	Quality Control & Finishing Touches 7.1 Cleaning or Washing Techniques 7.1.1 Pre and In-Process Cleaning 7.1.1.1 Solvent Cleaning 7.1.1.2 Emulsion Cleaning 7.1.1.3 Ultrasonic Cleaning 7.1.2 Post Production Cleaning 7.1.2.1 Electrolytic Cleaning 7.1.2.2 Vibratory Finishing with Cleaning Media 7.2 Additional Consideration 7.2.1 Wastewater Treatment 7.2.2 Rinsing 7.2.3 Drying	10	63
8	Branding & Packaging 8.1 Stamping 8.1.1 Punch Stamping 8.1.2 Etching 8.1.3 Laser Marking 8.2 Packing 8.2.1 Wrapping with Butter Paper 8.2.2 Boxing 8.2.3 Blister Packing 8.2.4 Vacuum Packing 8.2.5 Customized Packing	7	20
		80	320

LIST OF PRACTICAL

1	Demonstrating proper usage of hammers, files, chisels, pliers, vises, and anvils for shaping and forming metal.
2	Using calipers, micrometers, rulers, Vernier calipers, and to accurately measure dimensions and tolerances of cutlery components.
3	Preparing materials through cutting, shaping, and surface preparation techniques.
4	Practicing various forming techniques such as forging, stamping, and pressing to shape metal into desired cutlery designs.
5	Applying polishing compounds and utilizing buffing wheels to achieve different surface finishes (e.g., satin, matte, mirror).
6	Experimenting with different polishing techniques to enhance aesthetic appeal and surface smoothness.
7	Perform coining and stamping to add decorative elements or intricate designs to cutlery pieces.
8	Performing heat treatment processes such as annealing, quenching, and tempering to optimize the hardness and toughness of cutlery materials.
9	Designing and creating packaging solutions for finished cutlery products, including heat sealing, labeling, and arranging protective packaging materials.
10	Applying learned techniques and skills to complete individual or group projects, demonstrating proficiency in cutlery manufacturing from start to finish.

LIST OF TOOLS / MACHINERY / EQUIPMENT ETC

(For a Class of 25 Students)

Name of Trade	Cutlery Manufacturing Techniques
Duration of Course	3 Months

S. No	Names of Equipment / Tools / Items	Quantity
1.	Steel rule 30 cm	25 Nos.
2.	Steel Tape 3 meter	15 Nos.
3.	Vernier Caliper	15 Nos
4.	Work benches	10 Nos.
5.	Bench vice 5"	15 Nos.
6.	Straight Peen Hammer 250 grams and 500 grams	05 Nos Each
7.	Jamboor	10 Nos.
8.	Outside Caliper 6"/15 Cm	15 Nos.
9.	Thickness Gauges	10 Nos.
10.	Tri square 8"	15 Nos.
11.	Combination Pliers 8"	10 Nos.
12.	Open end spanner set in Inch. (double end ¼ to 1")	03 No.
13.	Open end spanner set in mm (double end 6mm to 32mm)	03 No.
14.	Screw driver straight 8" & 12"	10 Nos. each
15.	Screw driver Philips 8" & 12"	10 Nos. each
16.	Hand shear straight 12"	10 Nos.
17.	Centre punch	10 Nos.

18.	Hand vice	10 Nos.
19.	Tap and die set (6-12 mm)	03 Nos.
20.	Line scribe	25 Nos.
21.	Pedestal drill machine	02 No.
22.	Pedestal grinder wheel size 300 x 50mm	03 No.
23.	Hand disc grinder 4"	02 Nos.
24.	Hand vice	05 Nos.
25.	Hydraulic Press 25 tons	01
26.	Friction Spindle Press 50 tons	01
27.	Rolling Machine	01
28.	Shear Machine 6ft	01
29.	Bench Grinders	04
30.	Grinding/Polishing Machines (Pedestal)	03
31.	Marking machine (Laser)	01
32.	Vibratory Tumblers	02
33.	Ultrasonic Cleaners	01
34.	Heat Sealers	01

LIST OF LABS/WORKSHOPS

- **Press Workshop**
- **Polishing Workshop**
- **Packaging Workshop**

Note: Single hall with temporary partition can be used for Packaging and Press work.

LIST OF CONSUMABLES**(For a class of 25 students)**

Sr. No.	Item	Quantity
1	Disposable Gloves	50 Nos
2	Safety Goggles	25 Nos
3	Apron	25 Nos
4	Stainless Steel Sheets	As required
5	Polishing Compounds	100 bars
6	Abrasive Belts	100 Nos
7	Grinding Wheels	10 Nos
8	Sand papers	30 Rolls
9	Matt and Mirror finishing wheels	05 Nos Each
10	Cardboard Boxes	As required
11	Foam Inserts	As required
12	Bubble Wraps	As required
13	Labels	As required
14	Packaging Tape	As required
15	Polishing Cotton buffs	10 Nos

MINIMUM QUALIFICATION OF INSTRUCTOR

- B.Sc Engineering Technology or B.Tech (Hons) in Mechanical with one year experience, preferably in the relevant field

OR

- D.A.E Mechanical with two year experience preferably in the relevant field.

MINIMUM QUALIFICATION OF LAB TECHNICIAN

- 05 years cutlery manufacturing industrial experience with matric qualification

OR

- 10 years cutlery manufacturing industrial experience

REFERENCE BOOKS

- W.R Case & Sons Cutlery Company by Shirley Boser
- Forks, Knives & Spoons by Peri Wolfman
- British Cutlery by Peter Brown
- Sheffield's Industries: Cutlery, Silver & Edge Tools by Joan Unwin
- The Case Cutlery Dynesty by Brad Lockwood

EMPLOYABILITY OF PASSOUTS

The pass outs of this course may find job / employment opportunities in the following areas / sectors: -

1. Cutlery Industry
2. Cutlery Vendor Workshop
3. Self-Employment

OCCUPATIONS & Job Designations in various Industries/ Market

- Workshop Assistant
- Press man
- Grinding and Polishing Expert
- Foreman

Curriculum Development Committee

1.	Mr. Hasan Raza Khan, Instructor, TEVTA CSTISC, Wazirabad	Convener
2.	Mr. Adnan Javaid, M/S PAK Handi Crafts, Pak Town, Allahabad, Nizamabad, Wazirabad.	Member
3.	Mr. Rahat Nazar, M/S Rahat Stainless Steel, Gali Saleem Market Wali, Arif Shaheed Road, Wazirabad.	Member