

Modular Course D. Customization Engineering

Unit D1: Customization in the Leather & Footwear Sector

Lecture D1.3 – Design of Customized Products



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T2.2 – Development of modular
courses and training
material.

D2.4 – Modular Course in
Customization Engineering



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Introduction

- ❖ Multidisciplinary nature of footwear design
- ❖ Shift from mass production to customization
- ❖ Role of CAD/CAM, 3D scanning, and rapid prototyping
- ❖ Benefits: comfort, aesthetic, sustainability, consumer-brand connection

Leather and Shoe Design

- ❖ Importance of biomechanics and foot dynamics
- ❖ Key considerations: last, insole, upper construction
- ❖ Impact of poor design on foot health
- ❖ Material selection: leather vs. fabric, stress distribution

Structural Components of Footwear

- ❖ Sole, midsole, insole, heel counter
- ❖ Support, cushioning, durability
- ❖ Special considerations: occupational and diabetic footwear

Craftsmanship and Modern Technologies

- ❖ Traditional craftsmanship:
hand shaping, detailing
- ❖ Modern tech: CAD/CAM,
robotic polishing,
automated stitching
- ❖ Hybrid approach: precision
+ ergonomic support

Anatomy of a Shoe

- ❖ Three primary elements: soles, uppers, heels
- ❖ Function vs. aesthetics
- ❖ Materials commonly used

Categories of Footwear

- ❖ Sneakers: comfort & versatility
- ❖ Boots: durability & protection
- ❖ Sandals: ventilation & style
- ❖ Heeled footwear: aesthetics & posture

Material Selection

- ❖ Leather, synthetic, canvas, rubber, mesh
- ❖ Sustainability and alternatives
- ❖ Impact on comfort, biomechanics, aesthetics

Tools and Methods

- ❖ Digital: Adobe Illustrator, Blender, Rhino
- ❖ Traditional: sketching, hand-rendering
- ❖ Prototyping: foam/clay, fit testing
- ❖ Customization: embroidery, engraving, finishes

Design of Customized Products (Framework & Philosophy)

- ❖ Modular Design
- ❖ Parametric Design
- ❖ Last Customization
- ❖ Digital Tools: 3D CAD, Rendering, 3D Printing
- ❖ Customization Parameters: Aesthetic,
Functional, Ergonomic

Why Good Leather & Shoe Design Matters

- ❖ Sketching & Concept Development
- ❖ Technical Drawings & Pattern Making
- ❖ Prototypes & Grading
- ❖ Cutting & Stitching
- ❖ Finishing Techniques & Accessories

Why Good Leather & Shoe Design Matters

- ❖ Adaptive design for dynamic foot morphology
- ❖ Material impacts biomechanics
- ❖ Cushioning & structure reduce injury risk
- ❖ Ergonomic footwear for special populations
- ❖ Craftsmanship + modern technology