



# FASHION DESIGN AND OPERATIONS 50.0407.00

## TECHNICAL STANDARDS

An Industry Technical Standards Validation Committee developed and validated these standards throughout December 2023 and January 2024. The Arizona Career and Technical Education Quality Commission, the validating authority for the Arizona Skills Standards Assessment System, endorsed these standards on January 24, 2024.

Note: Arizona's Professional Skills are taught as an integral part of the Fashion Design and Operations program.

**The Technical Skills Assessment for Fashion Design and Operations is available SY2025-2026.**

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### STANDARD 1.0 APPLY MATHEMATICAL CALCULATIONS TO PROJECTS IN DESIGN AND MERCHANDISING

- 1.1 Use mathematical processes in design and merchandising employing data to establish trends in the industry (e.g., include numeric, symbolic, and/or graphic representations)
- 1.2 Perform mathematical calculations in the context applying the rule of thumb principle in wholesale pricing (i.e., 30-50% profit margins, wholesale prices vs. retail prices, etc.)
- 1.3 Perform conversions of U.S. and Metric units of measurement
- 1.4 Calculate the cost of projects including total person hours per task and cost of materials
- 1.5 Calculate percentages in merchandising and manufacturing sales using mathematical formulas (e.g., markup/markdown, gross margin, keystoneing, and profit and loss)
- 1.6 Define mass production and its advantages (i.e., division of labor, cost effectiveness, large scale demand, higher profit, etc.) and disadvantages (i.e., capital intensive, errors produced in mass quantities that require costly redesign, repetitive work, etc.)
- 1.7 Explain the transition from prototype to mass production (i.e., trend/demand research, sketch/design software, raising capital, etc.)
- 1.8 Use a fabric weight classification chart to determine the correct fabric for a project (e.g., lightweight, medium weight, and heavyweight)

### STANDARD 2.0 EXAMINE MEASUREMENT TECHNIQUES IN PATTERN DESIGN, GARMENT MANUFACTURING, AND MERCHANDISING

- 2.1 Explain factors contributing to accurate body measurement for a well-fitted and enhanced look in clothing, minimizing fabric waste, and providing value to the wearer
- 2.2 Demonstrate Points of Measure (POM) from starting to ending location, including tolerance [i.e., the acceptable number of inches (plus or minus ½ inch) over specified quality standards], in gathering measurement data (i.e., body length at front, body length at back, chest width, waist width, etc.)
- 2.3 Recognize advanced technology integration for improved measurement accuracy [e.g., Computer-Aided Design (CAD) and 3D body scanning]
- 2.4 Use anthropometric data (e.g., measuring and analyzing the dimensions and proportions of the human body) to create patterns and garments that accommodate a wide range of body shapes and sizes
- 2.5 Describe the functions and types of traditional measurement and pattern drafting tools used in design, manufacturing, and merchandising (i.e., tape measure, rulers and yardsticks, flexible curve ruler, hem/seam gauge, French curve, hip curve, fabric scissors, etc.)
- 2.6 Select the appropriate measurement tool for a specific task in pattern drafting (i.e., French curve for necklines, armholes, and other curves in a garment, etc.)
- 2.7 Select the appropriate measurement technique and tools for a specific project requirement (e.g., pleating, seaming, and gathering)
- 2.8 Select the appropriate measurement technique and tools for a specific need considering fabric type, thickness, and intended use (e.g., apparel, industrial, and/or medical)
- 2.9 Discuss the advantages and disadvantages of digital cutting tables vs. traditional sewing tools

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## **STANDARD 3.0 ANALYZE THE PRINCIPLES AND ELEMENTS OF DESIGN**

- 3.1 Explain how basic design elements (e.g., line, shape, form, space, texture, and color) form structure and convey visual messages
- 3.2 Explain how basic design principles (e.g., contrast, balance, emphasis, proportion, hierarchy, repetition, rhythm, pattern, positive and negative space, movement, variety, and unity) are combined with design elements to create harmony
- 3.3 Identify terminology related to color theory as an element of science and art (e.g., color wheel; primary-, secondary-, and tertiary colors)
- 3.4 Differentiate among the three components of color (e.g., hue, saturation, and brightness)
- 3.5 Identify color scheme on the color wheel and how colors create visually appealing looks in garments, accessories, and fashion collections (e.g., complementary, analogous, warm and cool, and pastels)
- 3.6 Use the Pantone Color Matching System to identify colors, match colors, and provide color data when needed (i.e., included in a tech pack, line sheet, etc.)
- 3.7 Explain how the psychology of color can establish harmony, and draw out emotions in garments (i.e., red is strong and powerful; blue portrays calm and sadness; purple is an indication of wealth; etc.)

## **STANDARD 4.0 EVALUATE TEXTILES, FIBERS, AND FABRICS FOR THE OVERALL LOOK AND FUNCTIONALITY OF A GARMENT**

- 4.1 Differentiate among textiles, fibers, and fabrics
- 4.2 Identify the characteristics of natural and synthetic (manufactured) fibers
- 4.3 Differentiate among the names and characteristics of fabrics with various construction weaves [i.e., plain weave (most cottons, linen, rayon, chiffon, muslin, etc.); twill weave (denim, gabardine, velvet, etc.); and satin weave (crepe, charmeuse, damask, etc.)]
- 4.4 Differentiate among woven, knit, and other methods of fabric construction (e.g., how fabric looks, handles, and behaves)
- 4.5 Identify fabric finishes that improve the appearance, performance, or hand of the finished textile (i.e., washing and drying, heat setting, calendaring, dyeing, coating, etc.)
- 4.6 Identify healthy, wellness, and cosmetic textiles that promote the well-being of the wearer for comfort, health, or appearance (i.e., antimicrobial, moisture wicking, UV protective fabrics, compression garments, cosmetic infused fabrics, etc.)
- 4.7 Examine various fabric treatments applied to textiles to enhance their properties or provide specific functionalities (i.e., fireproofing, embossed treatment, shrink resistance treatment, wrinkle resistance treatment, starch treatment, etc.)
- 4.8 Consider modifications to color prior to color application [e.g., fiber's chemical structure, environment (i.e., sunlight, fumes, ozone, etc.), and laundering (i.e., colorfastness, bleeding, crocking, deodorants; etc.)]
- 4.9 Identify color application methods (i.e., solution dyeing, yarn dyeing, piece dyeing, fabric dyeing, garment dyeing, product dyeing, etc.)
- 4.10 Select fibers and fabrics for specific end uses (i.e., polyurethane fibers for lingerie and swimsuits, olefin fibers for sportswear and activewear, etc.)
- 4.11 Apply care and content labeling for fabrics to increase garment wear

## **STANDARD 5.0 ANALYZE THE CHARACTERISTICS, MOTIVATIONS, AND BEHAVIORS OF CONSUMERS IN A TARGET MARKET**

- 5.1 Distinguish quality customer service (i.e., responsive communication, empathy and understanding, problem resolution, being proactive, personal, and available, etc.) from poor customer service (i.e., ignorance, inadequate training, unresponsiveness, temporary fixes, high turnover, etc.)
- 5.2 Analyze the relationship between customer service and customer satisfaction in determining the overall success of a business (e.g., sustained success and growth and long-term benefits)
- 5.3 Explain the concept of a target customer as a marketing and business strategy for attracting and retaining customers (i.e., demographics, behavioral factors, market segmentation, product development, etc.)
- 5.4 Discuss how a target customer is a central factor in product selection and development based on the needs and preferences of the customer (i.e., product design and features, pricing, marketing, distribution, etc.)
- 5.5 Distinguish the relationship among pricing, profit, and the customer's perception of value as a strategic approach (i.e., balance between setting prices and profit, creating a positive customer perception of value, etc.)
- 5.6 Compare and contrast common selling techniques to influence customers and increase sales (e.g., suggestion selling, loss leader, upselling, cross-selling, and limited-time offers)

## **STANDARD 6.0 EXAMINE THE SALE OF GOODS AND SERVICES TO END CONSUMERS THROUGH BRICK-AND-MORTAR AND E-COMMERCE PLATFORMS**

- 6.1 Describe the tangible customer experience of touching, feeling, and trying on products through a brick-and-mortar platform

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- 6.2 Explain the advantages of personal interaction from in-store staff that enhances the overall shopping experience (i.e., personalized assistance, advice, styling tips, etc.)
- 6.3 Discuss the importance of Point of Sale (POS) efficiency in managing sales transactions and inventory effectively
- 6.4 Explain the disadvantages of limited space in a physical store
- 6.5 Discuss the importance of store location to attract foot traffic
- 6.6 Discuss logistics within a retail store for receiving, marking, stocking, and restocking inventory
- 6.7 Explain the 24/7 accessibility of an e-commerce platform (e.g., convenience of shopping anytime and anywhere)
- 6.8 Discuss the advantages and disadvantages of showcasing a wide variety of products, styles, sizes, and unlimited shelf space with online shopping (e.g., positive to the consumer but not always beneficial for the company)
- 6.9 Discuss augmented reality (AR) and virtual reality (VR) to allow customers to virtually try on clothing before purchasing
- 6.10 Discuss the challenges of e-commerce shopping (e.g., returning items and lack of physical interaction) and its impact on customer satisfaction
- 6.11 Compare and contrast brick-and-mortar and e-commerce platforms in the fashion industry [i.e., operational costs (e.g., rent, utilities, and staff salaries); customer service; inventory and variety; social media, etc.]
- 6.12 Examine the integration of brick-and-mortar and e-commerce platforms (e.g., order online and pick up and/or return items in-store, and marketing and branding through the same social media platforms)

## **STANDARD 7.0 EXAMINE MARKETING SKILLS FOR THE SUCCESS OF A DESIGN AND MERCHANDISING BUSINESS**

- 7.1 Describe how visual merchandising influences customer perception and behavior in the retail environment
- 7.2 Evaluate the concept of visual merchandising using the principles and elements of design to attract customers and encourage sales (i.e., color to stimulate emotion, line for drawing customer attention to specific products, emphasis for promotional item placement, etc.)
- 7.3 Describe effective uses of social media for fashion marketing to build brand awareness and drive sales [i.e., fashion shows and contests; interactive platforms (i.e., Instagram, Twitter, etc.); fashion tutorials and tips (i.e., YouTube, TikTok, Instagram Reels, etc.)]
- 7.4 Compare and contrast social media for fashion design (i.e., Pinterest, Behance, Dribbble, Reddit, etc.) and how current trends and audience demographics can rapidly change platform popularity
- 7.5 Describe the process of fashion forecasting and how it shapes the fashion outlook (e.g., anticipating trends and guiding the decisions of designers and industry professionals)
- 7.6 Discuss the 5 P's of Marketing (e.g., Product, Price, Promotion, Place, and People)
- 7.7 Explain types and uses of promotional activities to market products and services (i.e., advertising for brand awareness, sales promotions to boost sales and attract new customers, direct marketing for targeted communication, etc.)
- 7.8 Describe ethical behavior in marketing to include moral principles and standards in all aspects of the marketing process

## **STANDARD 8.0 DISTINGUISH AMONG DIVERSE INFLUENCES ON THE FASHION DESIGN INDUSTRY**

- 8.1 Discuss inventions and innovations that had a global impact in fashion, shaping the way people around the world approached clothing and personal style (e.g., cotton gin, sewing machine, the zipper, and paper patterns)
- 8.2 Describe key moments in the 20th century defined by various social, cultural, and political events that influenced the development of American fashion (i.e., World War I, The Roaring Twenties, The Great Depression, Hippie Movement, etc.)
- 8.3 Explain changes during the 20th century that greatly influenced the development of American fashion [i.e., technological (i.e., mass production techniques, development of synthetic fabrics, etc.); advancements in textile printing techniques (i.e., direct-to-garment, direct-to-fabric, flatbed, etc.); social (i.e., women's liberation, youth culture, globalization, etc.); and cultural (i.e., Golden Age of Hollywood, music and subcultures, casualization of fashion, etc.)]
- 8.4 Identify psychological influences on the development of fashion trends (i.e., social identity and conformity; self-expression and individuality; media and celebrity influence; etc.)
- 8.5 Explain how values are communicated through clothing and accessories as a form of nonverbal communication (i.e., personal, cultural, and ethnic identity, socioeconomic status, gender identity, etc.)
- 8.6 Describe the role of leading designers, celebrities, and other influencers in determining fashion trends (i.e., trends on the runway, celebrity endorsement and red-carpet influence, social media, cultural and social movements, etc.)
- 8.7 Discuss the growing awareness of environmental issues focusing on sustainable and eco-friendly fashion as a business approach (e.g., sustainable materials and ethical production practices)

## **STANDARD 9.0 ANALYZE A FASHION DESIGN AND MERCHANDISING BUSINESS**

- 9.1 Describe employment opportunities in the apparel industry from design and production to retail and marketing
- 9.2 Analyze emerging employment opportunities with an emphasis on sustainability and technology (e.g., eco-friendly fashion and digital solutions)

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- 9.3 Compare and contrast the advantages and disadvantages of sole proprietorships, partnerships, and corporations
- 9.4 Identify the stages of apparel production that contribute to the creation of a finished garment (i.e., design sketches and fabrics, pattern templates, prototypes, sewing and assembly, quality control, etc.)
- 9.5 Differentiate fashion design lines (e.g., the creative and thematic characteristic of a brand) and price points (e.g., the financial piece)
- 9.6 Categorize clothing based on craftsmanship, exclusivity, and the target market
- 9.7 Discuss how design decisions can affect the cost of apparel (e.g., haute couture, designer, bridge, contemporary, moderate, and budget/mass market)
- 9.8 Explain the importance of sourcing as it relates to the design process (e.g., access to materials, components, and resources) necessary to bring creative visions to life (i.e., material selection, cost efficiency, availability of ethical and sustainable sources, etc.)
- 9.9 Describe the steps in the manufacturing process influenced by sustainability (i.e., labeling and packaging, distribution and retail, etc.)
- 9.10 Identify components of trade relations that contribute to the production, distribution, and consumption of fashion products [i.e., global trade agreements and governmental policies; taxes, tariffs, and duties; Intellectual Property Protection (IPP), etc.]
- 9.11 Identify channels for product distribution (i.e., retailer websites, retailer applications, brick-and-mortar, catalogs, social media, etc.)

## **STANDARD 10.0 ANALYZE FACTORS THAT DETERMINE THE SELECTION OF CLOTHING**

- 10.1 Describe how people use clothing to reflect personal taste and comfort, cultural norms and traditions, societal influence and fashion trends, and functionality (i.e., sports, work, social events, etc.)
- 10.2 Describe how people choose clothing for practicality (i.e., formal vs. casual; warm vs. cold climate; budget/financial considerations, etc.)
- 10.3 Identify body types and characteristics that influence the proper selection of clothing for comfort and confidence (e.g., anthropometrics and physical attributes)
- 10.4 Recognize commonly used print to create visually appealing patterns on fabrics (i.e., stripe, dot, directional, plaid, houndstooth, engineered print, graphic/location print, etc.)
- 10.5 Describe how an illusion of size can be created by the proper selection of fabric design (i.e., large vs. small prints; vertical stripes and patterns; horizontal lines, etc.)
- 10.6 Describe how an illusion of size can be created by the proper selection of fabric texture (i.e., matte vs. shiny fabric; fabric weight and drape; color and contrast, etc.)

## **STANDARD 11.0 CONSTRUCT A GARMENT BY PRECISELY APPLYING THE PRINCIPLES OF QUALITY APPAREL CONSTRUCTION**

- 11.1 Design and plan the creation of a garment (e.g., fabric choice, garment function, and target audience)
- 11.2 Determine yardage, cost of fabric, and other needs (i.e., durability, comfort, care instructions, etc.) appropriate for the garment's purpose
- 11.3 Compare the quality of different clothing construction techniques and their financial result (e.g., serged seam vs. wide margin seam)
- 11.4 Define terms commonly used in pattern directions and layout (e.g., straight grain, cross grain, bias, selvage, center front, nap, and print matching)
- 11.5 Interpret and follow pattern directions for constructing apparel including marker-making language [e.g., symbols and notations used (i.e., notches, cutting lines, fold lines, seam allowance, etc.)] to communicate pattern layout and cutting instructions on a marker
- 11.6 Perform pattern layout and cutting for garment construction to minimize waste/cost
- 11.7 Explain the use of appropriate equipment to practice quality stitching (e.g., sewing machine with various presser feet and stitching options and serger/overlock machine) and effective pressing techniques (e.g., iron and ironing board for steaming, starching, and pressing throughout project)
- 11.8 Evaluate the construction and proper fit of garments (i.e., proportion and silhouette, ease and comfort, consistency across sizes, etc.)
- 11.9 Focus on details and finishing techniques to contribute to the overall quality of a project (e.g., pockets, trims, buttons, lining, and hand-sewn hems)

## **STANDARD 12.0 PREPARE FASHION DESIGNS**

- 12.1 Identify various garment styles (i.e., neckline, sleeves, silhouette, hemline, etc.); parts (i.e., bodice, skirt/pants, waistband, cuffs, etc.); and details (i.e., seams, darts, pleats, buttons/fastenings, pockets, embellishments, etc.) that make up a specific garment

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- 12.2 Describe an 8 head croquis and its proportion and accuracy for creating realistic and lifelike figure drawings (e.g., head-to-body ratio, torso, body divisions, shoulder width, arm and leg length, etc.)
- 12.3 Use the proportions of an 8 head croquis to sketch a design
- 12.4 Use the elongated and exaggerated proportions of a 9 head croquis for fashion illustration and dramatic scale
- 12.5 Recognize inclusivity and accessibility in adaptive clothing design for people with physical attributes and disabilities (i.e., magnetic closures, Velcro fastenings, larger buttons, accommodations for unique body shapes and proportions, etc.)
- 12.6 Describe how the principles and elements of design are used to effectively create harmony (e.g., pleasing visual unity)
- 12.7 Select appropriate fabrics for a fashion design to create visual appeal, garment comfort, drape, and functionality
- 12.8 Identify design features and construction details on a technical flat to communicate a project plan (i.e., neckline, shoulder and armhole, sleeve style, darts and seams, pockets, etc.)
- 12.9 Identify computer software and applications for Computer-Assisted Design (CAD) in the fashion industry (e.g., Auto CAD, Photoshop, and Illustrator); 3D fashion design software (i.e., CLO 3D, Browzwear, Seddi Textura); and Pattern-Making Software (i.e., Optitex, Lectra, Gerber AccuMark, Tukatech, etc.)
- 12.10 Select components of an apparel line (i.e., market research, concept and theme, design, fabric sourcing, production planning, branding, etc.)

### **STANDARD 13.0 EXPLAIN THE IMPORTANCE OF ACCESSORIES IN FASHION TO ENHANCE AND DEFINE INDIVIDUAL STYLE**

- 13.1 Identify accessories as a way to express personality, style, and creativity
- 13.2 Categorize accessories that add a finishing touch to an outfit (i.e., bags, shoes, jewelry, belts, scarves, eyewear, hair accessories, etc.)
- 13.3 Identify accessory styles within various categories (i.e., shoes: pumps, sneakers, boots, sandals, etc.)
- 13.4 Recognize how accessories can provide versatility to a simple outfit, incorporate fashion trends, balance and proportion, and functionality to an overall look of an outfit
- 13.5 Recognize quality construction features of different accessories (e.g., jewelry: plating, fasteners; handbags: lining, edging, and hardware)
- 13.6 Recognize methods used to identify counterfeit/knockoff goods (i.e., check quality of logo, stitching, labeling, materials, seams; compare with authentic items; retailer reputation; etc.)

### **STANDARD 14.0 ANALYZE ETHICAL ISSUES IN FASHION DESIGN AND MANUFACTURING**

- 14.1 Describe common ethical issues to be considered in sourcing and manufacturing (e.g., workers' rights, pollutants, energy efficiency, and animal rights)
- 14.2 Explain the more balanced approach to decision making with the "triple bottom line" framework (e.g., financial, social, and environmental) in defining a sustainable and responsible business
- 14.3 Differentiate between sustainable fashion (e.g., clothing, accessories, and footwear that are produced and consumed in ways that have a lower impact on the environment, considering the entire lifecycle) and ethical fashion (e.g., fair treatment of workers, including fair labor and fair wages)
- 14.4 Identify fashion businesses leading the way toward more sustainable and ethical fashion (i.e., Patagonia, H&M Conscious Collection, Eileen Fisher, etc.)
- 14.5 Identify actions taken within the fashion industry to support ethical design, manufacturing, and distribution (e.g., upcycling/recycling materials, "fair trade" and "cruelty-free" labeling, and green/sustainable design practices)
- 14.6 Explain the concept of greenwashing and the need for transparency and genuine commitment to sustainable and ethical practices in the fashion industry
- 14.7 Explain how the regulation of "green claims" are impacting the fashion industry (i.e., EU, UK, and US movement toward anti-greenwashing directives, regulations, laws, etc.)
- 14.8 Discuss how companies capitalize on "fast fashion" methods and the growing concerns about the environmental and social impact on the fashion industry
- 14.9 Identify advantages of sustainable fashion approaches and closed-loop systems intended to minimize the environmental and social impact of the fashion industry (i.e., repair, redesign, and upcycle; rent, lease, and swap; green and clean; preloved, secondhand, and gently used items; transparency and traceability; etc.)

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