

# STRANDS AND STANDARDS

## APPAREL DESIGN AND PRODUCTION II



### Course Description

Students will further strengthen and broaden apparel design and production techniques. In this course they design and construct intermediate level projects using various construction techniques. These skills prepare students for the exciting global apparel industry and entrepreneurial opportunities. This course will strengthen comprehension of concepts and standards outlined in Sciences, Technology, Engineering and Math (STEM) education. Student leadership and competitive events (FCCLA) may be integrated into this course.

<b>Intended Grade Level</b>	9-12
Units of Credit	0.5
Core Code	34.01.00.00.092
Prerequisite	Apparel Design and Production I or Sport and Outdoor Product Design I must precede this course
Skill Certification Test Number	353
Test Weight	0.5
<b>License Type</b>	CTE and/or Secondary Education 6-12
<b>Required Endorsement(s)</b>	
Endorsement 1	FACS General Composite
Endorsement 2	CTE License: Fashion/Design/Merchandising
Endorsement 3	NA

### STRAND 1

Students will increase knowledge and application of sewing machines, sergers, and pressing techniques.

#### Standard 1

Learn and apply sewing machine functions and adjustments.

- Machine stitch selection:
- Straight stitch: used for the majority of sewing
- Stretch stitch: used for sewing on knits or other times when you need the stitching to be able to stretch
- Blind hem: used to sew a blind hem, edge stitch or stitch in the ditch
- Zigzag stitch: classic zigzag stitch
- Buttonhole stitch: series of stitches used to create a buttonhole
- Stitch length and width (i.e., increase length for top-stitching, baste, easing, gathering; increase width for zigzag stitch)
- Needle position, size, type, and common needles:
- Universal: general purpose stitching and fabrics
- Stretch: stretch and knit fabrics
- Sharp: silks and artificial leather
- Jean: reinforced to handle extra thick woven fabrics without breakage or skipped stitches
- Presser foot selection and pressure (e.g., all-purpose foot, buttonhole foot, zipper foot, blind hem foot, rolled hem foot; less pressure for heavier fabrics, more pressure for lighter fabrics)

#### Resources:

<http://www.schmetzneedles.com/schmetz-household-needle-chart/#sthash.Ln3rVtxV.dpbs>

#### Standard 2

Learn to operate, thread, and maintain a serger.

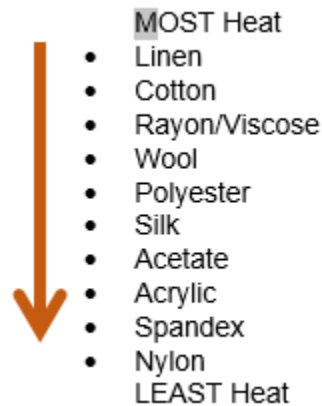
- Identify the needle stitch plate, feed dogs/system, presser foot, thread tensions, presser foot lever/lifter, handwheel, stitch length control, knives and loopers (overcast on the serger).
- Thread, operate, and care for serger according to machine manual (e.g., clean, oil).

#### Standard 3

Use pressing tools to create a professional product.

- Incorporate the practice of “press as you sew.”
- Use pressing equipment (e.g., tailor’s ham, sleeve board, seam roll, point presser, pressing cloth).
  - Tailor’s ham: for pressing curved areas of clothing (darts, shoulders, collars, etc.)
  - Sleeve board: narrow board for sleeves
  - Seam roll: oblong for long, project like sleeves

- Point presser: for narrow, hard-to-reach areas of collars, belts, cuffs, corners and points
- Pressing cloth: prevents scorching/melting of fabric
- Identify and use appropriate temperature settings for a various fabrics with different fiber content.



### Performance Objective 1

Thread, operate and care for the serger.

## STRAND 2

Students will distinguish the different types of fabric and fiber characteristics.

### Standard 1

Identify and review basic fibers (i.e., natural fibers include cotton, linen, silk, wool; manmade fibers include nylon, polyester, acrylic, rayon/lyocell, spandex, acetate).

Natural fiber characteristics: comes from plant and animals, moisture absorbent, more expensive

Cotton: absorbent, comfortable, durable, wrinkles, shrinks, easy to launder, plant source.

Linen: absorbent, natural luster, quick drying, wrinkles, frays, little stretch, plant source-flax

Silk: animal source-silk worm cocoon, absorbent, natural luster, insulating, strong, resilient, dyes well, expensive, degrades and yellows from age and sunlight.

Wool: animal source-fur, absorbent, strong, elastic, shrinks when laundered improperly, wrinkle resistant, warm

Manmade fiber characteristics: made from chemical compounds, heat sensitive/will melt, less absorbent to not at all absorbent, less expensive

Nylon: strong, elastic, water repellent, colorfast, frays easily

Polyester: good shape retention, easy to launder, wrinkle resistant, colorfast, blends well with other fibers, retains oily stains

Acrylic: resembles wool, soft, warm, nonabsorbent, pills, heat sensitive, can shrink or stretch

Rayon: soft and comfortable, drapes beautifully, blends well with other fibers, shrinks, poor shape retention, wrinkles, dyes well

Spandex: very elastic, adds stretch when blended with other fibers, requires stretch stitching techniques, shrinks

Acetate: high luster, drapes well, loses shape, wrinkles

- Introduce students to sustainable methods of fiber production.

**Resources:**

<http://www.cottoninc.com>

<http://www.globalfootprints.org/sustainability/> <http://www.undressrunways.com/fashion-sustainability/>

<http://www.triplepundit.com/special/sustainable-fashion-2014/>

<http://www.patagonia.com/us/environmentalism>

**Standard 2**

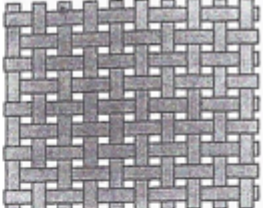

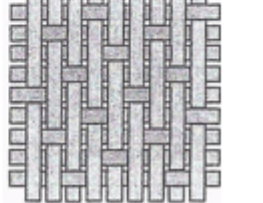
Identify various types of fabric construction.

- Identify basic weaves (plain, twill, satin)

Plain: yarns interlace at right angles, passing alternately over and under each other; strong, durable, easy to sew, wrinkles easily

Twill: one yarn passes over two or more yarns to create a diagonal pattern; soft, wrinkle resistant, hides soil.

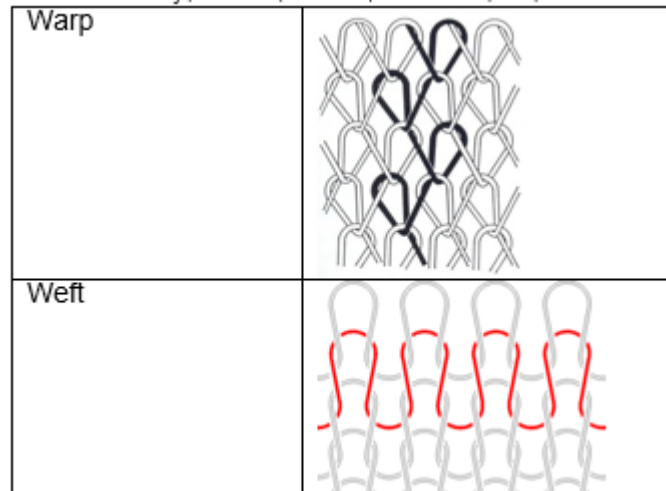
Satin: yarns float over four or more yarns, then pass under one; shiny, smooth surface, snags easily

Plain		
Twill		
Satin		

- Identify basic knits (warp and weft)

Warp: Tricot, tulle, lace

Weft: Jersey, velour, fleece, interlock, rib, fake fur



- Identify non-woven fabrics (e.g., felt).
- Identify specific fabrics such as broadcloth, chambray, corduroy, double knit, gingham, interlock knit, oxford, tricot, and velour.
- Broadcloth: plain weave cotton or cotton/polyester; tightly woven fabric with a faint rib pattern

Chambray: looks much like lightweight denim; plain woven fabric with a colored warp and a white filling that gives it a heathered look

Corduroy: piled, vertical rib design; napped fabric that comes in varying weights; often identified by the width of the ribs or wales

Double knit: two fabrics knitted together; made on a circular rib machine, with the two layers identical on each side; stable knit, less likely to curl or stretch out of shape

Gingham: checkered pattern, lightweight, plain woven cotton or cotton blend

Interlock knit: created on a knitting machine, with two separate one-by-one rib fabrics; soft, elastic, wrinkle resistant

Oxford: traditional shirting fabric with a warp of two fine yarns and heavier weft or softly spun fill yarn; subtle basket weave look and silk-like finish

Tricot: warp-knit fabric of various natural or synthetic fibers, as wool, silk polyester, having fine vertical ribs on the face and horizontal ribs on the back, used especially for making apparel

Velour: similar to terrycloth, but with cut loops; thick, short pile; can be a knit or a woven; soft to the touch; rich appearance

### Resources:

<http://www.powersewing.com/2009/07/fabric-photo-dictionary>

### Performance Objective 2

Perform a fiber identification lab. Use different ways of identifying fibers; for example, burn test, chemical test (acetone or bleach), or microscope observations.

## STRAND 3

Students will review and demonstrate pre-construction sewing techniques at the intermediate level.

### Standard 1

Students will independently take measurements and choose appropriate fabric and make pattern alterations.

- Determine pattern size based on body measurements and finished garment measurements. Look at finished garment measurements on pattern envelope and pattern pieces, then compare to body measurements to choose a good fit.
  - Natural waist, bust/chest, high bust, full hip, neck, sleeve length
  - Back-waist measurement, from prominent bone at base of neck to waist
- Review relationship between body measurements and pattern measurements and the use of ease (wearing ease, designing ease, layering ease, negative ease).

Wearing ease: amount added to a person's body measurements so one can move in a garment

Design ease: any amount of ease beyond the basic wearing ease that creates the style of a garment

Layering ease: amount of ease added to clothing that will be worn over other clothing

Negative ease: will measure smaller than actual body measurements, but will stretch to fit comfortably

#### Resources:

<http://www.craftsy.com/blog/2014/01/sewing-ease/>

### Performance Objective 3

Make fitting adjustments; demonstrate length and width pattern alterations.

- Use the suggested fabrics located on the back of the pattern envelope.
- Make pattern alterations (demonstrate length and width adjustments and back waist). Use the lengthen and shorten line on the pattern piece to add needed or take away inches.

Width adjustment: amount needed to be added divided by the number of seams

#### Resources:

<http://www.taunton.com/threads/pages/t00103.asp>

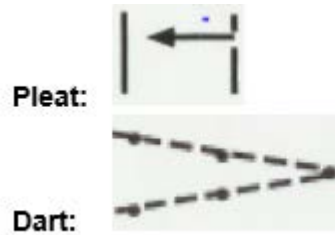
<http://www.threadsmagazine.com/item/5053/the-seam-method-of-pattern-alteration>

Betzina, Sandra. *Fast Fit, Easy Pattern Alterations for Every Figure*. ISBN-10 1561586498.

### Standard 2

Apply pattern preparation techniques.

- Review basic pattern symbols (e.g., straight of grain arrows, notches, pattern markings, buttons and buttonholes, place on fold line, sizing lines, adjustment lines).
- Identify pattern symbols (e.g., pleat, dart, finished garment measurements, center front or back).



Finished garment measurements: measurements of the garment after it is completed

Center front and back: where the center of the garment front or back is located

- Review pattern placement and layout on fabric (e.g., straight of grain is always parallel to the selvage; place on fold should be placed directly on the fold of the fabric; allows the garment to hang straight).
- Review one-way directional/nap layout (e.g., all pattern pieces must face the same direction; tops of the pattern pieces should be at the top of the direction of the design or nap).

### Standard 3

Use appropriate marking techniques.

## STRAND 4

Students will use correct sewing construction techniques at the intermediate level.

### Standard 1

Students will use correct sewing construction techniques at the intermediate level.

- Identify stitching techniques (e.g., dart, ease stitching, gathering, pleat, tuck, topstitching, understitching, stitch in the ditch, stay stitching, hem) and their applications.

**Dart:** The goal is to sew a dart with a point that is as smooth as possible. Stitch from the wide end to the tip, do not back stitch at the point.

**Ease stitching:** There are three ways to ease a seam: (1) gather before sewing the seam, (2) stretch the shorter seam as you sew the unequal layers together, or (3) let the machine ease the longer edge as the layers move under the presser foot.

**Gather:** Tiny, soft folds of fabric that form when a larger piece of fabric is sewn to smaller piece. The fabric should determine the best method of gathering to use. The goal is to create small, evenly spaced folds of fabric along the gathered area. There are four basic ways to gather: (1) rows of basting stitches, (2) machine couch a cord, (3) use a ruffler attachment or gathering foot, and (4) zigzag over clear elastic.

**Pleat:** All pleats involve folding fabric, and each folding strategy produces a different type of pleat (e.g., knife pleat, box pleat, inverted pleat).

**Tuck:** A stitched fold of fabric that is usually decorative, but can also be used to add shape to a garment; formed so that the fold and stitching show on the right side of the fabric.

**Topstitching:** A row of evenly spaced straight stitches visible on the right side of a garment; usually aligned parallel to an edge or a seam. Typical distance is 1/4" to 3/8"; however, it usually is a matter of taste.

**Understitching:** A technique when seam allowances are sewn to a fabric layer to help keep the fabric from rolling to the right side of the garment; invisible from the right side of the garment. Grade and clip seam allowances before understitching. Press seam allowances toward the facing.

**Stitch in the ditch:** Refers to machine stitching that is sewn in the "ditch" of a seam so that it sinks into the seam and stays out of sight.

**Stay stitching:** A row of permanent, straight stitches sewn on a single layer to prevent stretching in key areas when you're handling the garment during the construction process. The stitching should be done just inside the seam allowance (1/2" from the cut edge if seam allowances are 5/8"). No back stitch is necessary.

**Hem:** The finished edge on the bottom of a garment.

- Identify specialty threads (e.g., quilting, heavy duty, embroidery, metallic, elastic).

**Quilting:** a strong cotton thread with a waxy coating to prevent tangling when used in hand-quilting. It is not appropriate for use in sewing machine.

**Heavy duty:** Slightly heavier than all-purpose thread; to be used for prominent top-stitching.

**Embroidery:** Decorative thread offered in a wide variety of vibrant colors. Silky, lustrous, and versatile, it is weaker than regular sewing thread and should not be used for construction. It is used for decorative stitches.

**Metallic:** Add glitter and they are durable. All-purpose thread should be used on the bobbin; use metallic in upper looper on a serger.

**Elastic:** Used for stretch shirring; usually wound by hand onto the bobbin. The bobbin tension must be adjusted when using this type of thread.

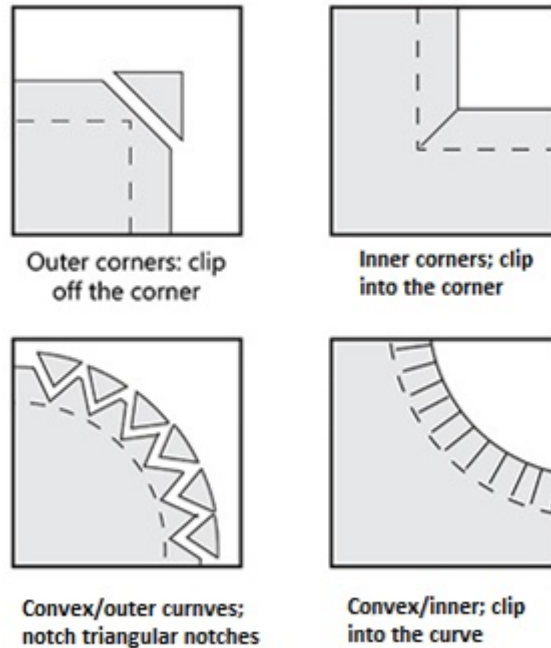
- Understand that serger thread is lighter-weight than all-purpose sewing machine thread.

### Standard 2

Use appropriate techniques for enclosed seams (e.g, clipping, notching, layering/grading, trimming).

- Clipping and notching a seam allowance make them more flexible. Clip a concave(inside) curve within 1/8" of the stitching so the seam allowance outer edge can spread when turned back to release tension of the seam. Notch a convex (outside) curve by cutting away V-shaped wedges from the seam allowance to remove bulk.





- Trimming refers to reducing any seam allowance wide. Grading is more specific and is done on enclosed seams where the layered seam allowances create excess bulk. Trimming is done on collars, lapels, facings, and underarms. To grade a seam allowance, trim the side closest to the outer portion of the garment to  $1/8''-3/16''$ , then trim the other allowance  $1/4''-3/8''$ .

### Standard 3

Practice correct application techniques for applying interfacing and attaching facings or collars.

- Interfacing can fulfill the following functions: (1) reinforce edges, such as hems and front openings; (2) provide added body; (3) create stability in buttonholes; (4) prevent stretch in areas like a waistband or upper back; (5) build shape in lapels and collars; and (6) provide a crisp finish in areas such as pockets.
- Select and apply appropriate interfacing (fusible, non-fusible).
  - Sew-in/non-fusible interfacing must be anchored to the garment with stitches, either sewn into a seam or sewn onto a layer of fabric before being sewn into the garment. To apply, sew the interfacing to the wrong side of fabric within the seam allowance.
  - Fusible interfacing is attached to the fashion fabric with glue activated by heat from the iron. To apply non-fusible, use heat, moisture and a press cloth. Follow the manufacturer's instructions.
  - Choose between sew-in/non-fusible and fusible based on the project fabric, the garment's requirement and preference.
- Demonstrate techniques associated with attaching facings or collars.

- Facings used to finish edges at necklines, armholes, front and back openings, hems, vents, and slits. Facings add support, prevent the edge from stretching and ensure a flat, crisp outer edge.
- Three types of collars: flat (Peter Pan), rolled (stands up slightly on the neck) and standing (Mandarin).

**Standard 4**

Identify each of the following and construct one or more: darts, pleats, and gathers.

Term	Illustration	Tips
Darts		<a href="https://blog.colettehq.com/tutorials/tutorial-sewing-darts">https://blog.colettehq.com/tutorials/tutorial-sewing-darts</a>
Pleats		<a href="http://shwinandshwin.com/2011/08/sewing-101-pleats.html">http://shwinandshwin.com/2011/08/sewing-101-pleats.html</a>
Gathers		<a href="http://www.nancyzieman.com/blog/sewing-with-nancy/how-to-sew-perfect-gather/">http://www.nancyzieman.com/blog/sewing-with-nancy/how-to-sew-perfect-gather/</a>

**Standard 5**

Identify uses and application of commercially prepared bias tape.

Single or double fold, bias cut fabric strips have pre-folded edges that meet in the middle to bind raw fabric edges. They are prepackaged in several widths and come in a wide variety of colors, but you can make your own.

- Identify types of bias tape (single-fold, double-fold).  
 Single-fold tape has two folds. Each long edge is folded 1/4" to the center on the bias wrong side. Comes in varying widths.  
 Double-fold tape starts as a single fold strip, then it's folded in half again, either exactly down the center, or with one side slightly wider (to be placed on the underside when it's stitched, so the topstitching is sure to catch it). Comes in varying widths.

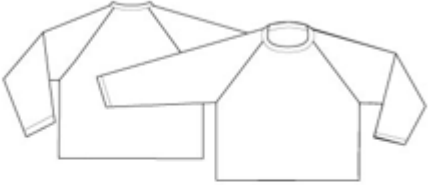

- Identify uses of bias tape (seam finish, hemming, facing, and trim).

**Standard 6**

Identify each of the following sleeves: raglan and set in (i.e., closed/round method and open/flat method).

Raglan sleeves (two-piece and one-piece) join the bodice in a diagonal seam that extends from the neckline to the side seam.

Set-in sleeves are joined to the garment bodice at a seam that circles over the shoulder and under the arm. A well-made set-in sleeve meets at the shoulder in a pucker-free, smooth, curved seam. Two methods of construction: closed/round method and open/flat method.

Sleeve Style	Illustration
Raglan	
Set-in	

**Resources:**

- <http://www.threadsmagazine.com/item/15345/video-sleeves-101>
- <http://www.tillyandthebuttons.com/2014/11/sewingfrancoise-sewing-raglan-sleeves.html>
- <http://www.craftsy.com/blog/2014/02/sewing-in-set-in-sleeves/>

**Standard 7**

Identify each of the following zipper applications, and construct one or more: centered, lapped, fly, exposed/sport, invisible.

Centered zippers are found on a variety of garments, including dresses, skirts and pants.

Centered zippers align the seam over the zipper teeth and the zipper tape is covered by symmetrical overlaps on each side. Parallel lines of topstitching flank the seam.

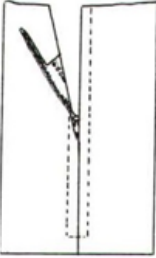
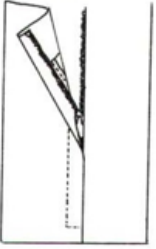
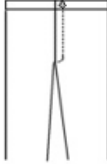
Lapped zippers are sewn to completely hide the zipper under a flap of fabric, and are found in skirts, pants, and center backs of dresses.

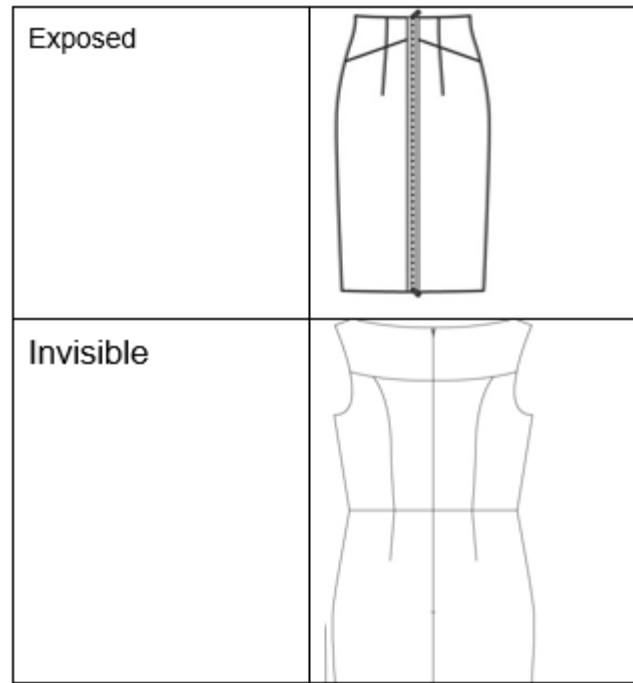
Fly zippers are used in pants. Women’s garments lap right over left, and men’s garments lap left over right.

## APPAREL DESIGN AND PRODUCTION II

Exposed zippers are sewn directly on the outside of the garment. The zipper tape becomes a decorative feature. When installing an exposed zipper, turn the seam allowances to the right side, topstitch the zipper over the seam allowance to cover the fabric edge.

Invisible zippers, when inserted correctly, are unnoticeable except for the zipper pull. They are incredibly flexible and soft, making them ideal for fine fabrics.

Zipper Type	Illustration
Centered	<p data-bbox="841 485 899 506">Centered</p>  A technical diagram showing a zipper being installed on a rectangular piece of fabric. The zipper is centered along the vertical edge. A dashed vertical line indicates the center line of the zipper. A diagonal line represents the zipper pull, and a small triangle indicates the zipper teeth meeting at the top.
Lapped	<p data-bbox="841 779 889 800">Lapped</p>  A technical diagram showing a zipper being installed on a rectangular piece of fabric. The zipper is lapped, meaning one side of the zipper tape overlaps the other. A dashed vertical line indicates the center line of the zipper. A diagonal line represents the zipper pull, and a small triangle indicates the zipper teeth meeting at the top.
Fly	<p data-bbox="805 1094 927 1115">Front Fly Zipper</p>  A technical diagram showing a zipper being installed on a rectangular piece of fabric. The zipper is a front fly zipper, meaning it is installed on the front of the garment. A dashed vertical line indicates the center line of the zipper. A diagonal line represents the zipper pull, and a small triangle indicates the zipper teeth meeting at the top.



Resources:

<http://www.nancyzieman.com/blog/sewing-with-nancy/how-to-sew-a-zipper>  
[http://extension.usu.edu/files/publications/factsheet/FC\\_Clothing&Textiles\\_2012-02pr.pdf](http://extension.usu.edu/files/publications/factsheet/FC_Clothing&Textiles_2012-02pr.pdf)  
<http://www.threadsmagazine.com/item/3831/video-easy-to-sew-flat-fly-front-zipper>  
<http://www.craftsy.com/blog/2013/12/sewing-exposed-zippers/>  
<http://www.craftsy.com/blog/2014/02/how-to-sew-an-invisible-zipper>

### Standard 8

Identify types and complete correct application of hems.

- Identify steps of hem preparation (i.e., appropriate length and width, reduce bulk, ease, pressing).
- Apply correct edge finishes (e.g., clean finished, zigzag, serged).
- Complete one or more of the following hemming techniques: hand stitched hems, double fold hem, machine blind hem, rolled hem.

Resources:

<http://www.craftsy.com/blog/2014/12/how-to-hem-skirts-and-pants>  
<http://www.sew4home.com/tips-resources/sewing-tips-tricks/how-make-simple-hem>

### Performance Objective 4

Complete all of the following skills as part of the course. A minimum of 9 skills need to be included as part of an apparel or accessory/personal item project.

- Stay stitching
- Trimming
- Grading
- Clipping or notching
- Understitching

## APPAREL DESIGN AND PRODUCTION II

- Darts, tucks, pleats, or gathers
- Select and apply interfacing
- Sew one or more correct sleeve style (i.e., set in, raglan)
- Demonstrate one or more correct zipper applications
- Attach one or more appropriate closure (i.e., hook and eye, snap, pant/skirt hook)
- Complete two of the following hemming techniques: hand-stitched hems, double fold hem, machine blind hem, rolled hem or other hemming technique
- Demonstrate the application of bias tape

### Performance Objective 5

Use commercially prepared directions/guide sheets.

### Skill Certificate Test Points by Strand

Example table below. Refer to instructions for specifics.

Test Name	Test #	Number of Test Points by Strand										Total Points	Total Questions
		1	2	3	4	5	6	7	8	9	10		
Apparel Design and Production II	353	13	15	16	25							69	69

### Performance Objective

#### FCCLA Integration into Apparel Design and Production II:

**STAR Events:** Career Investigation, Illustrated Talk, Interpersonal Communications, Job Interview, Life Event Planning, Advocacy, Chapter Service Project Display, Chapter Service Project Portfolio, National Programs in Action, Clothing Construction, Fashion Design.

**Skill Demonstration Events:** Impromptu Speaking, Fashion Sketch

**National Program:** Career Connection, Power of One.