



# The Package

Distance Learning Course 3  
Sports Bra Pattern Cutting and Grading



Continuing professional development studies

This certifies that

.....  
has successfully completed the training  
programme for

Sports Bra Pattern Cutting and Grading  
.....

Signed

Date



## Distance Learning Course 3 Sports Bra Pattern Cutting and Grading Guide to Course Content

1. Programme Overview
2. Sports Bra Development
3. Biomechanics
4. The Anatomy of the Sports bra
5. Fabrication & components
6. Pattern Drafting Tools
3. Plus Fit Bra engineering
4. Plus Fit Body Anatomy
5. Overview of Sports Bra styles
6. Pattern Drafting Methods
7. Project Draft Level 1 Soft bra block and Racer Back style
8. Sports Bra Grading
9. 34B Molded Wired Bra Block
10. Project Draft Level 2 Molded bra style
11. Project Draft Level 3 Wired Bra style
12. Level 2 Asymmetric Grading
13. Sports Bra Bra Fitting
14. Technical Packs, costings and manufacture





## David Morris IA Technical

I joined this industry nearly 50 years ago when I became a student at Leicester Polytechnic on a course called Foundation Garment, Lingerie and Swimwear Design.

Three years later I graduated and joined Triumph International as a lingerie designer.

I worked as a technical designer for the next 30 years in a number of international companies.

In 1996 I became a lecturer in Contour Design at the De Montfort University in the UK.

I retired in 2014 from the university but continued as a consultant in our industry.

I publish IA Technical, a magazine that specialises in the technical content of our industry, I deliver technical training courses in the UK and overseas and I manage a number of small private label lingerie start-up companies



## Distance Learning Course 3 Sports Bra Pattern Cutting and Grading

### **Biomechanics**

is the sport science field that applies the laws of mechanics and physics to sports bras, in order to gain a greater understanding of performance in athletic events through modelling, simulation and measurement.

It is also necessary to have a good understanding of the application of physics to sport, as physical principles such as motion, resistance, momentum and friction play a part in most sporting events.

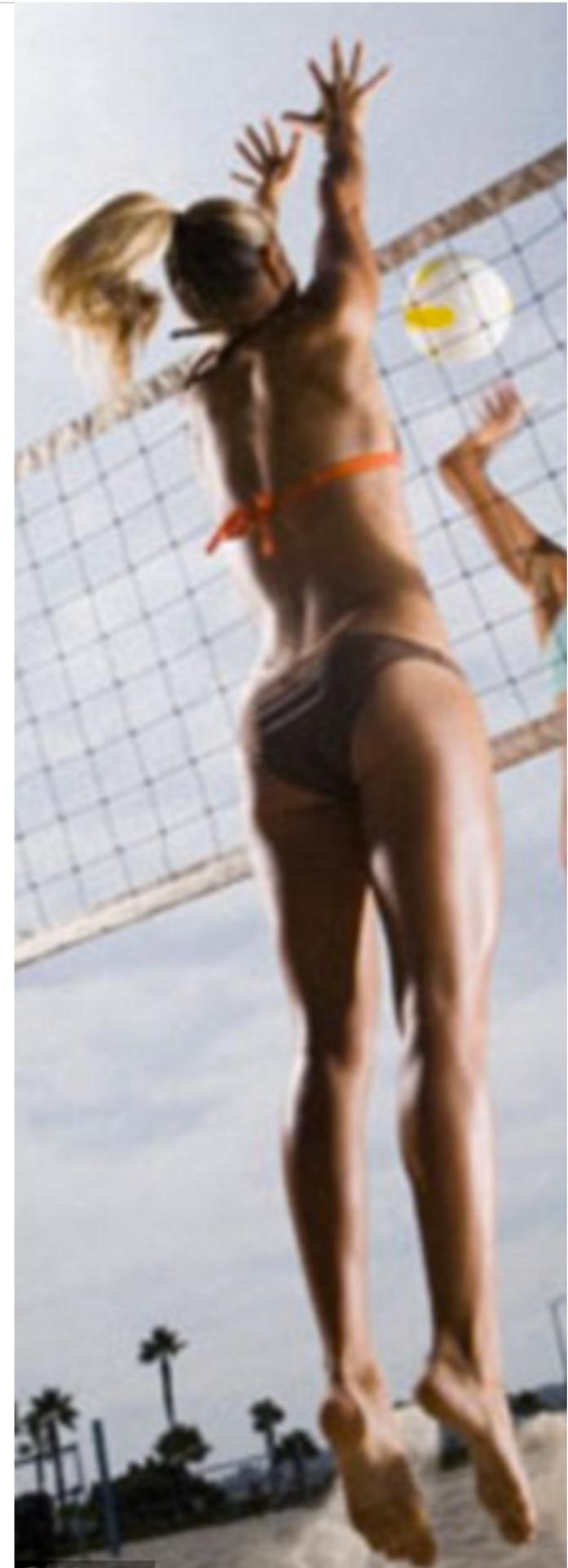
### **Newtons first law of motion:**

an object at rest will remain at rest, and an object in motion will remain in motion, at a constant velocity unless or until outside forces act upon it.

An illustration of this is a female athlete high-jumper, wearing a sportsbra. As the athlete is running down the track at 15mph her breasts within the sportsbra are also moving forward at the same rate. As the jump ensues and she reaches the maximum height her breasts will for a split second continue to rise due to the inertia of the jump whilst the athlete is falling, and cause a whiplash of pain and damage to the breast tissue.

The same inertia also explains what happens when an athlete makes a sudden quick left turn. Though the athlete's legs turn instantly her forward moving breasts will be damaged by the force of inertia and the higher the speed of movement the greater the damage.

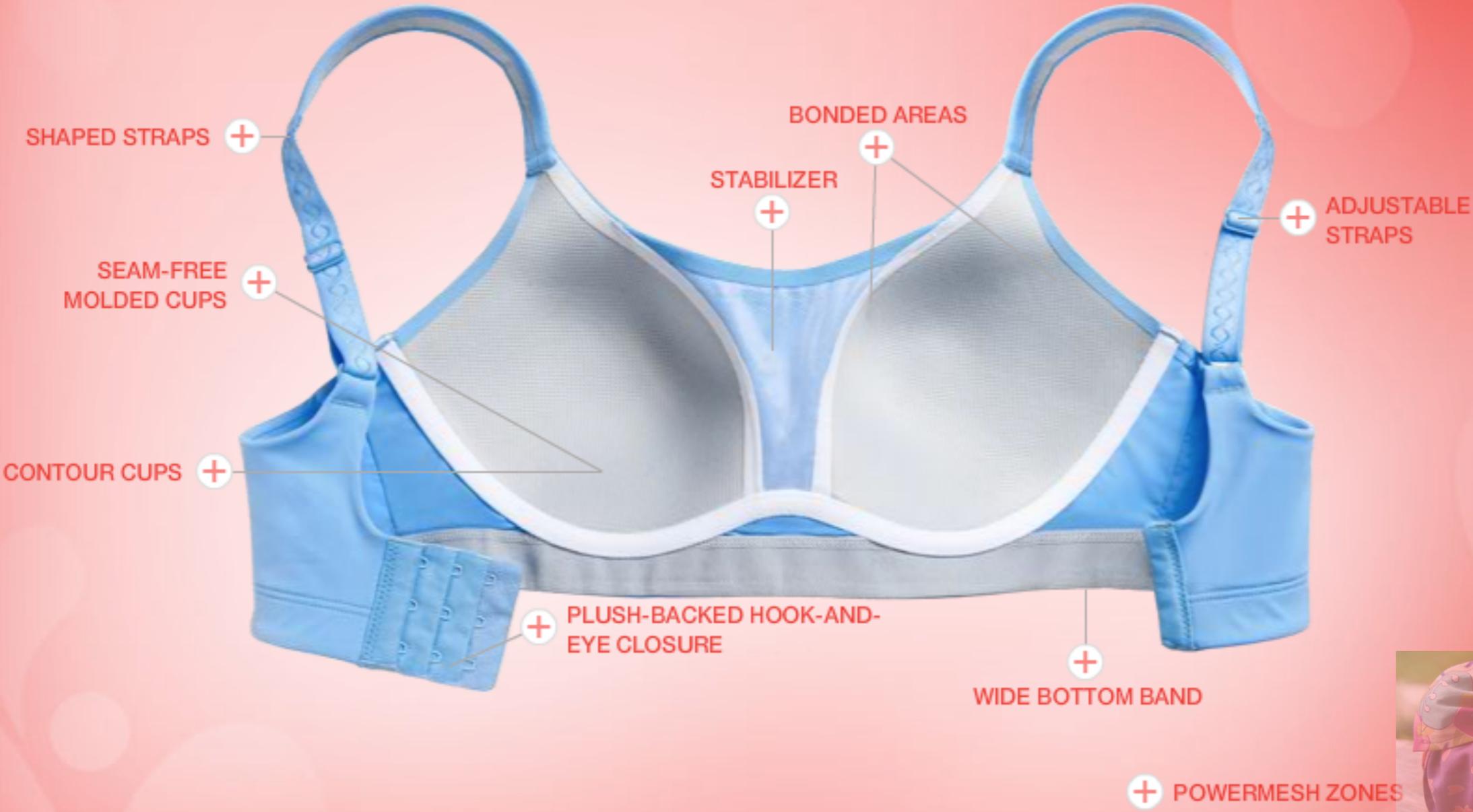
72% of females report breast pain during extreme vertical movement



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Basic Bra engineering

*Sports Bra*  
GLOSSARY

ANATOMY OF A SPORTS BRA



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Masking and drafting a Sports Bra on the stand



This technique can only be practised on a plastic stand. It is a pattern cutting system that shoe designers use.

The area of the stand that the bra covers should be masked with a double layer of short lengths (10cm) of paper masking tape, each strip should overlay the previous by 50%. Two opposite layers of masking tape should cover the modelling area



# Distance Learning Course Sports Bra Pattern Cutting and Grading Pattern Drafting Tools

Get a ream of A3 White Printing paper for drafting



Mechanical pencil 0.5mm + 2H leads



Compass



Bendy Ruler



Flexi Curve



General purpose scissors

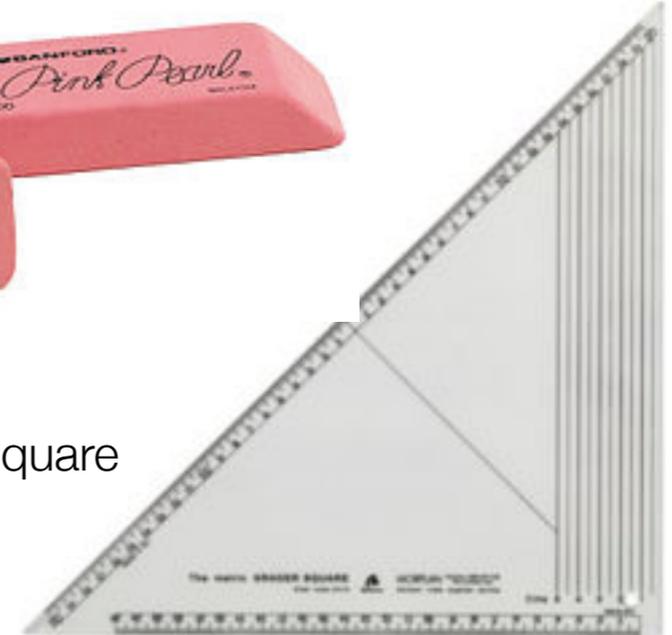
Tracing Wheel



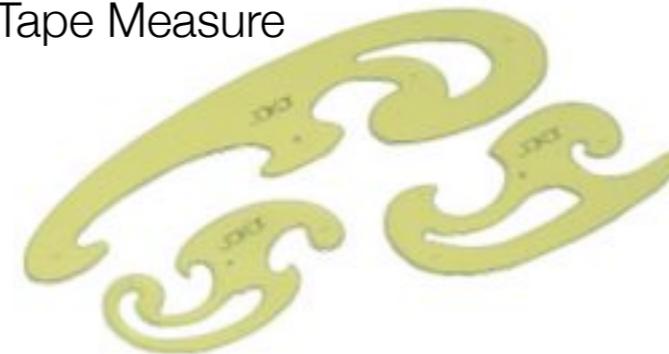
Eraser



Set Square



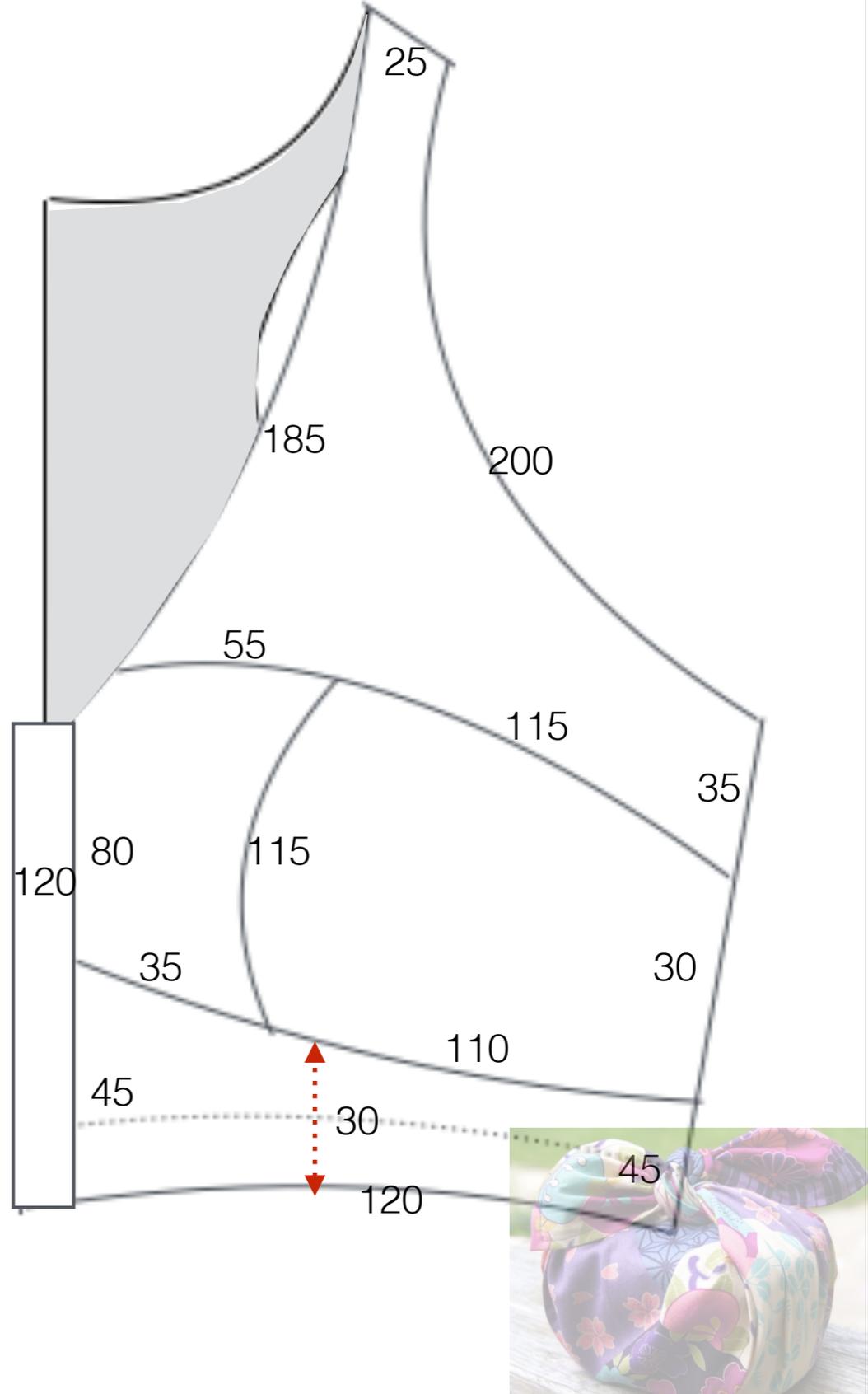
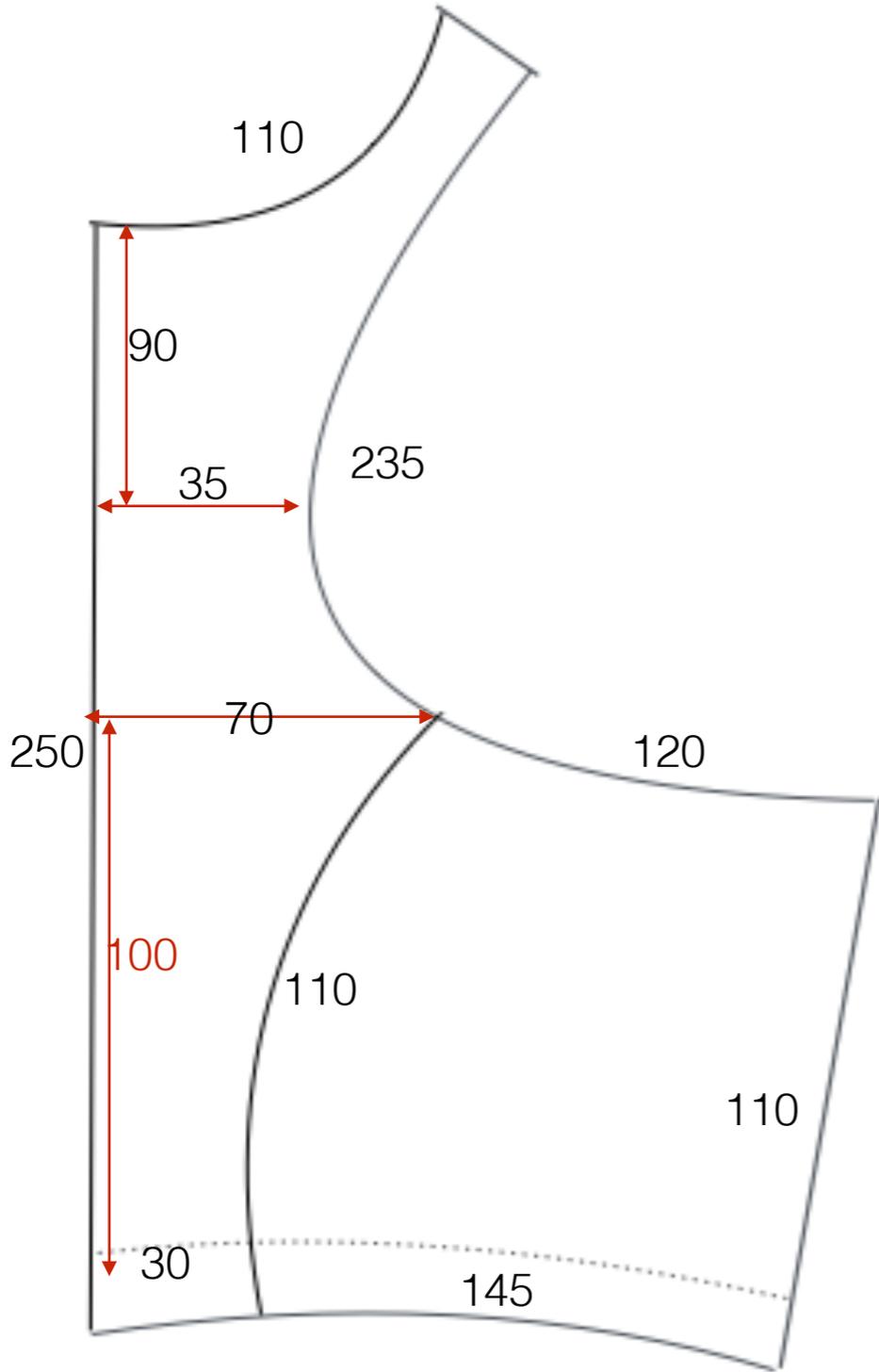
Tape Measure



French Curve (Discard small shapes)



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Pattern generation



## Distance Learning Course 3

### Sports Bra Pattern Cutting and Grading

### Basic Body Anatomy

The international Intimates industry has been using the 34” B cup size as their sample size for Core fit lingerie for 50+ years. Some European countries convert it to a metric version 75cm from the rib cage measurement of the fit model, (Germany and Japan) and others use 90cm from the overbust measurement of the fit model, (France and Spain).

To complicate this standard, America’s version is a 34A, Australia & New Zealand call it a 12A. In Italy it is a 2B.



If you use the simple measuring formula of Underband and Overbust measurement, all the body shapes above would measure 34B / 75B / 90B

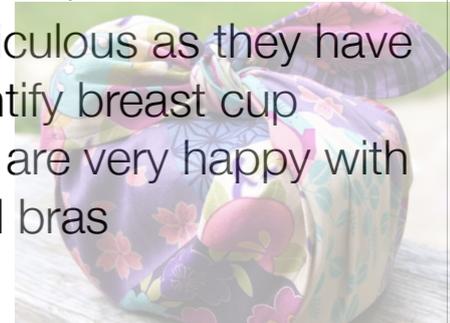
Its not difficult to recognise that they have very different breast shapes and across back measurements so they will fit any 34B bra in very different ways.



#### Fact

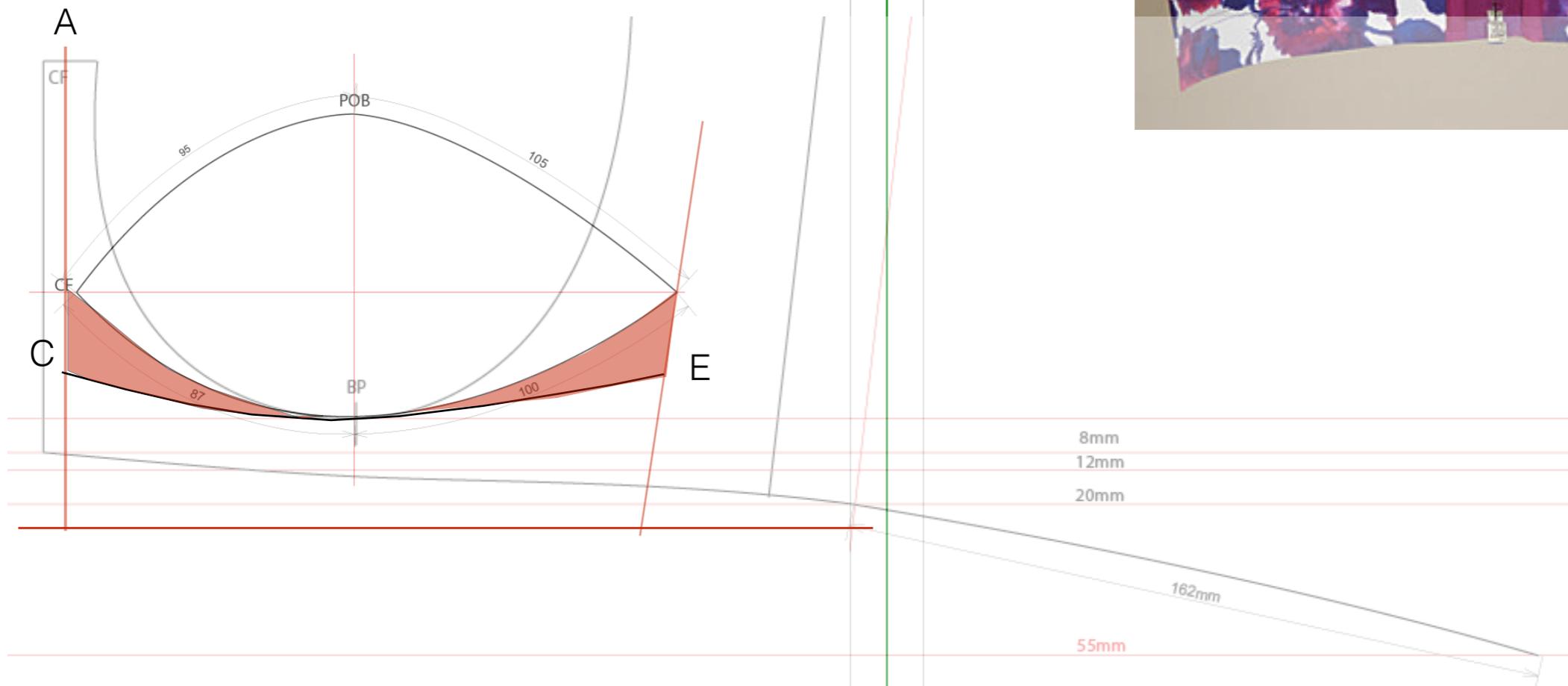
1. Every women’s breast volume and shape is as unique as their fingerprint
2. Breast and band size can change daily, breast volume due to hormonal activity and band size by hydration

For our Retail industry to declare that 70% of women are wearing the wrong sized bra is ridiculous as they have no scientific research to identify breast cup measurements and many women are very happy with their “ wrong” sized bras



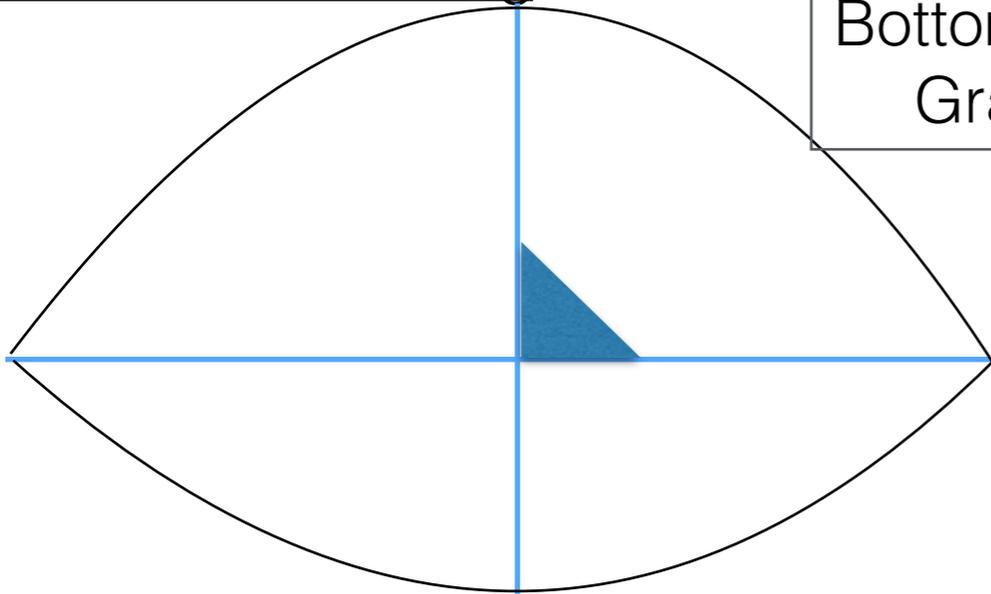
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34B Soft Bra Draft

Consider that this Sports bra bottom cup  
It has to be modified to fit the new cradle shape.  
The shaded areas need to be 'grown' onto the  
bottom cup soft bra block

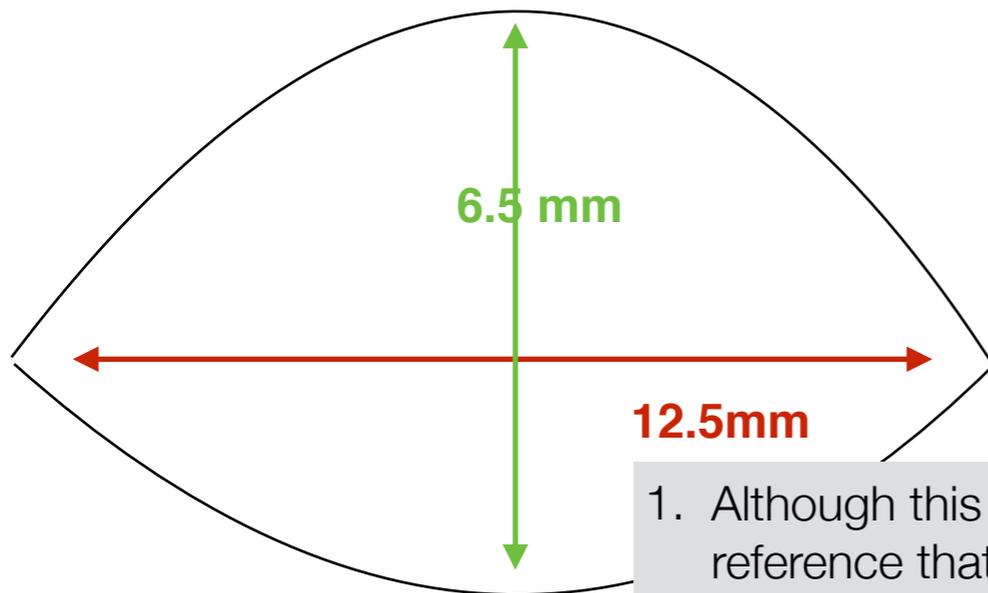


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Sports Bra Pattern Cutting and Grading  
Level1 Basic Grading

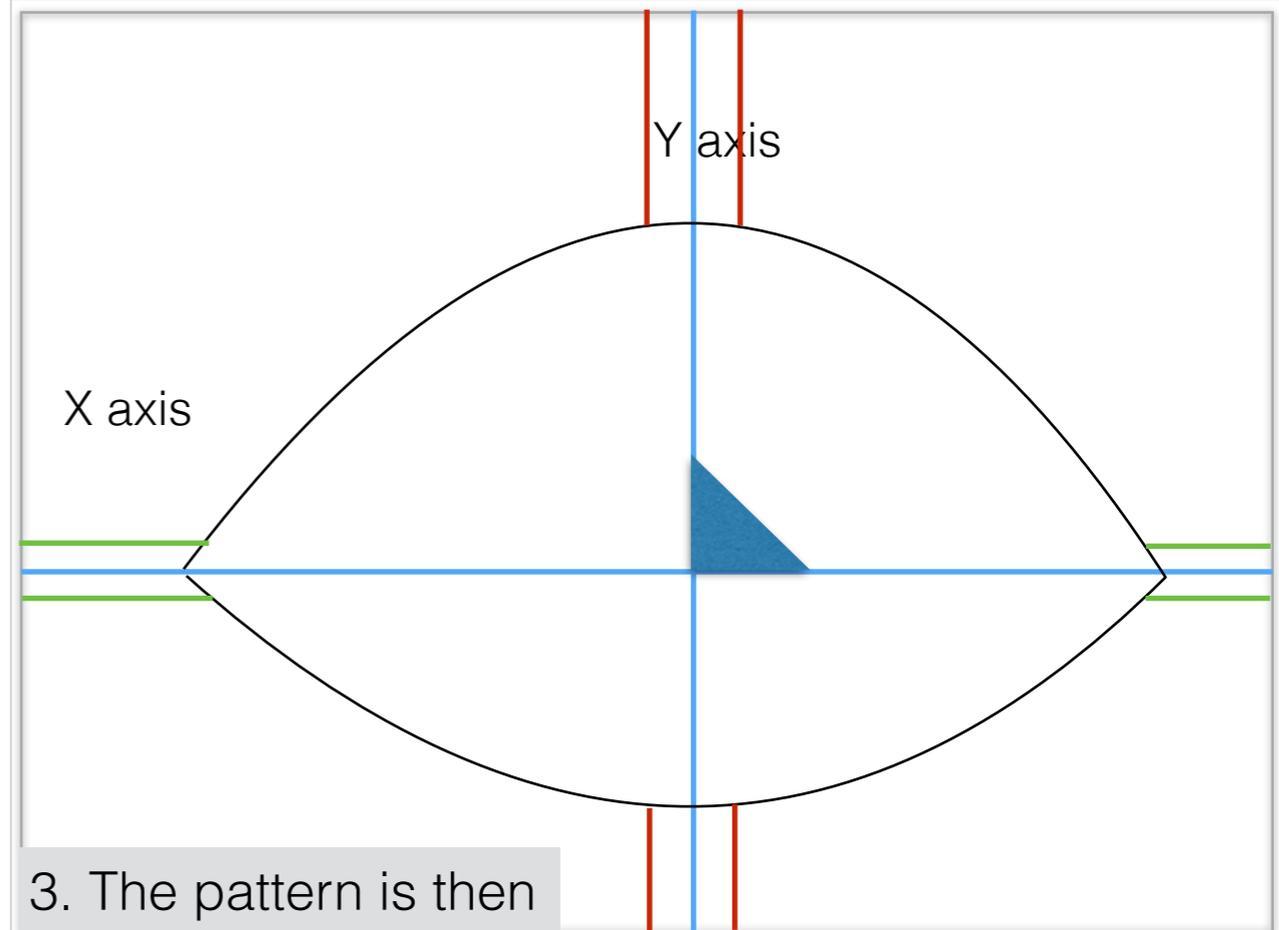
Bottom Cup  
Grade



1. The classic grade for this bottom cup is **12.5mm in the width (X axis)** and **6.5mm in the height (Y axis)**, it must be symmetrical grade to the top cup



1. Although this industry has a historical guide frame of reference that it pays lip service to, there is no proven, published size data that explains or offers best practice to control our size grading practice.



3. The pattern is then shifted to align with the **red** and **green guide** lines



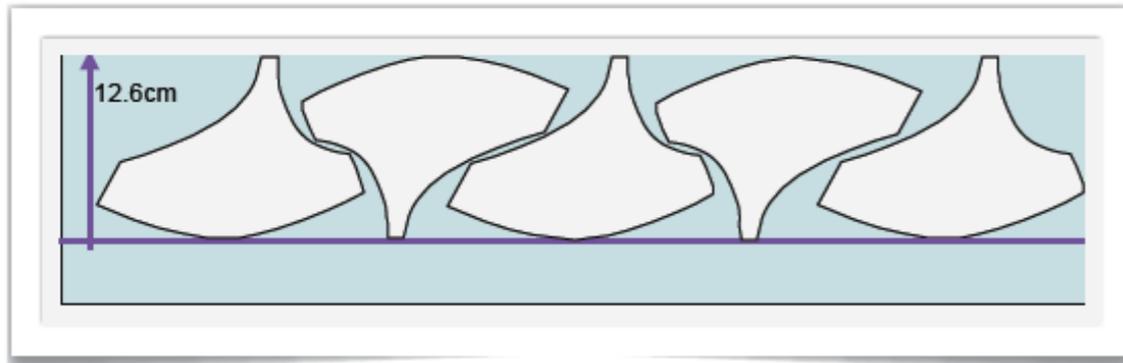
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## Sports Bra Pattern Cutting and Grading

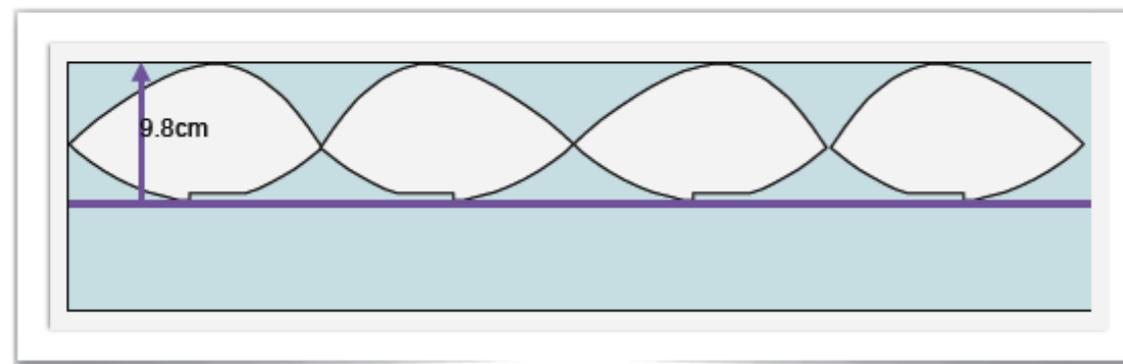
### Technical Packs

#### *Base Size lay plan (36D/38D)*

*"Avoid using the 34B for a sample lay plan costing. Use at least the 36D or even 38D as the current size ratio of orders are tending to be larger than ever before."*  
(Industry quote)



The method of producing a sample base size lay plan is to mark in each pattern piece across the width of its fabric. Make sure the pattern is on its straight grain and marked in as a pair. Butt the patterns up as tightly as possible to reduce the waste and then rule off the depth of fabric used. Divide the number of pairs of patterns into the amount of fabric used and this will give the amount of fabric used for 1 bra section. If the layout does not give a set of complete pairs, for this base size lay plan, discard the odd pattern



Repeat the process for each pattern in their appropriate materials

Product Data Management / Technical Pack.

If you don't define the specifications of your product, how can you complain when it is delivered faulty?

Over the past 25 years most core brands have given all the technical development of their product to manufacturers offshore. The only positive outcome of this was the development of sophisticated PDM's or Technical Specification Packs.

Product data management is the use of a software package to track and control information related to an Intimate Apparel product. The data involves the technical specifications of the product, specifications for manufacture and development, and the types of materials that will be required to produce goods. The use of product data management allows a company to track the various costs associated with the creation and launch of a product. Product data management is part of product lifecycle management.

In the early days of offshore production most brands would send a basic technical pack that would have consisted of;

1. A sealed sample, one of two identical samples that represented the final approved construction, one is held by the customer and second by the factory.
2. A Production order with a delivery date.
3. A graded set of patterns
4. A Fabric and component list with details of fabric usage and colour swatches.
5. The Method of Garment manufacture



# IA Technical Intimate Apparel and Swimwear Distance learning courses

As a distance learning student, you understand how the flexibility of learning can be integrated into your lifestyle and career path. Setting both short- and long-term goals gives you the impetus to create the life that you want and the career that you will enjoy.

Distance learning students must take a far more active role in learning and accessing information than traditional students in face-to-face classrooms. Rather than simply sitting through a class and jotting notes, you must take the initiative to download and read course materials.

You may need to ask questions via email, skype or facetime

If you are simply rushing through without thinking, you will not retain the information.

We suggest writing down what you discover in a notebook and referring back to it each time you start a new learning session.

Organisation is key to distance learning success! We recommend keeping a physical binder with sections such as Week 1, Week 2, as it allows you to pick up and go at any moment.

*Regards*

*Dave*

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