

# Course sample

Please note that due to copyright reasons, some images may be greyed out in this course sample.

Open College of the Arts

0800 731 2116

[enquiries@oca-uk.com](mailto:enquiries@oca-uk.com)



## Textiles 2

# Developing Creative Textiles



Level HE5 – 60 CATS

This course has been written by Pat Moloney

Open College of the Arts  
Michael Young Arts Centre  
Redbrook Business Park  
Wilthorpe Road  
Barnsley S75 1JN

Telephone: 0800 731 2116  
Email: [enquiries@oca-uk.com](mailto:enquiries@oca-uk.com)  
[www.oca-uk.com](http://www.oca-uk.com)

Registered charity number: 327446

OCA is a company limited by guarantee and registered in England  
under number 2125674.

Copyright OCA 1999; revised 2007; 2010

Document control number: t2dct110111

No part of this publication may be reproduced, stored in a retrieval  
system, or transmitted in any form or by any means – electronic,  
mechanical, photocopy, recording or otherwise – without prior  
permission of the publisher

Front cover: *Dye Souk, Marrakech.*

# Contents

Before you start

## Part one **Fibres – the importance of touch**

**Project 1** Designing textiles for a living space

**Assignment one**

## Part two **Dyeing**

**Project 2** Natural dyes

**Project 3** Synthetic dyes

**Project 4** Experimenting with dyeing

**Assignment two**

## Part three **Designing a scarf**

**Project 5** Designing a scarf

**Assignment three**

## Part four **The development of contemporary textiles**

**Project 6** A research project

Textiles from other cultures

Influential designers and movements

Textile art

**Assignment four**

## Part five **Your personal project**

**Option 1** Designing for a product

**Option 2** Working conceptually

## **Assignment five**

### **Appendices**

Appendix 1 Yarns and fibres

Appendix 2 Suppliers of materials and yarns

Appendix 3 Reading and resources

Guidelines for submission for formal assessment

Pre-assessment review

# Part two Dyeing



Tie dyeing and dip dyeing in Marrakech

This part of the course will introduce you to some of the many possibilities of using dyes in textile work. This is a chance to concentrate on working with colour in a very practical way. It can be a magical time in which you surround yourself with colour, really becoming absorbed in the feel of colour for its own sake.

People are often rather anxious about dyeing because of the measuring and the chemistry involved. Don't worry – it's rather like

cooking. Simply choose the right ingredients and the right utensils and follow the instructions carefully.

Before you start to work with the dyes, refresh your knowledge of colour theory. You'll find some recommended books on colour in Appendix 3. Working with dyes is very similar to working with paints, so you need to remind yourself about the colour circle, about how colours react to one another, and how colours are mixed. Sharpen your eye to colour once again and remind yourself of some of the transformations involved, some of the alchemy. Colour and dyes are key elements in the creation of textiles, creating mood, richness, emotion and interest.

## Research point

Look at the work of some of the great colour painters, for example the Impressionists or the German Expressionists. Make notes in your learning log about painters whose use of colour you particularly admire; add some images. Go out for walks and look at colour. Take photographs of the landscape, sunsets, autumn, spring flowers, etc. Visit museums or look at books on ethnic costume, Indian painting and the colours used in the art of other cultures. Look at the work of textile designers and textile artists who use colour expressively. Look for contrasts – the artists who use colour in a dynamic way and those who use colour with great subtlety.

Make a sketchbook with the information and resources that you've collected and saturate your mind with colour before you begin.

Because dyeing is a complex subject and involves quite a lot of preparation, read through Part Two carefully before you start the projects to give yourself plenty of time to collect the various materials

and equipment you'll need. Consult the reading list for this part of the course (see Appendix 3). The first project is concerned with natural dyes; the second is about using synthetic or man-made dyes; the third project explores ways of experimenting with dyes to produce interesting effects on fabrics and yarns. For all three projects, you'll be learning basic techniques and producing a range of samples. These will give you some new ways of approaching design that you'll be able to use in Assignment Three, which gives you the opportunity to produce a finished end product.

As a rough guide, spend around three weeks experimenting with *either* natural dyes (Project 2) *or* chemical dyes (Project 3). You can come back to the project you didn't try later, if you still have time when you reach the end of Part Two. The preparation processes and dyeing times required for natural dyeing are quite lengthy so bear this in mind when choosing your projects or when planning your time. Spend a further three to four weeks exploring dyeing techniques. If you prefer to organise your time differently or do more projects, you're free to do so.

## Dyes and dyeing

Dyes basically fall into two categories: *natural* dyes that come from animal, vegetable or mineral sources and *man-made* or *synthetic* dyes.

### Natural dyes

Natural dyes have been in use for the last 7,000 years and include colour obtained from exotic sources like sea snails, cochineal, madder, weld and indigo, and far more homely sources such as onion skins, blackberries, bracken and marigolds. Many of the traditional textile-making communities in the world stopped using natural dyes when chemical dyes became readily available in the 20<sup>th</sup> century, almost to

the point that the old recipes and skills were about to be lost. However, various individual initiatives and projects in recent years have encouraged these dyers to return to their traditional methods of natural dyeing and the interest shown by craft dyers in the western world means that the knowledge and skills of this ancient craft are being kept alive. Some dyers prefer to use only the dyestuffs with historical significance, such as madder, weld and indigo, whereas for others the pleasure of growing their own dyestuffs is part of the fascination.

Many natural dyes will not adhere to a fabric very easily on their own and richer colours will be obtained if some kind of 'mordant' or fixing substance is used beforehand. Chemical mordants are metallic salts. If you're worried about using chemicals, use only the substantive dyes i.e. dyes that will fix without the use of mordants.

The use of mordants does affect the colour of the dyestuffs and so a variety of shades can be obtained from just one dye-bath by dyeing several skeins of yarn, each of which has previously been treated with a different mordant.

## Synthetic dyes

Synthetic dyes have a shorter history, but are equally fascinating. It's hard to believe that they've only been around for 150 years or so, and of course, they are still being developed. The chance discovery of a mauve colouring by 18 year old William Perkin, a student at the Royal College of Chemistry, led to the first aniline dyestuff in 1856. Perkin set up a small laboratory in his parent's house in the East End of London to continue his research, experimenting with coal tar, an organic substance originating from ancient fossilised trees. While washing out his glass equipment one evening, he noticed a dark residue which produced a beautiful colour. Perkins called it Tyrian

purple. Coal tar proved to hold the potential for creating any number of colours and within a decade the paint and dye industry had been transformed.

There are now thousands of different dyestuffs, and many trade names. Fortunately, all this is regulated by the Society of Dyers and Colourists who set technical standards for testing colours

[www.sdc.org.uk](http://www.sdc.org.uk)

## **Dyestuff safety**

Please read carefully the notes on safety procedures for using dyestuffs. Dyestuffs can be hazardous if not handled properly. Working safely with dyes is largely a matter of common sense and adopting good working practices.

### **Dyeing – health and safety**

Always observe the following safety guidelines:

- Protect skin by wearing rubber gloves. Surgeon's gloves are good because they allow you to feel through them better. Keep a supply and replace frequently.
- Wear protective clothing, an apron or an overall, but don't leave it lying around the house. Store it away from the rest of your clothes when not in use.
- Avoid inhaling dye powders, fumes or vapours from dye pots. Be very careful opening packets or tins of dye. Open them and disperse slowly so as to create as little disturbance as possible. It is wise to wear a mask when handling dye powders: a simple one from a DIY shop is sufficient but if you're going to work

with quantities of powder over a long period, invest in a fume mask. If you wear contact lenses, consider wearing goggles.

- If you experience any allergic reaction to dyes or chemicals, seek medical advice immediately. Take particular care during pregnancy. Keep a first aid box handy and include an eye-wash. Always wash in warm soapy water after you've used dyes. If you splash dye liquid or chemicals into your eyes, rinse them immediately with clean water.
- Don't eat, drink or smoke in the dyeing area.
- Keep a completely separate set of utensils for dyes that you *never* use for cooking, including pots and containers, stirring and measuring equipment.
- Avoid dyeing in the kitchen if possible. If you do use your kitchen, always clean surfaces thoroughly and put everything away when you've finished. Cover your work surfaces with a few layers of newspaper before you start dyeing. When you've finished, throw them away and carefully wipe clean the surfaces underneath.
- Use suitable containers for dyes and chemicals such as glass jars or plastic containers. Make sure they are labelled clearly and securely closed when not in use. Store dyes and chemicals well out of the reach of children and pets.
- Don't leave half-used packets of dye lying around; mix stock solutions. Use a clean dry spoon for measuring out quantities of dyestuff to avoid contamination. Always add powder to water, never vice versa.
- If you're mixing acids or caustic with water, add the chemical to the water – never the other way round.
- Store dyes away from potential fire risks and at a temperature of 5–30°C. Some dyes have a low flash point, and others emit toxic fumes if they are burned. Write the date of purchase on the dyestuff, as some have a short lifespan.

## Project 3 Synthetic dyes



Range of reds from the yarn store of a carpet repair workshop in Izmir

This project is an introduction to synthetic dyeing and, like Project 2, it covers basic techniques. Initially you'll be making a collection of samples rather than a finished end-product. The project will take you at least 28 hours, but you may like to spend longer if you're particularly interested in dyeing. The amount of work you're able to produce will depend very much on whether you've had any previous experience of using chemical dyes. Read right through the project before deciding whether or not you want to choose this one. If you want to take longer, adjust your time accordingly.

Once you start you will need to allocate your time carefully. Be sure when you come to the dyeing process that you've given yourself enough time to complete a dye-run. If you've never used dyes before, it will be enough simply to familiarise yourself with some basic techniques. If you're not a beginner, you may like to use the project to

produce some interesting colour ranges or to try a different type of dyestuff with which you're not familiar.

Choose one of the synthetic families to work with, either fibre-reactive dyes or acid dyes.

## **Types of synthetic dyestuff**

### **Fibre-reactive dye**

Fibre-reactive dyes are used for tie-dyeing, batik and space dyeing. These dyes are both versatile and permanent. They are called reactive because they react chemically with the fibre and form a permanent bond with it. They are available in both liquid and powder form and can be used either hot or cold depending on the type of dye. Cotton and all cellulose fibres can be used with these dyes with salt and sodium carbonate (washing soda) as chemical agents. They can be used on protein fibres with salt and mild acetic acid (white vinegar). Silk can also be dyed using vinegar or soda and they will also dye rayon. They are suitable for ordinary immersion dyeing, for painting or spraying on fabric and yarn and also for screen-printing or block printing with the aid of a thickener.

Cold-water domestic dyes such as Dylon are basically cold water reactive dyes. Procion MX and Procion X, Cibracon F are brand names for cold and hot water reactive dyes.

### **Household dyes**

These are available from hardware shops and department stores. The main difference between these and other fibre-reactive dyes is the colour available. Dylon produces a range of fashion colours whereas ordinary fibre-reactive dyes are produced in basic colours like red,

yellow and blue and can be mixed very accurately with each other, like paints, to produce a huge range of colours and tones.

## Acid dyes

These are specially designed to use on wool, silk and all protein fibres. They will also dye nylon and give a brighter colour to silk than the fibre-reactive dyes. They need acid for the dye to work and heat to fix the dye. There are three main types of acid dyes – levelling, milling and metal complex dyes, all of which would be suitable to use. Acid dyes are mainly for immersion dyeing but they are also very good for ‘rainbow dyeing’ and for painting on silk or wool.

## Disperse dyes

These are the dyes used for colouring man-made fibres such as acrylic or polyester. They don’t dissolve in water but remain in particle form, so they need to be used with a dispersing agent so that the particles are evenly distributed in the water and don’t all sink to the bottom. They can be used for ordinary dyeing and printing and also for transfer printing.

## Chemicals

The various chemicals used in conjunction with synthetic dyeing are there either to help the dyes adhere to the fibre or to help the dyeing process to take place evenly. The most common chemicals used in conjunction with dyes are:

- sodium chloride (salt)
- sodium carbonate (soda, soda ash, washing soda)
- acetic acid (white vinegar)

- sodium sulphate (Glauber's salt)
- sodium acetate
- sodium hydroxide (caustic soda).

## Washing solutions

Metapex 26 or Synthrapol are specialist low temperature detergents for the washing out stages after dyeing. These help to prevent staining by removing the dye that has not been absorbed by the fabric or yarn. They're not essential for small quantities but helpful if you're dyeing larger pieces.

If you've never used chemical dyes before, some suppliers stock a basic kit, containing enough primary colours (red, blue, yellow) to dye a given weight of fabric or yarn, and you may prefer this approach (see the suppliers list in Appendix 2). If you buy a kit, follow the instructions that come with it. If you decide that dyeing is a skill that you would like to develop further, you can buy individual quantities of colours later.

## Health and safety

Remind yourself of all the safety precautions outlined earlier in this section. These safety precautions are mostly common sense and using dye is generally no different from using many other household chemicals such as bleach, oven cleaners, etc. If you're at all worried or suffer from any form of allergy make sure that you wear rubber gloves and a mask at all times. Most problems arise through prolonged use of the dyestuffs.

The following list gives a breakdown of possible hazards.

'Levelling' type **acid dyes** require the addition of acetic, formic or sulphuric acid during the dyeing process. Add the chemical to the water, never the other way round.

**Disperse dyes** may cause dermatitis as finished dye products.

**Fibre reactive (Procion or cold water) dyes** are highly dermatitic and irritate the respiratory tract if exposure is long term. They may also cause allergic and asthmatic reactions. The main danger with reactive dyes comes from airborne dusts or droplets before their application.

## STAGE 1 Preparation

Make sure that you've read the general introduction to Part Two carefully and understood the basic information given so far.

- Assemble all the equipment mentioned at the beginning of Part Two.
- Order your dyestuffs and associated chemicals (Appendix 2). Make sure that you choose the right dyes for the yarns and fabrics that you intend to dye
- Assemble a collection of materials to dye. These should include a collection of un-dyed yarns or fabric. You could also try over-dyeing coloured or patterned fabric or yarns. You might also try some more unusual materials as well – string, raffia, fleece, feathers, rags, ribbons, etc.

- Prepare your work space. Cover your working area with several layers of newspapers. Keep all your materials and equipment together.



*Dye samples, Sally Spinks,*

## STAGE 2: Using dyes

Some general guidelines and notes on dyeing procedures:

- Weigh out dry materials to be dyed (fabric or yarns). Keep a note of quantities.
- Ensure that the fabric or yarns are fully prepared (scoured and tied in skeins as described earlier).
- Think about the ratio of water to dry weight. It is important that you have enough water to allow the fabric or yarns to move easily in the dye-bath but not an excessive amount. Too much

or too little water could result in an uneven take-up of the dye. Remember to note down the quantity of water in relation to the dry weight of material.

- Make sure that yarns and fabrics have been thoroughly wetted prior to dyeing; you can do this in the dye-bath, prior to adding the dyestuffs and chemicals. Remove and squeeze out excess water back into the dye-bath.
- Always measure out the dyestuff very carefully and check that the dye powder has been thoroughly dissolved before adding to the dye-bath. Keep a note of quantities used.
- Remove yarns or fabric from the dye-bath before adding the dye solution or any acids. If you need to add more dye at any stage again, remove the yarns and fabric before doing so.
- Remember to add acid to water not the other way round.
- Make sure that the dye solution and dye assistants are properly dissolved into the dye-bath before re-immersing the cloth to avoid an uneven take-up of the dye.
- When the fabric or yarns are in the dye-bath keep them moving around with a rod or stick to promote even dyeing.
- Remember the colour will always look much darker in the dye-bath so don't be tempted to remove the fabrics or yarns too soon.
- When dyeing is complete, rinse the fabric or yarn immediately to avoid colour streaking. Make sure all the dye is removed. When dyeing wool or silk, gradually reduce the temperature of the water during rinsing so as to prevent unwanted felting or loss of lustre.
- After rinsing, if you're dealing with larger quantities, use a spin dryer to get rid of excess amounts of water; this will help to prevent colour streaking.

## Dyeing

Follow the manufacturer's instructions carefully or use the following methods as a guide. If working out weights and percentages sends you into a panic, then use the basic recipe supplied by Leslie Morgan (see below) which uses Procion Mx fibre-reactive dyes and where quantities are based on fabric length rather than weight and teaspoons are used instead of gram measurements.

## **Measurements**

When measuring out dyestuffs the depth of shade is measured as a percentage weight of dry fabric or yarn. The strongest shade is around 8% but 3-6% will generally give a good colour; therefore if you have 100g of dry weight fabric or yarn you will need 3-6g of dyestuff. A lesser percentage will give a paler colour.

To mix a dye solution, dissolve 1g of dye to 100ml of water, 2g dye to 200ml water and so on.



Dye samples, Sally Spinks

## Basic dye method for using fibre-reactive dyes (cold water)

For 100g of dry weight of fabric or yarn you will need using 6% dyestuff:

- 6g of dyestuff made up into a solution
- 60g of salt per litre of water
- 10g sodium carbonate per litre of water.

### Method

- heat the water for the dye-bath to a temperature of 30°C
- add the dye solution to dye-bath and stir thoroughly
- at 5, 10 and 15 minute intervals add equal portions of the salt, each time removing the fabric or yarn from the dye-bath