Course sample

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

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Photography 1

Digital Photographic Practice

Level HE4 – 40 CATS

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Digital photographic practice

Project and tutorial plan

Send your Student Profile straight away and speak to your tutor by phone before you start work on your course.

	Approximate time in hours

Project 1: Workflow

Exercise 1: Your own workflow – 1	6
Exercise 2: Your own workflow – 2	3
Exercise 3: Histogram	6
Exercise 4: Editing	9
Assignment 1: Workflow	**20**

Project 2: Digital image qualities

Exercise 5: Sensor linear capture	6
Exercise 6: Highlight clipping	6
Exercise 7: Your tolerance for noise	3
Exercise 8: Camera dynamic range	6
Exercise 9: Scene dynamic range	6
Exercise 10: Colour cast and white balance	6
Assignment 2: Digital image qualities	**25**

Project 3: Processing the image

Exercise 11: Raw	9
Exercise 12: Managing tone	9
Exercise 13: Managing colour	9
Exercise 14: Interpretative processing	9
Exercise 15: Black-and-white	9
Exercise 16: Strength of interpretation	6
Exercise 17: Colour into tones – 1	6
Exercise 18: Colour into tones – 2	6
Assignment 3: Monochrome	**25**

Project 4: Reality and intervention

Exercise 19: Correction	6
Exercise 20: Improvement	6
Exercise 21: Enhancement	6
Exercise 22: Addition	6
Exercise 23: Alteration	6
Assignment 4: Real or fake	**30**

Project 5: The final image

Exercise 24: Sharpening for print	6
Exercise 25: A web gallery	9
Assignment 5: Personal project	**35**

Reading and learning log time 100

Total time **400**

Digital Photographic Practice:

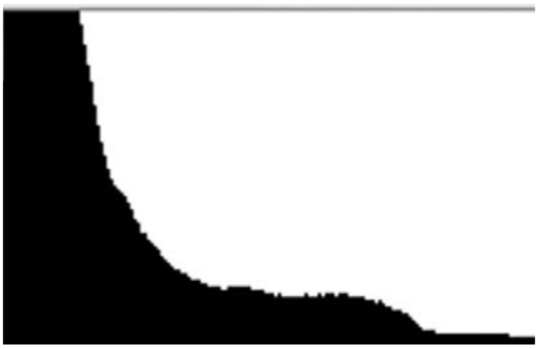
Project 2: **Digital image qualities**

Linear capture

In order to appreciate the very different way in which a sensor responds to light, as opposed to film, we need to go behind the scenes in the processing software. The camera sensor reacts to the light falling on it in a very basic way – we say 'linear'. The more light, the stronger the response, at exactly the same rate, from dark to very bright. This sounds perfectly straightforward, but it is not the way that our eyes respond. Nor is it the way in which film responds. Both eyes and film 'compress' the way they receive light in such a way that 'twice as bright', for example, seems less than it really is. This is valuable because it means that our eyesight can cope easily with a wide range of brightness. Film, to a lesser extent, does the same.

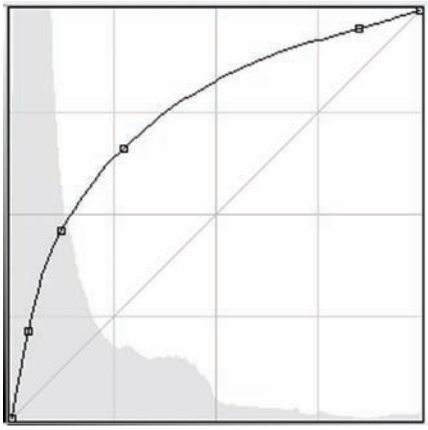
Not so a camera sensor. This may seem a strange thing to say, given that, as you take pictures, they appear exactly as you would expect them to. This is because the camera performs some quite strong processing before you get your first glimpse of the result. If we could turn off this in-camera processing, you would see that the image as first captured looks surprisingly dark.

There are indeed ways of seeing how the unprocessed, freshly captured image looks, but they are specialised, and more technical than we need to consider in this course. Briefly, though, the method is to shoot raw (see below, Exercise 11), and then process this image on the computer with a raw converter (software) that allows what is called linear processing. Very few raw converters do allow this, because it is more convenient for everyone if the processing is automatically 'natural'. We don't need to go to this extent, because it is fairly simple to simulate the effect. The image below, with its accompanying histogram, is how a raw, linear image 'looks'.



An image as captured and before processing within the camera

Like this, it appears far too dark, with most of the tonal values in the histogram squashed up against the left-hand side. But this is merely a behind-the-scenes glimpse, as the camera shows not this but a 'normalised' version. What happens is that the camera's processor applies a gamma correction curve that looks something like this, in order to bring the image to a normal appearance....



A gamma correction curve of the type needed to bring a linear-captured image to a normal appearance, and its effect on the histogram.

Gamma

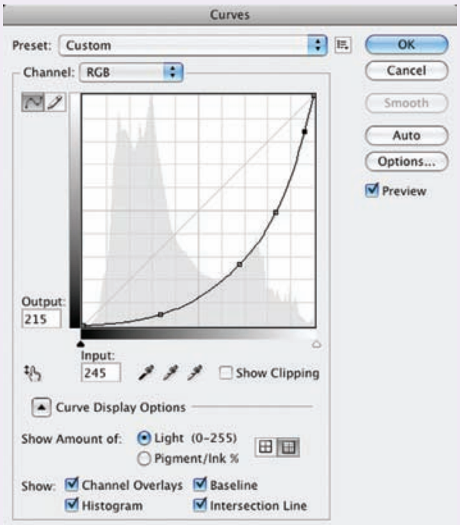
The term gamma is used often in computing and in describing digital images.

When applied to monitor screens, it is a measure of the relationship between voltage input and the brightness intensity, and because of the way a computer display works, a raw, uncorrected digital image would look darker and more contrasty than our eyes would find normal.

To compensate for this, gamma correction is applied inside the camera after capture, as the exercise will help you to understand. The typical gamma correction curve shown above has the effect of making an image brighter (because most of it is shifted to the the left) and less contrasty (because of its shape, which lifts dark tones more than light ones).

Exercise 5: **Sensor linear capture**

Rather than get highly technical, we can simulate a linear image quite simply by applying the opposite kind of curve. This will not be exact, but close enough for our purposes. Take any TIFF or JPEG image and open it in Photoshop Elements. Convert it to 16 bits per channel (Image > Mode > 16 bits) because you will be making some strong adjustments that might create some banding in regular 8-bit. Go to Image > Adjustments > Curves and make a curve that looks like the following. You will need to create several points along the curve to keep it smooth.



This is close to what the image looked like as it was captured and before the camera's processor got to work on it. Save this dark image with a different filename, and open again the original. You now have both images on the screen. Click from one to the other with the histogram open for each, and see how these two histograms differ. For the linear image, most of the tones are squashed strongly to the right. What this means is that most of the levels available to represent tones are devoted to the brightest parts of the image, while the darkest parts – the shadows – at the far left are actually represented by very few levels. This has a very important implication for noise, as we'll soon see.

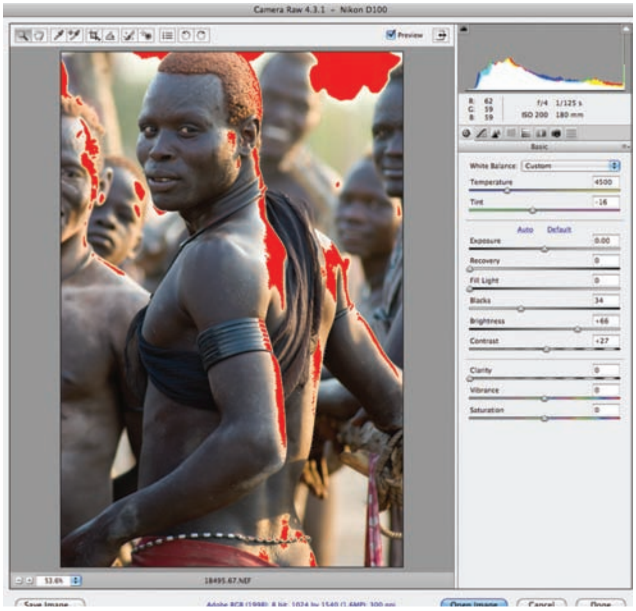
With both images side by side, go to the dark, linear one, and open the Curves dialog as before. Now create a curve that makes the image look as close as possible to the original, 'normal' looking version. It will look like the curve shown on the last page. You have just done more or less what the camera's processor does each time. Notice that the biggest effect has been on the darkest parts. They have been lightened by what looks like several stops.

If there is noise in an image, it is concentrated in the shadows, (I'll explain below). As captured, before processing in the camera, it is in a sense buried from view within the overall darkness. However, the strong curve that has to be applied to lighten the image to a normal appearance has the unfortunate side-effect of exaggerating this noise, because it lightens the shadow areas so strongly.

Note the results in your learning log.

Highlight clipping

One of the potentially unpleasant effects of this linear way in which sensors collect light is that at the brightest end there is a point at which suddenly the tones go pure, featureless white. With film it is different, because its more 'eyesight-like' behaviour means that the brightest highlights shade more gently and smoothly towards white. This is sometimes called 'roll-off'. With a digital photograph, if you over-expose part of it, you will instead notice a sudden break, as you can see in the image below.



The highlight 'break' is particularly noticeable in the sky at top left, and also on the man's back.

It looks much worse than over-exposure with film, and in almost all situations photographers try to avoid it. It is known as highlight clipping. A valuable aid to let you know when you reach the danger point in exposure, available on most good digital cameras, is a highlight clipping warning. Typically, this takes the form of a flashing area on the camera's LCD screen once you have taken a picture. If the highlight is a naked light such as the sun or a bare bulb, this will be unavoidable, but in most other picture situations, heed the warning and if possible take a second shot with a slightly darker exposure. This highlight clipping warning can be turned on or off in the camera's menu. I recommend keeping it **on**, at least for the near future.

Exercise 6: **Highlight clipping**

Find a scene which has a wide range of brightness – appears contrasty, in other words. Using either manual exposure or, if your camera has the facility, exposure adjustment with an auto setting, find the exposure setting at which the highlight clipping warning just appears. Make a note of the aperture and shutter speed. Next, increase the exposure for a second shot by one *f* stop, adjusting either the aperture or the shutter speed. This will show a wider area of highlight clipping. Then take three more shots in which you decrease the exposure each time by one *f* stop. You should then have five frames, each separated by one *f* stop.

Open the images in a browser in such a way that you can compare them side by side. (If you shot them in Raw, first process them at the default setting, without making any adjustments). For the purposes of this exercise, we can ignore all but the highlight areas, so you will probably find it helpful to make a magnified view of these highlights. What differences do you see? Specifically, make notes on the following aspects of the highlight appearance:-

- Completely lost areas of visual information
- A visible break in the form of an edge between nearly-white and total white
- A colour cast along a fringe bordering the clipped white highlight
- The colour saturation

The last point may be important for some images. Even if an image has been exposed so that there is no clipping, the colours of the highlights may still be weaker than you might want. This often happens with bright skies, particularly with bright clouds.

If you shot the images in raw, now go back to process them a second time. Most raw converters now offer a slider called Recovery or something similar. This works in a special way, making use of the fact that the three channels (RGB) do not clip at the same time. So, even though one channel may be clipped, or even two, the Recovery control uses the available information to 're-build' the clipped channel. Experiment with this slider at different strengths, and note the effect. Very strong use may introduce some strange, unrealistic effects.

Find the best compromise position according to your judgment, and save a copy of the image using this. Note the results in your learning log.