

Course Notes

Introduction Digital Photography

Introduction to the Digital Darkroom

Courses taught by Norm Bleistein and Judy Armstrong

Notes by Norm Bleistein

For the digital darkroom courses, attendees need their own computer (laptop) with digital processing software—such as PhotoShop Elements or some level of full PhotoShop, 6, 7, CS—and ability to download their own photos or come with photos on their computer on which to work.

We have new fine art photography website— PDPhotographyStudio.com — as well as a site for notecards and gifts derived from our photographs and images of other artists and photographers — PixelDitties.com. The sites are linked. There are also older images in <http://cwp.mines.edu/~norm/Photos/photoalbum.html>.

For the month of June, 2004, we also have an exhibition and sale at Framed Image in Happy Canyon Shopping Center at Dahlia and Hampden in Denver. We will have another showing at Luna Vista Imaging, 560 Sante Fe Drive, Denver.

I really enjoy the creative process and control of digital photo processing. I started out in Corel PhotoPaint 8.0, also using PhotoShop 3.0. I have upgraded to PhotoPaint 10.0 and PhotoShop CS (8.0). I prefer the versatility of PhotoShop and have not worked very much with PhotoPaint 10.0.

At the moment, we use three Olympus cameras: an Olympus E20N which is a 5 Mega pixel (Mp)—that's 5 million pixels—camera. The other two are Olympus 8080 cameras, with 8Mp images. None of these are professional level cameras; this class of cameras has inspired a new word, *prosumer*.

The E20N is a single lens reflex camera and is easier to use with the extender lenses because the viewfinder sees the image right through the lens. This can make a significant difference when composing flower photos or other close-up images where the difference between the location of the viewfinder and the lens might really matter (parallax). However, the distinction is somewhat blurred with digital cameras, because they have a preview window that displays the image through the lens. Before the 8080, I used an Olympus 5050. This is a rangefinder camera. That means that the viewing window (viewfinder in camera lingo) does not look through the lens. With that camera, I composed close-ups on the 5050 in the preview window. (There is a really nice shade that allows doing this in bright sunlight, made by screenshades.com.) Also, the preview window tilts on all these camera, making low angle pictures easier to compose. Many

cameras have features in common with these two; so describing them is a means of raising the reader's consciousness about what is available in the prosumer line.

The 8080 is the next generation of the 5050/5060 camera. The zoom range on this camera is 5X, from 28mm to 140mm in 35mm camera equivalents. The viewfinder exhibits a digital "through the lens" image, so that this is effectively a single lens reflex camera without the pentaprism and attendant longer front end of reflex cameras. We have wide-angle and telephoto attachments for all of these cameras.

If your only objective is to take snapshots to share with friends and family on the web, you do not need all of these pixels or all of the versatility of these cameras; there are cheaper options available in all of the major brands. However, these fancier cameras all can be used in no-think auto mode. So, if you are thinking about growing as a user, you certainly can start with one of these or their equivalents from other manufacturers.

We also scan photos and other images with an Epson 4870 flatbed scanner and a Nikon Coolscan 4000 slide/neg scanner. Using the flatbed scanner, we have had a lot of fun restoring old photos. At max intensity, 4000 ppi, the Coolscan provides more pixels in a scan of a 35mm negative or slide than any of the cameras mentioned above, about 24Mp.

Notes for the courses

These notes contain some technical names used in various versions of Adobe PhotoShop. The notes are by no means exhaustive, not even on the tools that are mentioned. To keep the notes brief, I have not defined the tools here. They will be defined in context in the course through demonstrations.

Opinions expressed are my own and do not reflect any official opinion by anybody! (Well, maybe Judy and her son, Kevin, get me to change my opinion occasionally...!not an easy task!)

I used Corel PhotoPaint for a long time and I was happy with the results. However, I saw Kevin using PhotoShop 6.0 and was convinced to switch! Now, there is also PhotoShop Elements 2.0, a bargain that covers a *lot* of the tools that most people need for photo processing. I have tried it and find it a great start-up program for the money. Knowing more, I find myself chomping at the bit for the tools it does not have, but nonetheless I consider it a good option for the beginner. To supplement Elements, see *The Hidden Power of Photoshop Elements 2* by Richard Lynch. The book comes with a disk of plug-ins that supplements the tools in Elements, bringing them somewhat closer to 7.0. However, the reviews on Amazon.com complain about typos and errors in the text and perhaps too high a level of communication style. One reviewer notes that the author has an errata on his web page.

Photo-shoot session.

- Use a tripod whenever possible. When you don't have a tripod and are taking telephoto shots, look for something against which to lean or wedge your camera to get the sharpest possible image. Digital imaging can give the *illusion* of sharpening the image, but that has a limited

affect on image sharpness and cannot undo an image taken with a shaking camera. When I don't want to carry the weight of a regular tripod, I am still likely to carry a tabletop tripod--very good for wedging against walls, doorposts, columns, etc, to steady the camera---or a lightweight tripod. My favorite tabletop tripod is by Leica, expensive, heavier than most, but worth it, with a small pan head--a mount that swivels, allowing the camera to be appropriately tilted for an image. (The pan head doesn't have to be Leica's.) My favorite lightweight tripod is the Cullman Jet-Set, available at <http://imagingres.com>. It is an incredible bargain!

We use our two Cullmans when we travel around the world: Germany, Italy, France, Czech Republic, China, Brazil, great in city environments and always with us when we are hiking. They are easy to take along and necessary in a lot of photo situations. At the very least, we could both be in a scene, if we wanted, by using the self-timer and the camera on the tripod.

One other device that I purchased recently, but have not yet used, is a pair of Leki expandable ski poles, the Super Extreme Poles. These contract enough to fit in carry-on luggage. The handles screw off offering two options. One is a 1/4 inch threaded screw; the other is a quarter inch threaded hole. (They are meant to be screwed together as an avalanche probe.) This is the standard size for camera mounts in the US. My pan head can mount on the screw, providing me with a monopod. The poles expand enough for classic-style cross-country skiing, but are a little small for me for skate skiing. They would also work as walking sticks. (We recently returned from Germany where I got a lot of exercise with these poles and my roller skis!)

- Using a 35mm camera as reference, for hand held pictures, I try to shoot at 1/250th of a second for focal lengths up to about 60mm and at 1/500th second up to about 200mm. Even then, I look for support on poles, fences, buildings, etc., at the higher focal lengths. Introductory books on photography often contain examples of images shot handheld at 1/30th of a second versus, say, 1/250th second. The differences speak for themselves. A great example of a handheld image, with the camera wedged against a pole is in our gallery exhibit exhibit and also on our PDPhotographyStudio site. It is called Le St. Germain. It is an image of a French sidewalk bistro taken at night, 5Mp, printed at 32X24 inches. An example of a scanned image displayed there is a picture of the Brooklyn Bridge from 1962. (I lost the negative!) The original photo is a 10X8; the new digital image is 14X11.
- Some basic rules of composition.
 - Find elements in the scene to frame your subject. Try to think about what is in the frame and not about the entire view that enticed you to take the photo in the first place. I find that I tend to look at the world in frames, always thinking about the photo that I might want to take.
 - Use elements of your field of view--horizons of the terrain, roads, trees, etc.--to point to your subject, especially when the subject is relatively small in the frame. Remember, your eye performs a subtle telephoto effect by making the object in which you are interested seem larger in your head than it really is. Of course, this is not a size-change, but a mental focusing on the interesting subject. It won't come out that way in the photo

that you take unless you think in terms of longer focal length and less of the whole scene in your image!

- Cutting off people's feet is disconcerting. If you cannot fit the entire person in the photo, then cut off just below the arms, at the waist, at the neck, etc., some logical place. Sit the subject down to compress vertically, but continue to use the same rules.
- Use something in the near foreground for wide-angle images to give some sense of scale to the far-away image. **Cautions, however!** Wide-angle lenses tend to move those lovely mountain horizons further away, making them significantly smaller in the frame than in your mental image. (When you use a wider angle setting—lower focal length—to catch the horizontal extent of a mountain, you also widen the view in the vertical, making the mountain a thin ribbon on your final image.) Concentrate on what the frame is showing you to decide if the focal length is right for the image you want.
- Use telephoto on a central part of a mountain panorama instead of trying to fit the entire panorama into one photo.
 - Understand the effect of focal length on the perspective of a mountain scene. Experiment with taking the same scene at different focal lengths. I promise that the sense of scale of the whole mountain will come through in a dramatic long focal length image that includes only a small section of the mountain. One effect of the telephoto lens will be to make the mountain look steeper than it does with the naked eye.
 - Flash fill for people in the foreground with faces not directly lit by the sun—usually better than faces in the sun.
 - Open shade is good for flowers and faces. This may require some color adjustment, but that is exactly why you are processing digitally! Also, many digital cameras have a color balance setting specifically for open shade. Faces in the shade might tend to look bluer or might take the cast of reflected light off the (green) grass or the (pink!?) wall, or whatever. Try to be aware of such changes.
 - Learn something about depth-of-field (depth-of-focus) to understand what will be sharp, what will not. Use this knowledge creatively.
 - Fun technique made easy in the digital darkroom. Take overlapping images that are later *stitched* together using a program such as **PhotoStitch** available from Canon customer service or **Photomerge** in PhotoShop CS.
 - There are many other photo-stitching programs out there. Remember to use the same exposure on the images to be stitched. Some cameras allow the user to lock the exposure. However, I never remember how to do that. So, I take readings on all the images of the panorama, average them and then set my camera to manual mode so that I can program in exactly the exposure I want.

Look at the web pages mentioned in the introduction, especially in the Photo Album site, for some examples. One of those images was a stitch of three photos taken vertically rather than horizontally. More recently, I stitched six images to create a photo of Crested Butte High School with the mountains behind. It was done on film; the negatives were digitally scanned. The final image was 163Mb in PhotoShop format. A print at 7X18 inches is extremely sharp. There are enough pixels to more than double those dimensions and still obtain a sharp image. The resulting image brought in the mountain background because they were all shot

with a 105mm lens. The alternative single image with a 24mm lens would have had a thin, almost unnoticeable mountain background. I prefer the stitched shot.

On PDPhotographystudio.com, there is an image of a “hundred foot long lying Buddha” in the travelogue on Dazu. That one is a composite of four images.

I have also used this technique in close-up situations, but there is more distortion in such images without a great deal of care. Experiment!

- Use bracketing of focal point on images with tough depth of field challenges. Focus on the flower, then the wall behind, maybe the mountain behind that! Then, combine digitally, using the sharpest of each in the final image!
- Know what you can do on the computer.
 - Change color balance.
 - Change the luminosity of the image, from deepest black to whitest white. Increase the contrast.
 - Some image degradation can occur with all of these. Severely underexposed photos, for example, will come up grainier and noisier (lots of small spots of color variation) when lightened. The bottom line is that you are still better off taking the picture at the right exposure, but when the correction is not extreme, the digital darkroom will work fine.
 - Saturate colors selectively.
 - Remove overhead wires with the Clone tool.
 - Remove unwanted background with the Clone tool (cars! people! poles! signs!)
 - There are many more creative possibilities in digital software. This is just a small subset of the possibilities that leave the original image in an enhanced form. I will confine the course to these types of processes as a way of limiting the course discussion. Even for these few, the best we can do in three hours is to introduce the ideas for you to then learn on your own.

Elementary Digital darkroom session—Basic Workflow

It is difficult to separate the elementary and intermediate levels in these notes, since the latter largely involves more sophisticated uses of the former plus additional tools.

- The photographic image is a store of numbers for each pixel. In 24-bit images, 8 bits are reserved for each of the colors, red, green and blue. (There are other ways of storing colors, but it is always *by the numbers!*) The 8 bits allow storage of 256 levels of each color. (That's the number of combinations of 8 ones and zeroes in a row.) You gain the most control of your image if you are willing to learn and understand the numbers and the role that they play. Without that, you will spend a lot more time experimenting with each image and not necessarily doing the best job that you can. The longer I use PhotoShop, the faster and simpler each image modification has become. For most of us, this is a foreign language to be mastered, both as words and numbers.

- First rule: use Save AS to save in the proprietary format of your photo processing software. Leave your original alone and, preferably, write to disk ASAP for safe storage. (We write everything on two disks.)
- **Do not** continually process in jpeg and repeatedly save. The reason is that there is no such thing as a lossless save in jpeg! So, every time you open a jpeg image, modify it and save it, you *lose* information. After a few saves of this sort, the loss of quality in the image will become apparent.
 - Look at the histogram. Discussion in class about what you learn.
 - Learn to use Layers. If you save your image with all of its layers, you can go back later and remove or modify an effect. You can see the changes achieved in a Layer by closing the eye of the layer in the layer palette. I will demonstrate in class.
 - Expand the range of colors and brightness using
 - Levels (7.0, 8.0, LE), Curves (7.0, 8.0) or Highlight/Shadow (7.0, 8.0). (Note: The Hidden Powers ..., mentioned above, has a Curves plug-in for LE).
 - Color balance.
 - **Don't** use the Brightness and Contrast tools. A peek at the histogram will tell you why.
 - The brightness of colors (luminosity) is measured on a scale from 0 to 255. If you use the Brightness tool, say, with a +20, to make the image look brighter, then each color's luminosity level is shifted up by 20. However, this means that all of the levels from 236 to 255 become 255! That's loss of information.
 - Contrast does something similar, this time spreading the luminosity out from the center, thereby stacking up levels of luminosity at both ends. Again, loss of information.
 - Levels or Curves will squeeze the luminosity levels in some parts of the range 0-255 while spreading them in other parts of the range---sort of like the effect of a corset. Levels provides three control points; Curves provides many more. Sometimes, Levels provides enough control, other times, you might want to use Curves. Individual colors (RGB, CMYK) can be modified with these tools as an alternative to modifying the overall luminosity, which is an average of the colors. I find that working with Curves on individual colors is a boon to balancing images for stitching.
 - Note: if, as a beginner, you want to stick to Brightness and Contrast until you get better, then do so. However, keep that original image for when you get better and want to use the more sophisticated tools.
 - Use the Clone Stamp (PhotoShop) or Clone tool (PhotoPaint), to paint out unwanted details---overhead wires, cars, people, signs, distracting elements in a photo. This tool lets you copy pixels from one area into another.
 - Learn to use the Selection tools to pick out specific regions of an image in order to modify selectively:
 - Magic Wand, various Lassos.
 - Rectangle mask, elliptical mask, etc.
 - Polygon mask.
 - Brushes on the masks themselves.

- Sharpen---use Unsharp mask. Discussion in session largely based on the chapter in Margulis in the reference list. PhotoShop: use sharpen brush for small details. NIK Sharpener is a good tool for overall sharpening. It seems to use local analysis to sharpen different section of the image differently.

Note!! Not all of these topics can be covered in the elementary digital darkroom class. Enough will be covered for the user to get started on improving his/her own images. Much of working with PhotoShop is a discovery process. The internal Help menu is of limited utility. The same is true for the book that comes with the software. There are lots of books in the list below and also tutorials on the web. Use google and search under the name of a method that you would like to learn. I recently had great success in learning about **Lens Blur** in CS by downloading two tutorials from the web. Often, these are written by the authors of PhotoShop books and are a great introduction to the writing style of the author.

Image size

- This is one of the last things I do after all of my digital processing. The size appropriate for a print is definitely *not* the size you want for mailing on the web.

If you are going to crop your image, do that before you make decisions about image size. You can also modify the perspective of an image (that "falling back" building, for example) using Image/Transform/Distort in LE, Edit/Transform/Distort otherwise. This is applied to a selection. For the entire canvas use Control/Command A to select all before beginning.

Note that most software gives you information of how large your photo would be in inches at some pre-chosen pixel density, say, 72 or 144 pixels per inch (ppi). 72 ppi might be the right ppi for the web, but not for printing. For printing, at least 200 ppi are desirable. (Although, I recently printed an image that started at 100ppi. I increased that progressively in PhotoShop to 125ppi and I was amazed at the result!) Most inkjet printers cannot exploit more than 360 ppi in the image, even when they print at 720X1440 dpi or even higher density. Printing density in dots per inch (dpi) and image density in pixels per inch (ppi) are not the same! In the better inkjets, each of those dots is actually made up of a host of micro-dots that compose all of the 16 million or so colors of 24bit images out of the three to five color cartridges plus black and maybe even an added gray.

We also use Genuine Fractals to change size of images and the Nik Sharpener as an alternative to Unsharp Mask in PhotoShop.

- **For the web.** Change image size with Resample option on. This will change the total number of pixels and the total size of the file. That's what you want to do. Typically, you want a much smaller file for the web than for printing. Web images display at 72 or 96 ppi and will interpolate images that arrive at larger

pixel density; so you might as well resize at one of these densities anyway. Assumption: your camera records an image with more than enough pixels for the web—not always true. My rules of thumb are

- 72 ppi.
- Larger dimension: about six inches, sometimes 8 inches for a panorama.

This does not mean that the image will always appear as 6 inches by something. It is the number of pixels that you end up with will fit on a typical screen, which is at least 1024 pixels wide. It will not work for smaller screens (in pixels), but it fits what is typical in a Mac, PC, most laptops.

File size, under 100K. Again, I might cheat for panoramas. On the other hand, files as small as 20K can look very good in an e-mail message and your friends on dial-ups will be grateful.

- **Caution!** Use SAVE AS option and a different name. I tend to add “web” to the file name, just before the .jpg.
- Note also that the later versions of PhotoShop have a “Save for the Web” option under the File menu. This will display three optional sizes for your image and you can vary what those sizes are. So, you can use that to find a size that fits your web size objective.
- **For printing.** Uncheck option to Resample image. That will retain all of the pixels of the original. Resizing will just squeeze the pixels into the (assumed) smaller dimensions of the print that you will make. If the new density of pixels per inch is higher than 360, try a print, but also try to resample the image down to 360 ppi or lower. Too many pixels per inch can actually lead to muddy looking colors on output because of the way the printer software interprets the pixels that it groups into one of its dots.

If you resize for a print with the Resample option off and see that there are not enough ppi for a print, what's to do? You might think that increasing the ppi above what you get this way will make for a better print: not really. The method I propose uses all of the pixels of the original image. If you increase the ppi, then your software will have to interpolate---average from the given pixels---to produce more pixels. That does not make for sharp pictures. For example, a black edge next to a white one will have a new gray interface between them. Image sharpening might help a bit. The recommendations that I have read suggest that you can increase the ppi by about 25-50%, but in 5-10% increments, and that's all. I use **Genuine Fractals** for increasing image size beyond file size recommendations. I am pleased with the results. Reviews tell me that it works well for larger files---perhaps 3Mp and above, but not for smaller files. For the latter, the previous method will probably work fine. There is some transition region in size where the two methods are comparable.

Exercise: If one of the dimensions of your original image is 20 inches at 72 ppi, then if you resize to 5 inches with resampling unchecked, the new density

will be 288 ppi: when you divide the length by four (20/5), then the same number of total pixels, squeezed into 5 inches means that the number of pixels per inch increases by the same factor of 4, and $4 \times 72 = 288$. If you do have Resample checked, the new image will also be at 72 ppi, or any other number that you enter.

- Exercise: With Resample "off" and Constrain proportion "on," choose one of the image dimensions and change it to the size that will fit your paper. The other dimension will change. Make sure that it fits the other dimension of your paper. If it is too big in the second dimension, then change the size in that direction to fit the paper size. I promise the previous dimension will now be smaller than the paper size in its direction.
- Look at the *new* ppi and see if it is dense enough to produce a good image. Even if it doesn't match my rules of thumb above, *try printing anyway*. However, for really low density, you will be able to see the individual pixels. A diagonal line will look like a staircase.

Printing

For photo printing, we use two 2200 Epson printers with 13 inch wide capacity. The inks for these printers are considered to be archival when used with high quality Epson papers, especially enhanced matte paper for longevity. There are fine archival papers from other manufacturers, as well. If you use a paper brand different from your printer brand, I recommend using one from a company specializing in paper, rather than another printer manufacturer's paper. The printer companies tend to make papers that are optimized for their own papers, which makes a lot of sense to me.

Judy will use a variety of papers for her note cards and calendars, depending on the objective. One of her clients is a water color artist and, of course, her images look best on water color papers made for ink jet printers.

A good source for Epson papers at moderate prices is atlex.com

Intermediate digital darkroom—beyond basic workflow.

Largely, this is a class in more sophisticated use of the tools of the elementary course.

- Quick mask and brushes to modify selections.
- Paint on selections to control the degree to which a follow-on tool will affect the image.
- More use of **Curves** of and selection tools to modify specific areas of an image.

PhotoShop automates the process of using the three eyedroppers in Curves to maximize the range of colors and intensities of your image from the whitest white with detail to the darkest dark with detail. It might not be your final choice, but it will provide a fairly accurate first pass that beats the more primitive Brightness and Contrast tools.

- Demonstration of photo-stitching.
- Distort for perspective control.
- Highlight/Shadow in CS.
- Using Layer opacity to mix effects.
- More on printing.

Some fun stuff.

- A great trick for adjusting color balance of a faded or color-casted image.
 - This is done in RGB mode. Display Info Palette. Use the Curves eyedropper to find a point that is dead center on the line of the total RGB display, not the individual R, G, or B Curve. Move the eyedropper around the image looking for a point with average RGB around 128. Click on that point. The color balance will shift. Clearly, there will be many points where the total RGB will be at the midpoint of the line, with a different distribution of RGB, at the different points. Each will give a different shift. Trial and error works here. Use Control/Command Z to undo and try again. Sometimes, I have had to do local color shifts to get the tones right, but the follow-on shifts tend to be minimal.
- A trick for making great black and white images from your color images.
 - Flatten the color image. Open the Channels palette and click on the arrow on the right. Slide down to Split Channels. You will now have three black and white images created from the R,G and B channels of the color image. They are clearly labeled with those letters. Shrink them by two clicks in Navigator and shrink their windows from the corner to match the image size.
 - Reopen the original image and flatten again. This time, go to Layers >New Adjustment Layer >Channel Mixer. A new panel will open. Click on Monochrome in the lower left of this panel. There is a gauge marker and percentage indicator box for each color. The starting point shows the red channel at 100%, with Green and Blue at zero%. There is also a constant, which provides an over all level of saturation. Shrink this one as well.
 - Now, use the Tile command to view all of your images arranged in a square.

The image you are seeing now is in gray scale, that is, what one would conventionally call a black and white picture. However, it is the sort of image that would have been produced on black and white film *with a red filter in front of the lens*. This type of filter diminishes the greens and blues of the original image, thereby darkening blue skies and green leaves. If you reduce the red and increase the green, the effect is similar to using a yellow filter on your black and white photograph, and so on. In

PhotoShop, then, you have a nearly continuous set of color filters for your black and white film. There is also a constant to be varied: it provides an overall density to the image, from black on one extreme to white on the other. Of course, the extremes obscure the image, but those middle ranges, plus or minus something around zero, allow further manipulation of the overall image. I also check with a histogram when I am done, to see that my image still has a range from 0 to 255. For most images, these makes for the nicest rendition. The exceptions are so-called *high key* or *low key images*, where one purposely limits that total range of densities over the entire picture.

I had a street scene in which there were pastel colors on the buildings, with greens and blues adjacent to one another. So, I opted for a degree of yellow filter, so that my green buildings appeared lighter, my blue buildings were darker--thereby separating the two buildings more clearly. Of course, my sky was still quite dramatic with the darkened blue setting off the white fluffy clouds.

Some books that we like.

Inside Adobe PhotoShop 6 (or 7, etc.), Gary Bouton, Barbara Bouton, Gary Kubicek and Mara Nathanson, New Riders.

Full of information! One of the standards that comes it with each new addition to PhotoShop.

Professional Photoshop 6 (or 7, etc.): The Classic Guide to Color Correction, Dan Margulis, Wiley.

This is a great book for more sophisticated techniques. This author makes a strong case for working in CMYK rather than RGB. At the very least, yellow is in a single channel Y in CMYK and is a combination of R and G in RGB. He gives a great explanation of the use of **unsharp mask** and makes its options meaningful. This book has a disk, but I have not had to use it yet.

Photoshop Restoration and Retouching, Katrin Eismann, Que.

This author tends to work in RGB. She clearly describes multiply blend mode to restore faded old images. Much more, of course! If you want to restore old photos, this is a great book to have on your shelf.

Classroom in a Book, Adobe.

This is Adobe's official training workbook for qualification as an Adobe expert. Once you get into PhotoShop, this isn't all that difficult. I find it to be a great reference with excellent descriptions of tools.

Real World Adobe PhotoShop, David Blatner and Bruce Fraser, Adobe.

This is beyond just retouching your images. It is great for more design applications, advertising, notecards, etc.

Start with a Scan: Janet Ashford and John Odam, Peachpit Press.

Great for the beginner in scanning.

Start with a Digital Camera: John Odam, Peachpit Press.

Same source as the one above, also very well written, very informative.

The Hiddent Power of Photoshop elements 2: Richard Lynch, Sybex Press

The book comes with a disk of plug-ins that supplement the tools in Elements, bringing them somewhat closer to 7.0. However, the reviews on Amazon.com complain about typos and errors in the text and perhaps too high a level of communication style. One reviewer notes that the author has an errata on his web page.

There are many more books. We own a *lot* of them!

Some online sites.

<http://www.PDPhotographystudio.com>

<http://www.PixelDitties.com>

<http://studio.adobe.com/expertcenter/photoshop/main.html>

<http://www.luminous-landscape.com/index.shtml>

<http://www.normankoren.com>

<http://www.computer-darkroom.com/home.htm>

<http://www.johnfielder.com>

<http://www.luminous-landscape.com/tutorials/workflow1.shtml>

<http://www.shortcourses.com/using/index.htm>

<http://studio.adobe.com/expertcenter/photoshop/main.html>

<http://www.pcphotomag.com/>

<http://wdc.ige.com>

<http://www.digitalmastery.com>

<http://photoshouser.com>