A Beginner’s Guide To Digital Photography
# Beginner’s Guide to Digital Photography

## Contents

### Introduction p. 1

### Chapter I: Fundamentals of Photography

- Brief History of Photography p. 2
- Introduction to Digital Photography p. 3
- Digital Camera p. 4
  - dSLR p. 4
  - Digital Rangefinder p. 5
    - Coincident Rangefinder p. 5
- Digital Point and Shoot p. 6
- Advantages and Disadvantages of Digital Photography
  - Advantages of Digital Photography p. 7
  - Disadvantages of Digital Photography p. 9

### Chapter II: The Camera - Components and Concepts

- Lens p. 11
- Focal Length p. 11
- Lens Types p. 12
  - Telephoto p. 13
  - Wide-Angle p. 14
- Zoom p. 14
- Prime p. 15
- Aperture p. 15
  - F-Stop p. 16
- Depth of Field p. 17
- Shutter p. 18
- Shutter Speed p. 18
- Image Sensor p. 19
  - CCD p. 20
  - CMOS p. 20
- Memory Cards p. 21

### Chapter III: Capturing an Image, Hands-on Basics

- Composition p. 24
  - Elements of Composition
    - Pattern p. 25
    - Symmetry p. 26
    - Texture p. 27
    - Depth of Field p. 28
    - Lines p. 29
  - Law of Thirds p. 30
  - Camera Shake p. 31
  - Red-Eye p. 32
  - Lighting p. 32
    - Under Exposure p. 32
    - Over Exposure p. 32
  - Digital Noise p. 34

### Chapter IV: Exposure Modes

- Automatic Mode p. 36
- Manual Mode p. 36
- Program Mode p. 36
- Aperture Mode p. 36
- Shutter Mode p. 37
- Scene Mode p. 37

### External Flash p. 21
- File Types p. 22
  - RAW p. 22
  - JPEG p. 22
  - TIFF p. 23

---

- External Flash p. 21
- File Types p. 22
  - RAW p. 22
  - JPEG p. 22
  - TIFF p. 23
Chapter V: General Tips in Digital Photography

Lighting p. 39
Importance of Natural Light p. 39
Best Time of Day to Take Photos p. 40
Disable Flash Indoors p. 41
Disable Flash in Low Light p. 42
Use Flash to Balance Bright Light p. 43
Get Closer to the Subject p. 44
Crop Your Photo p. 45
Choose Better Backgrounds p. 46
Pick Proper Orientation p. 47
Use Point of View p. 47
Frame your Subject p. 48
Experiment with Abstract Photography p. 49
Holding your DSLR p. 50

Chapter VI: Post Production

The Digital Workflow p. 51
   Step 1 Capturing the Image p. 52
   Step 2 Storing the Photo p. 52
       Color Depth p. 54
   Step 3 Cataloging the Image Files p. 55
   Step 4 Editing the Photo p. 56
   Step 5 Sharing p. 57
   Step 6 Archiving and Backing Up the Photograph p. 57

Wrapping Up p. 58

References p. 59
Introduction

If you enjoy traditional photography and are still fairly new to digital media, this section is for you. In this ebook you will find basic information about the types, components, and concepts as well as the pros and cons of using your digital camera.

People take photos for numerous reasons. Some take pictures for scientific reason while others shoot to document the events of the world. Some take pictures for a live advertising and many do it for sheer enjoyment and artistry.

This chapter covers:

Brief History of Photography (p. 2)

Introduction to Digital Photography (p. 3)

Digital Cameras (p. 4)

Advantages and Disadvantages of Digital Photography (p. 7)
Brief History of Photography

Long before photography was discovered, artist used a camera’s dark chamber or obscuras in Italian. Light would enter the chamber through a small opening called a pinhole and the light would then project an image of the scene onto the opposite wall. At first, large rooms were specially designed to exhibit this “magical” phenomenon; but in the 16th century, Italian artists compressed the size of the chamber to a portable box, replaced the pinhole with a lens, added a mirror to invert the image, and a translucent glass panel to display it. They manually traced the projected image by hand. Henry Fox Talbot as well as others had the idea to capture and reproduce the image directly and this led to the birth of photography. Despite the drastic changes in technology over the years, the dark box and the lens still form the foundation of modern photography.
Introduction to Digital Photography

Traditional film photography uses a chemical process to expose and capture images. The camera lens and body allow a prescribed amount of light to come into contact with the film, which is basically a sheet of plastic that has been coated with a light sensitive chemical compound. Once the film is sufficiently exposed to light an invisible picture is formed. When the film is developed, other chemicals are applied and the image then becomes perceptible forming a negative image which then can be enlarged and printed on photographic paper.

In digital photography the film is replaced with a light sensitive electronic device known as an image sensor. These sensors are made up of millions of photoelectric devices that convert light into an electrical signal. The two most common types of image sensors used in digital cameras are CCD (charge coupled device) and CMOS (complementary metal-oxide-semiconductor) sensors.

The strength of the electrical signal depends upon the amount of the light that exposes the image sensor. These electrical signals are then processed through a series of complex electronic circuits and finally stored in some type of internal or external flash memory in a standard image file format such as a JPEG file. (JPEG = Joint Photographic Experts Group). When processed by a computer, these files produce an image which is able to be printed on photographic paper.

Just as camera film is available in different sizes so are digital image sensors. The smaller sensors found in cell phone cameras and small point and shoot cameras generally produces lower quality images than a larger sensor that would be found in a digital single lens reflex (SLR) camera.
Digital Camera

In its most basic form, a digital camera is a photographic device consisting of a lightproof box with a lens at one end, and a digital image sensor at the other in place of the traditional film plane. Advances in digital photography are fast providing a wide spectrum of features and options that can be challenging for the new digital photographer to master.

There are two basic types of digital cameras: digital single-lens reflex (DSLR) and digital rangefinder.

Digital Single-Lens Reflex (DSLR)

This camera is named for the reflexing mirror that allows you to frame the image through the lens prior to capturing the image. As light passes through the DSLR camera’s lens, it falls onto a reflexing mirror and then passes through a prism to the viewfinder. The viewfinder image corresponds to the actual image area. When the picture is taken the mirror reflexes, moves up and out of the way, allowing the open shutter to expose the digital image sensor, which captures the image. Most features on a DSLR are adjustable, allowing for greater control over the captured image. Most DSLR cameras also allow the use of interchangeable lenses, meaning you can swap lenses of different focal lengths on the same camera body.
Digital Rangefinder

There are two classes of digital rangefinder cameras: coincident rangefinder and point-and-shoot.

Coincident Rangefinder

Unlike DSLR cameras, the coincident rangefinder does not offer the photographer with the capability to view the subject through the lens.

Instead, the coincident rangefinder employs a mirror or prism that uses triangulation to join the images seen through the viewfinder and a secondary window to bring the subject into focus. The photographer sees two images; one on top of the other in the viewfinder. The image is not in focus until there is a single image. When using the DSLRs, most features in a coincident rangefinder are changeable. This allows for maximum control over the captured image. An advantage of using a coincident rangefinder over a DSLR is that the absence of a rotating, or reflexing, mirror significantly reduces camera shake. Camera shake is due to unstable hand movement or the vibration of the rotating mirror found in a DSLR, and can cause blurring of the image.
Digital Point-and-Shoot

This is a lightweight digital camera, appropriately named after the two steps required for the photographer to capture an image. Basically, point-and-shoot cameras require pointing the camera and taking the picture without manually adjusting settings such as the aperture, shutter speed, focus, and other settings that professional photographers usually set on more sophisticated cameras. Of course, some point-and-shoot digital cameras do include flexible aperture and shutter settings. Point-and-shoot digital cameras are normally light and small, have built-in automatic flash, require no adjusting of focus, and most often include an LCD display that allows you to view the image through the lens in real time via the digital image sensor. Most manufacturers of point-and-shoot cameras separate the viewfinder from the lens assembly to simplify the mechanism and achieve a compact size. The lens, aperture, and shutter are one assembly, permanently fixed from the camera itself.

Because rangefinder cameras separate the optical path between the viewfinder and the lens assembly, optical compression and frame indicators (guidelines) are used to approximate the image’s frame. This approximation often causes subtle differences between what the photographer sees in the viewfinder and what is captured in the image. This is especially noticeable when the subject is close to the camera.
Advantages and Disadvantages of Digital Photography

Why precisely are digital cameras so popular today? Is there some sort of rocket science involved, which makes digital cameras superior over roll film cameras? Are they really a “good thing” to all enthusiast or they do have some drawbacks too? Let us look at some of the advantages and disadvantages of digital cameras with respect to photography.

Advantages of Digital Photography

First, the good news- There are several advantages of digital photography and they are appropriate to everyone from amateur photographers to professional photographers. Here’s why:

- **Eliminates Film and Film Processing**: This is probably the most significant of all its advantages. You do not have to spend your time and energy in developing the roll of film in a dark room. Using a digital camera, means that you can take pictures without paying for film or wondering which type of film to buy, in fact, you will never have to buy film again.

- **Large Photo Storage**: Digital cameras can easily store up to 10,000 photos, depending on the size of the memory card and the quality of pictures you are taking. This completely outweighs the storage capacity of traditional roll film cameras.

- **Operating Speed**: In case of earlier cameras, one always had to “wind” the film after clicking a photograph. This led to a certain amount of
time delay and inconvenience to the user. With digital cameras, no such activity is required. You simply point and shoot.

- **Face Detection** - High-end digital cameras have been thoroughly designed for face detection through the camera lens. Minimizing the instances of getting all those blurry faces and red-eye photographs!

- **Motion Detection** - These days, high-end digital cameras also come equipped with inbuilt motion detection features which adjust moving images and thus, avoiding blurriness. This becomes particularly helpful when taking pictures of moving objects; like a car race or a soccer game in progress.

- **Night Modes** - Taking pictures in dark or dim-lit surroundings has become much easier, thanks to special night mode features that are usually available in today’s digital cameras.

- **Easy Image Editing** - Digital images can be edited with ease. Image editing software are easily and widely available and they allow you to tweak the photograph as per your preference.

- **Viewfinder and Preview Screens** - Digital cameras have viewing screens on the camera body which allow you to view the image as soon as you have clicked it. If you do not like it, you can simply delete it giving you back the storage space intended for better shots.

- **Video Recording Capability** - Today, most digital cameras come fully equipped with built-in video recording features. So if you come across something that you would prefer to record rather than to click, you can simply do it using the same camera.

- **Get Green** - It is environmentally sound. No processing chemicals to wash down sewers. The massive amount of water and electricity used to process film are no longer needed. Also, you won’t need to worry about recycling those little plastic film containers.

- **Wiser Choice** - Digital cameras are extremely cost-effective, adaptable, and offer total VFM (value for money). Besides, they are
CHAPTER I
Fundamentals of Photography

continuously being upgraded with new features, thanks to constant technological advances.

Disadvantages of Digital Photography

Now, the bad news- There are some downsides to digital photography. It is not yet perfect and we are all still paying for the manufacturers' research and development costs. Here are some of the cons:

- **Memory Card Problems**- All the photographs, video clips, etc., are stored on a memory card. In certain rare cases, the memory card can become corrupt or can develop other issues which can result in permanent loss of data.

- **Higher Initial Cost**- High-end, fully-loaded digital cameras tend to be a little bit pricey as compared to roll film cameras.

- **Battery Consumption**- Battery consumption depletes more quickly in digital cameras. This makes it necessary to keep a few extra batteries in hand, especially during extensive photo sessions.

- **Image Resolution**- 35mm film has an image resolution that is roughly equivalent to a 25 megapixel full frame sensor. While digital image sensors continue to improve and digital cameras get better every day in general, film images still wins when it comes to resolution and quality.

- **Range**- Film has a higher superior dynamic range than digital cameras. This means that film can capture a wider range of tonal quality. This is a huge factor in overall image quality because it means it is harder to overexpose an image using film. Film typically can produce different shades of white which helps prevent overexposure of highlights. This means that film has the advantage when it comes to capturing shades of light especially at sunrise or sunset.

- **Shutter lag**- Digital cameras, especially the less expensive models are prone to have shutter lag which is the delay in time from when you press the shutter button and the time the image is captured.
Multiple Exposures - It is difficult if not impossible to do double or multiple exposures on a digital camera. Plus digital cameras are more prone to noise on really long exposures.

The Camera - Components and Concepts

In this chapter you will find the basic components of a Digital SLR Camera.

- Lens (p. 11)
- Aperture (p. 15)
- Shutter (p. 18)
- Digital image sensor (p. 19)
- Memory cards (p. 24), External flash (p. 21)
CHAPTER II
The Camera Components and Concepts

Lens

The lens is a sequence of complicated elements mostly made of glass, built to deflect and focus the light from the subject to the image sensor of a digital camera.

Aside from composing the image through your viewfinder, the first contact you have with the light from your subject is through the lens of your camera.

Focal Length

This is defined as the distance of the image sensor from the camera lens that converges light. This distance determines the magnification capability of the lens when focusing on a scene. The longer the focal length your
camera has, the more it can magnify the subject.

An example of how lens choice affects angle of view. The photos above were taken by a 35 mm camera at a constant distance from the subject.

**Lens Types**

There are several kinds of lenses available to the market but the most basic of these lenses are Telephoto, Wide Angle, Zoom and Prime. They perform the same basic function of the lens: to reflect light from the subject and projects it to the image sensor of the camera or the film. The difference among them is the way they transmit and refract light to the image sensor.
Telephoto lenses are used to significantly magnify a subject at great distances. A telephoto lens has a long focal distance, meaning that objects closer to the camera will appear slightly out of focus but objects at long range will be clear and precise.

Typically used by photographers with an interest in sports, nature and landscapes, telephoto lenses allow the photographer to get the shot they want without having to be anywhere near the “action”. Although the area of coverage is limited with a telephoto lens, it allows photographers to “zoom in” on the subject they desire.

Higher aperture settings allow the photographer to “zoom” into the background, middle regions and even the foreground, allowing for the sharper image shot they really want. However, using a smaller aperture allows the photographer to combine the three focal lengths to provide a photograph with a more “human eye” quality, combining in sharp contrast, all areas leading up to the main object.
Wide-Angle

Wide-angle lenses use only a short focal length allowing photographers to concentrate the shot on the main subject but while still get the surrounding area in focus as well. The image plane is larger than the focal length with traditional wide-angle lenses, but modern digital cameras have changed that notion. Lens multiplying factors provided by image sensors on modern DSLRs vary, so you should check the specifications on your camera. For instance, if your camera carries a 28mm sensor you will need a lens with a focal length of 28mm or less if you truly want that “wide-angle’ shot to come out right.

Zoom

A zoom lens is the type of lens which possesses the mechanical ability to alter its focal length. It is also known as an optical zoom lens. Zoom lenses can provide variable focal lengths to the photographer, making it a productive professional tool. It can alter its focal length from wide angle to standard and from there to zoom. The zoom lenses are helpful for the photographers as they do not need to hold and alter multiple lenses while working on a project or shooting. The zoom lenses always need extra glass elements to precisely focus light at variable focal lengths. The manufacturers must keep in mind that to achieve an image of best quality, light should pass through the least number of glass elements. It should also be noted that the f-stops might not always be absolutely precise due to the movement between the focal lengths. To encounter this, a lot of manufacturers provide several
minimum aperture values when the lens moves from shorter to longer focal lengths. This certainly helps to attain a higher level of precision with apertures as it makes a lens slower at longer focal lengths.

Understanding Digital Zoom
The digital zoom feature offered by some camera models does not really zoom in closer to the subject. Digital zoom crops into the center area of the captured frame, effectively enlarging the pixels. This results in a picture with a lower overall image quality. If you don’t have a telephoto or optical zoom lens and you want a close-up, physically move closer to the subject, if you can.

Prime

The focal length of a *prime lens* is unalterable. It is also termed as a *fixed lens* due to this characteristic. Prime lenses are generally manufactured with wider maximum apertures and the lens speed is faster as a result of that. In darker conditions, wider apertures really come in handy as they can provide brighter pictures. Besides, one possesses more control over the depth of field while he/she is using the wider apertures. Portrait photographers are the main users of the prime lenses.

Aperture

The opening in the lens that permits light to pass through is called *aperture*. The *aperture* is the opening formed by a system of metal leaves in the lens that open up and close down to control the volume of light passing through the lens. It is the lens's equivalent of the iris of our eye. The combination of the opening of aperture and the shutter speed determines the exposure of the image or photo. More light will pass through the lens with higher or wider aperture, which is measured by f-stops, and each f-stop represent the amount of light admitted from the lens.
If we look on a camera specification it says:

Lens: 35-105mm f-3.5-f8

The "f-3.5-f8" is called the F-stop or the maximum aperture of the lens. This figure is derived from dividing the focal length of the lens by the aperture opening of the lens.

A larger aperture size is represented with smaller number hence f2.8 is larger f-stop than f5.6. The standardized F-stop number runs as follows: f1.4, f2, f2.8, f4, f5.6, f8, f11, f16, f22, f32, f45, f64.

Each number admits half the light to the previous F-stop.

Understanding Lens Speed
A lens's speed is determined by the maximum amount of light the lens is capable of transmitting—the largest f-stop value. When a lens is capable of transmitting more light than other lenses of the same focal length, that lens is referred to as fast. Fast lenses allow photographers to shoot at higher shutter speeds in low-light conditions. For example, lenses with maximum f-stop values between 1.0 and 2.8 are considered fast.
Depth of Field

Depth of Field (DoF) is the distance between the nearest and farthest objects that appear in acceptably sharp focus in a photograph and is determined by a combination of the opening of the aperture and the focal length of the lens. A small aperture setting results in greater depth of field.

Controlling depth of field is one of the earliest ways of a photographer to compose an image. By limiting the depth of field of the subject, the photographer can turn the attention of the viewer on the subject in focus. Usually, restraining the depth of field of an image helps eliminate confusion in the background. Conversely, when shooting a landscape, you would like the image to have greater depth of field. Limiting the depth of field to the foreground would not make viable sense to a landscape or panoramic image.
Telephoto lenses (with long focal lengths) tend to have shallow focus when the aperture is opened all the way, limiting the depth of field of an image. Wide-angle lenses (with short focal lengths) tend to create images with great depth of field regardless of the aperture setting.

**Shutter**

The shutter is a device that allows light to pass for a determined period of time, for the purpose of exposing photographic film or a light-sensitive electronic sensor to light to capture a permanent image of a scene.

**Shutter Speed**

Shutter speed refers to the length of time the shutter is open or the activation of the digital image sensor. The exposure of the photo is produced entirely by the combination of shutter speed and the aperture. Shutter speeds are shown as fractions of a second, such as 1/8 or 1/250. Shutter speed increments are comparable to aperture settings, as each incremental setting either halves or doubles the time of the previous setup. For example, 1/60 of a second is half as much exposure time as 1/30 of a second, and about twice as much as 1/125 of a second.

Photographers often use shutter speed settings to convey or freeze a motion. A moving subject, such as fast moving vehicle, tends to blur when captured with a slow shutter speed like 1/8. On the other hand, a fast shutter speed, such as 1/1000, appears to freeze the movements of falling rain or snow.

**Using Reciprocity to Compose Your Image**

You can adjust the aperture setting and shutter speed to create several different correctly exposed images. The relationship between the aperture and shutter is known as reciprocity. Reciprocity gives the photographer control over the depth of field of the image, which controls the area of the image that remains in focus. This is the easiest way to control what part of the image you want the viewer to pay attention to.

For example, opening the lens aperture by one stop and decreasing the shutter speed by one stop results in the same exposure. Closing the aperture by one stop and increasing the shutter speed by one stop achieves the same exposure as well. Therefore, f/4 at 1/90 of a second is equal to f/5.6 at 1/45 of a second. The reason is that the camera's aperture setting and shutter speed combine to create the correct exposure of an image.
Image Sensors

There are two kinds of digital image sensors generally used: a charge-coupled device (CCD) and a complementary metal oxide semiconductor (CMOS).

Figure on left basically shows the method of digitizing the image or photo. Figure on right are examples of Digital Image Sensors found on Digital Cameras.

Bayer Pattern. A Bayer filter mosaic is a color filter array (CFA) for arranging RGB color filters on a square grid of photo-sensors. Its particular arrangement of color filters is used in most single-chip digital image sensors used in digital cameras, camcorders, and scanners to create a color image. The filter pattern is 50% green, 25% red and 25% blue, hence is also called RGBG, GRGB, or RGGB. It is named after its inventor, Bryce E. Bayer of Eastman Kodak.
Charged-Coupled Device - CCD

CCD sensors were initially developed for video cameras. CCD sensors record the image pixel by pixel and row by row. The voltage information from each element in the row is passed on prior to descending to the next row and only one row is active at a time. It does not convert the voltage information into digital but to accomplish the feat, another circuitry is added to the camera to digitize the voltage information prior to transferring the data to the storage medium like SD Cards.

Complementary Metal Oxide Semiconductor - CMOS

CMOS sensors are capable of recording the entire image provided by the light-sensitive elements in parallel all at once, resulting in a higher rate of data transfer to the storage medium. Additional circuitry is added to each individual element to convert the voltage information to digital data. A small colored micro lens is fixed on each element to increase its ability to read the color of light. Advances have been made in recent years in the sensitivity and speed of CMOS sensors, making them the most common type of digital image sensor found in most Digital Cameras.
CHAPTER II
The Camera Components and Concepts

Memory Cards

After the digital image sensor has processed the image, the camera will undergo a series of adjustments to optimize the image. Many of these adjustments are based on shooting settings customized by the photographer before taking the shot, such as the ISO setting. After image processing, the camera stores the digital information in a file, which varies depending on the camera’s manufacturer. However, the camera’s RAW file contains the digital image data before it has been converted to a common standardized file type, such as JPEG or TIFF.

External Flash

There are certain photographic situations that need the additional light provided by an external flash. Many consumer DSLR models have built-in flashes but the proximity to the lens and the lack of flash exposure control prevent their use in advanced situations. External flashes provide professional-level control over flash exposure. This allows for fine-tuned fill flash (low-intensity flash that illuminates the subject against a bright background so the subject does not appear in silhouette) and the prevention of overexposed subjects in close-quarter situations.
Understanding File Types

It’s important to understand the differences between image file types. RAW, JPEG, and TIFF file types are described below.

RAW

A camera’s RAW file is an unconverted, bit-for-bit digital image recorded by the camera when the image is captured. Along with the pixels in the image, the RAW file also contains data about how the image was shot, such as the time of day, the exposure settings, and the camera and lens type. This information is also known as *metadata*. RAW refers to the state of the image file before it has been converted to a common format, such as JPEG or TIFF. Because most photography applications previously could not process RAW files, RAW files had to be converted before they could be used in image processing software.

Why Shoot RAW Files?

There are many reasons to capture images as RAW files rather than JPEG files. However, it’s important to note that RAW image files require additional work to achieve the color balance you’re looking for, whereas JPEG files are color-balanced by the camera for you. JPEG files are also smaller than RAW image files, requiring less storage space.

JPEG

JPEG (Joint Photographic Experts Group) is a popular image file format that lets you create highly compressed image files. The amount of compression used can be set, less compression results in a higher-quality image. When you shoot JPEG images, your camera converts the RAW image file into an 8-bit JPEG file (with 8 bits per color channel) prior to saving it to the memory card. In order to accomplish this, the camera has to compress the image, losing image data in the process. JPEG images are commonly used for online viewing.

TIFF

TIFF (Tag Image File Format) is a widely used bitmapped graphics file format capable of storing 8 or 16 bits per color channel. Like JPEG files,
TIFF files are converted from RAW files. If your camera does not have an option to shoot TIFF files, you can shoot RAW files and then convert them to TIFF files using third-party software. TIFF files can have greater bit depths than JPEG files, allowing them to retain more color information. In addition, TIFF files can use lossless compression, meaning that although the file gets a little smaller, no information is lost, thus, the end result produces greater image quality. For these reasons, printing is commonly done from TIFF files.
Capturing an Image: Hands-on Basics

The act of taking a photo looks incredibly simple. It is just point, click, done—who could get those simple steps wrong? And yet, when we look at photographs from Facebook albums of friends or on your computer’s photo library, we often see exactly how the seemingly simple photographic process can be got badly wrong. Photo subjects chopped down to the middle, offset exposures, red-eyes, blurred foreground and background, etc.

If you want to choose photography as a profession, or even a hobby, then you have to realize that there us a lot that needs to be corrected from common practice before you can actually take a quality image.

This Chapter Includes:

Composition

Composition

Photo composition is very important as it helps to set the mood for the shot and from there, it tells the story for itself. It can also bring up an emotional response from the viewer. Let the viewfinder be your eyes but keep the composition fixed on your mind while taking the shot, and from constant correct practice, composition will become part of your nature when taking the shots.
5 Basic Elements of Composition

1. Pattern

These patterns are all around us if we learn to see them, emphasizing and highlighting these patterns can lead to striking shots.
2. Symmetry

Depending upon the scene – symmetry can be something to go for – or to avoid completely.

A symmetrical shot with strong composition and a good point of interest can lead to a striking image – but without the strong point of interest it can be a little predictable.
3. Texture

Images are two dimensional thing yet with the clever use of ‘texture’ they can come alive and become almost three dimensional.

Texture particularly comes into play when light hits objects at interesting angles.
4. Depth of Field

The depth of field that you select when taking an image will drastically impact the composition of an image.

It can isolate a subject from its background and foreground (when using a shallow depth of field) or it can put the same subject in context by revealing it’s surrounds with a larger depth of field.
5. Lines

Lines can be powerful elements in an image.

They have the power to draw the eye to key focal points in a shot and to impact the ‘feel’ of an image greatly.
Law of Thirds

If you mentally divide your viewfinder in three horizontal and three vertical sections, you will get the focal points. The focal points are the areas or spots where the viewer eyes will normally drawn to when looking on a picture.

Look at the viewfinder as presented in the picture above, yellow lines marks the imaginary lines and the red dots are the focal points. The Law of Thirds is a simple technique that assure your subject are located in frames in a pleasing manner.

Below are some images that best explain the composition and the Law of Thirds. From these examples, you will have an idea on how to position your subject on your viewfinder.
Camera Shake

Keeping the camera steady is another problem that amateur photographers usually commit. A simple fact is that a camera shutter is never as fast as the human eye when it comes to capturing a scene, and if your hands are unstable when you are taking a photo, you will end up with a blurry image and miss an ‘artistic’ moment worth taking.

You can minimize or completely eliminate camera shake by using a tripod or by increasing the shutter speed to a setting higher than the focal length. For example, if you’re shooting at a focal length equivalent to 100 mm, you should set your shutter speed to 1/100 of a second or faster. The digital image sensor will save and capture the image before additional information from the passing light and lens movement can be registered.

Or by proper positioning your body while holding the camera greatly reduces camera shake and by doing so, with proper pose while taking photos, you demonstrate a high level of photography similar to professionals. (More of camera handling in Chapter 5.)
Red-eye is the phenomenon where people have glowing red eyes in photographs. This is caused by the close proximity of the flash, especially built-in flash, to the camera lens, which causes light from the subject to be reflected directly back at the camera. When it is dim, the iris of the eye enlarges to let more light in, and when the flash goes off from the camera, the light reflects on the iris causing this error. People with blue eyes are more susceptible to red-eye because they have less pigment to absorb the light. Although most digital cameras have a red-eye reduction or removal feature, one can correct the error by using photo software like Photoshop.

Lighting

Under-Exposure

One of the most common mistakes when taking a photo is that it turns out too dim. This error is known as under-exposure. This happens when the subject is indoors or when natural light is not present.

Make use of artificial light or use a fill-in flash to correct this problem. By moving the subject to the source of the light may prevent under-exposed images.

Over-Exposure

Over exposure is the direct opposite of under exposure. This means the photo is too bright that typical colors will look washed out and the
CHAPTER III
Capturing Image

highlights will be often faded or completely white. Unlike when the photo is under-exposed, correcting over-exposed photo will heavily rely on the camera you are using. Powerful flash, shutter speeds, ISO settings are some of the key features of the camera that prevent this phenomenon.

Note: Under and over exposure is not always a bad thing. Artistic shots sometimes call for under exposed or over exposed output. Examples are shown below.
Digital noise is the washed out (or polka dots) effect in photos with long exposures or high ISO settings in low-light conditions. Many photographers consider digital noise to be the digital equivalent for film grain, an effect most visible in photos under low-light situations. Although the causes are the same, the effects are slightly different. Some photographers deliberately shoot images with enhanced grain for creative effect. However, digital noise degrades the image because of the irregular bright pixels within solid colors, and lacks the artistic qualities of enlarged film texture.
Exposure Modes

It is pretty important to understand your camera’s exposure mode to get the most out of your digital camera for your photography. Although the names of these modes differ from one manufacturer to another, the basic concepts are the same. Each mode or setting will control the aperture, the shutter speed, and the ISO using various presets providing best possible results in a number of different shooting and lighting conditions.

This Chapter includes:

- Automatic Mode p. 36
- Manual Mode p. 36
- Program Mode p. 36
- Aperture Mode p. 36
- Shutter Mode p. 37
- Scene Mode p. 37
CHAPTER IV
Exposure Modes

Automatic Mode

Or sometimes called Full Auto, from the name itself, the Auto Mode will use the readings received by the camera’s built-in light meter automatically adjusting the aperture, shutter speed, and ISO settings for each shot. In this mode, the camera let the user take photo without worrying about the settings and it allows the user to concentrate on the composition of the image. The camera’s AI will auto detect the light condition and will use of flash whenever possible unless the flash is manually disabled by the user.

Manual Mode

The opposite of Automatic Mode, in this setting, the user has to manually set the aperture, the shutter speed, and the ISO setting for each shot. The need of thorough understanding of the basic principle about taking a photo is necessary for a user to produce a good exposure.

Program Mode

A combination of Automatic and Manual modes that allowed the user to select from paired aperture and shutter speeds combination that provides control about the depth of field, motion control, and exposure settings.

Aperture Mode

Also called Aperture Priority Mode, this setting allows the user to change the aperture while the camera adjusts the shutter speed accordingly. Used mostly for shooting landscape, portrait or close-up photos. Some cameras use an “A” icon instead of “Av”.
**Shutter Mode**

Also called Shutter Priority mode, this setting allows the user to change the shutter speed while the camera adjusts the aperture accordingly. Use this mode when portrayal of motion is at the most important like when covering for sports, wildlife, journalism, and action scenes. Some cameras use an "S" icon instead of "Tv".

**Scene Mode**

Scene Mode works like Automatic Mode, but each mode pulls on a library of settings intended for specific conditions.

**Portrait Mode**

Portrait sets the camera for a lower depth of field making the foreground (the subject) in sharp focus. To max out the effect, zoom in on the subject and make sure there is enough distance between the foreground and the background. Use a telephoto to easily fill the viewfinder with the subject. (Icon on the left.)

**Landscape Mode**

Landscape Mode sets the camera for the maximum depth of field, so it produces sharp foreground and background image as possible. Remember that in this mode, the camera is set to use lower shutter speed so you may want to support your camera using a tripod. This setting is best with short focal length lens, a telephoto, and usually flash is not necessarily used. (Icon on the left.)

**Close Up**

Use this mode of extreme close up shots. (Icon on the left.)

**Sports**
Ideally used in sports or taking photo of fast moving objects. Long focal length lens is the ideal choice for taking this kind of photo. Most digital cameras and DSLR have auto focus, so you can focus on the subject even when the subject is moving. The camera is set to have the maximum shutter speed as possible. (Icon on the left.)

**Twilight Mode**

Also called Night Portrait mode, it is designed for taking photos of people or other subjects when at twilight, night or dawn. In this mode, the camera is set to have the flash active and very slow shutter speed. The shutter will remain open even after the flash so you may want to support the camera or let the subject to pause for a while, about a couple of seconds, after the flash fired off. (Icon on the left.)

**Night Mode**

Also called Night Landscape mode, in this mode the camera is set to have the flash disabled and will use a very slow shutter speed to capture the image of a landscape or cityscape in the light of dawn, dusk or night. Slow shutter speed will definitely be used so you may want to support your camera with a tripod. If you plan to shoot with a foreground subject, use Twilight mode instead. (Icon on the left.)

**Black and White, Sepia**

This mode is used to capture grayscale images. In this mode, the image is given a reddish brown tone to mimic old prints.

**Panoramic**

Also called stitch-assist, this mode helps you align a series of images together forming a wide image output. (Icon on the left.)
General Tips in Digital Photography

Lighting

Lighting is one of the most important elements of any photo, and understanding the color, direction, quantity, and quality of the light you use is one of the best ways to improve your photos. This will show you how to use lighting to your advantage—and give you some helpful rules for when and when not to use your camera's flash.

The Importance of Natural Light

Photos taken using natural light (as opposed to artificial lights or flash) are more realistic and pleasing to the eye:

- Subtle textures are preserved.
- You'll get soft, diffused light and natural-looking shadows.
- Your photo subjects can open their eyes and will be "squint-free."
- Pay attention to the direction of the light. Pose your
subject to allow diffused daylight to fall on the front or side of their face and not behind (which can cause facial features to be in shadow).

The Best Time of Day to Take Photos

The "magic hours" for photographers are in the early evening or early morning.

- This is when natural light is soft and abundant.
- You escape both the harshness of the midday sunshine and the difficulties of shooting at night.
- Taking photos during these times can make a huge difference in the quality of your pictures, particularly when you are photographing people.
Your camera's flash is a powerful tool—sometimes too powerful. And it's often overused.

- As a rule, don't use your flash indoors. It mutes color and casts stark, deep shadows (especially unflattering for portraits). Any subject you photograph with your flash from a close distance will look pale and one-dimensional.
- Using flash indoors leads to red-eye, which is caused when the flash hits the back of the eye and reflects back into the camera lens.
- Sometimes red-eye is unavoidable.
Disable your flash in low light

- Low-light conditions require you to disable your flash. This is the only way you can catch all the rich color and detail of a nighttime scene. (Note that you will need a tripod to keep your camera steady for this kind of shot.)

- Of course, there are exceptions to most every rule. Although grey skies lend themselves to great midday photos, go ahead and try using your camera's flash on cloudy days. It may brighten up people's faces and make them stand out. But be sure to also take a picture without the flash, because the soft light of overcast days sometimes gives quite pleasing results by itself.
Here are some basic techniques for capturing breathtaking photos when you don't have much light to work with:

- Use a tripod. Long exposures require you to hold your camera perfectly still to avoid blurring. A tripod really helps. If you can’t get your hands on one, you can try bracing yourself against a stationary object like a tree or a wall.

- Bring in the light. Provide as much natural light as possible by opening curtains and blinds.

- Take advantage of indirect light. Use ambient lighting from lamps, overhead lights, or candles. The extra light will also help reduce red-eye.

Use your flash to balance bright light

It sounds counterintuitive, but when taking pictures on sunny days, turn your flash on. It can help bring details out of the shadows.
If the sun is overhead, using the camera's flash can lighten harsh face shadows.

If the sun is only hitting one side of your subject's face, using flash can reduce the shadow effect.

If your subject is slightly shadowed but backlit by bright sunlight, using your flash equals out the light in front of your subject with the light behind for a balanced shot.

Because your camera decides whether or not to use the flash based on the total amount of light available, on a sunny day your camera would not fire the flash if it were on automatic. That’s when you have to do the thinking for your camera and force your flash to fire.

Just like a flash can mute colors in dark conditions, the midday sun can have the same effect for photos outdoors, casting deep shadows and reducing detail. Here are some ways to take better photos in harsh sunlight:

Seek shade. Under or around trees, shrubs or buildings are the easiest places to find respite from the midday sun.

Avoid bright window light. Placing your subject in front of a bright window will leave them underexposed against the sunlight shining in.

Know your camera's flash range. For most cameras, the
maximum flash range is five to ten feet. Pictures taken beyond that range will be too dark.

- Scout your next photo shoot. If all else fails, use the sunny afternoon as a time to scout locations for your next "golden hour" shots.

Get closer to your subject

The simplest technique for getting better photos: Get closer to your subject.

Before you take the shot, ask yourself, “Can I get closer?” If the answer is yes, then you should.

Fill your camera’s frame with your subject; this adds intimacy and power to your photos, drawing the viewer in even more.

Crop your photo
You won’t always get that perfect shot to begin with. Keeping the rule-of-thirds in mind; try cropping your photo after you’ve shot it, either in your camera or with photo-editing software.

Cropping ensures that your photo has a clear focal point to draw in a viewer’s eye.

Cropping is an easy way to fix photos where the main subject is overshadowed by distracting elements and background “noise.”
Choose better photo backgrounds

Be sure the background of your photo doesn’t interfere with your subject and take attention away from the focal points.

Avoid distracting elements in the background, such as bystanders or a multi-colored wall or background.

Find a solid-color background. When you are photographing people indoors look for a solid color background. When shooting outdoors an expanse of blue sky or even a swath of green grass can better showcase your subject.

Notice patterns. While simple backgrounds are best for subjects with busy patterns, conversely, simple patterns look best set against a detailed background.
Pick the proper orientation

Your camera produces a rectangular image. This gives you two distinct orientations to work with—vertical or horizontal.

Often, your subject will lend itself to one orientation or the other. For example, a horizontal orientation is not ideal for tall objects. On the other hand, vertical orientation might not lend itself best to a wide shot.

Sometimes it’s not so obvious which orientation to choose. One sure way to know is simply to take your photo both ways and decide which looks best.

Use point of view

Break from the habit of shooting everything from eye level.

Experiment with high- and low-angle shots that show both scale and perspective. You can kneel down to capture subjects near the ground or photograph subjects above you.

Consider creating a photo display in your home that shows one subject from several different angles.
Framing is what draws the viewer’s eye to the main subject. Creative ways to frame your subject are everywhere!

Take advantage of naturally occurring “frames”—or physical structures and patterns, like a footpath or a fence.

Overhanging tree branches, a doorway, or an arch can give a picture the depth it needs to make it more than just another snapshot.

Don’t forget, you can also use the foreground elements to frame your subject.
Experiment with abstract photography

A fun way to learn more about basic photo composition is to zoom in on abstract details. The purpose is to make a work of art rather than show the object in a realistic way.

Focus on texture, perspective, and color.

Fill your frame with a fantastic pattern (like ripples in a pond, or the checkerboard of a modern glass building).

Abstract images are an ideal opportunity to experiment with black-and-white photography.
Holding your DSLR

Blur is caused by the movement of either the subject or the camera. Subject movement is something we really can't control, although adjusting the shutter speed can give us some control over how subject movement is captured. Camera movement, however, is something we can control. Holding the camera properly is the best way to avoid a blurry picture.

You need to hold the camera as steady as possible. Hold the camera's handgrip in your right hand and cradle the camera body or lens with your left. Keep your elbows propped lightly against your torso for support and place one foot half a pace ahead of the other to keep your upper body stable. This is a steadier position than holding the camera away from your face.
Chapter VI – Post Production – Digital Workflow

Capturing a photo is just the first step in a multi-level process called digital workflow. Every photographer follows a specific process or tasks in order for them to produce a printed material or photograph. It may differ from one photographer to another but these tasks includes transferring pictures from their camera; saving, cataloging, organizing, and ranking them; then editing, publishing, and archiving them. Many of these steps are provided to us by the software that comes with digital camera when we buy them. Some programs and software are available in the market that caters to one or all of the process in digital workflow. With advent of modern photography, a single program can handle all the post-production needs of an amateur or professional photographer. Examples of these programs are Apple’s Aperture and Adobe Lightroom.

The Digital Workflow
Step 1. Capturing the Image

This is step is the very basic process that includes setting up the correct parameters of your camera prior taking pictures. This step includes composing your image, checking camera (device) and environmental condition, choosing image size, adjusting color balance, exposure, depth of field, and other camera adjustments.

Step 2. Storing the Image
After capturing the image, you usually transfer them to a more stable and safer storage device like computer or other similar medium. Latest Image management software allows you to choose your saving method via online, offline, or portable storage options.

First thing you need to consider during this phase is how you want your photo to be processed. On your camera settings, you can choose whether you want your photo to be upfront jpeg format or RAW.

All of digital camera offers you to take photo as jpeg, the format mostly used for e-mail, online posting, and sharing in general. This format is low-to-medium quality. With the highest compression rate, this file formats are small and can easily be transferred through the internet and other devices like phones, laptops, etc.

RAW file, on the other hand, are mostly available on dSLRs. They do boast of the highest quality in digital file format. These files are so large that 1 raw file is roughly equivalent to 10-100 jpeg photos of the same dimension. The advantage of shooting RAW file is you have the option to further edit or enhance the photo without losing its quality. This is the file needed by professional photographers because they usually want the finest original file they can manipulate to produce the desired output.

TIFF file format are just like RAW files, like RAW, they are pretty large in size. This format is the most used by photo editors because it has a very good image quality and not as large as RAW files. TIFF is also known as lossless compression format, meaning it has all the qualities of the RAW file.
Color Depth

Understanding color depth is quite complex, to simplify the term, color depth is the number of colors that can be produced in a pixel. To calculate the number of colors that can be displayed, you raise the number 2 to the power of the number of bits used.

The table below will summarize the facts about color depth between JPEG format and RAW format.

<table>
<thead>
<tr>
<th>Name</th>
<th>Bits per color</th>
<th>Total bits</th>
<th>Formula of colors</th>
<th>Number of colors</th>
</tr>
</thead>
<tbody>
<tr>
<td>JPEG</td>
<td>8</td>
<td>24</td>
<td>$2^{24}$</td>
<td>16,777,216</td>
</tr>
<tr>
<td>RAW</td>
<td>16</td>
<td>48</td>
<td>$2^{48}$</td>
<td>281,474,976,710,656</td>
</tr>
</tbody>
</table>

These colors are not exactly displayed by monitors, screens, printers, or any other devices. But they are very important when editing and adjusting the images to attain their final form.
Step 3. Cataloging The Image Files

In this stage, it allows you to organize the file based on a number of criteria. The metadata on the image is collected and presented in a tabular format for more organize collection of data and/or images.

Commercial software allows you to organize the photos according to some criteria or factors of the image. Good examples of these are Adobe Lightroom and DeepMeta for istockphotos.
Step 4. Editing the photo

The advantage of digital photography over the traditional film photography lies in your capability to further improve the quality of the photo by editing. You may improve an image by eliminating or minimizing the flaws, adjusting its tone, contrast, brightness, and sharpness. In this stage you can manipulate the photo based on the need or purpose. You can make it smaller or bigger, crop it or introduce to some effects and special exposures.
Step 5. Sharing

In this stage, your photo can now be printed or posted (online) and basically can be distributed to everyone you wish.

Step 6. Archiving and Backing up the Photograph

One of the best advantages of digital photography over film is you can archive the photo without losing its quality. Back-up and archiving are two different things. When we use the term back up it is having a duplicate copy of what is original while archiving is storing or keeping the file in long periods. It may be practical to use an external hard drive dedicated to photos when archiving or use a dedicated online backup tool or website that offer such services.
Resources:

http://nikonusa.com/
http://silverlight.co.uk/
http://www.apple.com/
http://aggregate.org/
http://practicalphotographytips.com/
http://www.HP.com/
http://nikonians.org/
http://en.wikipedia.org/

Complete Idiot’s Guide to Digital Photography – Steve Greenberg

Complete Digital Photography Third Edition – Ben Long