

11. Basics of Photography

Synopsis

This module provides an overview of the basics of photography..

Lectures

- 11.1 Cameras
- 11.2 Aperture
- 11.3 Shutter Speed
- 11.4 Light
- 11.5 Composition
- 11.6 Creative Exercises

11.1 Cameras

Features that are common to most cameras:

- a camera body which is light-proof,
- a lens,
- a film or digital sensors to record the image.
- An aperture which can vary the area through which light enters,
- a shutter which is open for a specified time
- a viewfinder or a screen for composing the image.

Most cameras also have:

- a tripod screw at the base of the camera body
- a mechanism for focussing
- a light meter
- a connector for a flash

Cameras differ in the amount of control they give the user over the aperture, shutter and focusing.

Simple box cameras do not require any focusing. They have a fixed shutter speed and typically three different aperture settings (bright light, cloudy day, and low light). These cameras are point and shoot designed to be used by beginners. These automatic cameras give reasonably good pictures.

Professional photographers and photo-enthusiasts desire much greater control over the image making process, than what is allowed by an automated camera. One may observe that there is a difference between photo-takers and photo-makers.



Fig. 11.1.01

A Twin Lens Reflex camera (Fig. 11.1.01) has two lenses- one for viewing, the other for recording the image.



Fig. 11.1.02

An SLR (Single Lens Reflex) camera (Fig. 11.1.02) has a single lens for both viewing and recording the image. The advantage of this is the image that is recorded is exactly the image that is viewed.

Additional controls that are made available are focusing, shutter speed and aperture control. How these controls help in a better control over the image is explained later.



Fig. 11.1.03

Large format cameras (Fig. 11.1.03) are used by professional photographers for their ability to record the image on large sized films. This results in photographs that are sharper and can be enlarged greatly.

Panoramic cameras use a wide-angle lens, or a rotating lens to project an image on a curved film to create panoramas of landscapes. Digital cameras can stitch together images to create a panoramic image.

Digital cameras have revolutionized photography as they give results that can be viewed instantaneously. The ability to record several images eases exploration.

Manual and Auto Focus

Images that appear blurred are most possibly because they are out of focus. Blurring may also happen because of 'camera-shake' – which results from the camera shaking when the shutter is pressed. Camera-shake occurs at low shutter speeds.

Certain cameras have semi-automated focus that is done by pressing on the shutter lightly. Most popular cameras have an auto focus built in. Some large-format studio cameras have manual focus only.

Occasionally photographers deliberately create an out of focus blur for artistic effect.

How Cameras Focus

Focus is achieved by turning the lens elements that changes the distance between the lens and the film / sensor.

Autofocus

Autofocus is achieved through active or passive mechanisms. Active mechanisms usually use a short burst of infrared light to measure the distance by the time taken for light to be reflected back. Active systems have problems while shooting through glass surfaces.

Passive mechanisms rely on contrast of the image in the viewfinder and sometimes use image splitting prisms.

Manual Focus

Many cameras have a mechanism, by which the image becomes visibly sharper as you focus, Sometimes a 'split image' is manipulated till it 'merges' when the image is in focus.

Lens Basics

Normal Lenses and Zooms

Photographic lenses come in two main types: fixed focal length (normal lenses) and zooms. Zoom lenses allow for the focal length to be changed. On 35mm cameras a normal lens is between 40mm and 55 mm.

Focal length

The focal length of a simple lens is the distance from its centre to the sharp image it gives of a distant object.

Wide Angle Lenses

Short focal lengths give a wide angle of view and are called wide-angle lenses. In a 35mm camera, any lens of 35mm or less is a wide angle lens.

Telephoto Lenses

Those lenses with a long focal length give a narrow angle of view. Short telephoto lenses – (70-105mm) focal length for 35mm – are also called portrait lenses. Sports photographers and wildlife photographers use 200mm to 600mm lenses.

Zoom lenses

A zoom lens have a range of focal lengths – 28-105mm or 70-210mm.

Digital Cameras

Digital cameras use a silicon chip to recors the light on an array of sensors. Sensors are covered with red, green or blue filters (RGB), so that only light of that colour can reach it. The 'raw' image contains the digital values of RGB for each pixels. Cameras with higher resolutions have more pixles for greater accuracy.

Pixel Count and sensor size

Pixel counts typically vary from 2Mp to 12 Mp. A 5 or 6Mp cameras should be able to produce decent prints at up to A3 size. Popular cameras use small sensors whereas professional cameras use larger sensors.

Lens quality

Lens quality also has an important influence on the image quality - Canon, Nikon, Olympus, Konica, Minolta, Pentax, generally be relied on to produce good quality.

Viewfinder

Most digital cameras also have an LCD screen that can be used for taking pictures.

Storage / Memory cards

Most digital cameras use memory cards to store the images you take. These can be taken out of the camera and replaced by other cards.

Image Download

Digital camera images use serial cables or a USB connection to download images from the camera to the computer. Storage cards can also be read by using a card reader.

Film

A film is a celluloid strip coated with a light sensitive emulsion. The emulsion has very tiny grains of light-sensitive chemicals. When the film is exposed to light, these grains store a latent image that is developed by processing the film. Developing creates a negative or a positive image, depending on the type of the film.

Emulsions and film speed

Some emulsions are more sensitive and respond to light more easily. These are called "fast" films. They take less light than a "slow" film. Film speeds are expressed in *ISO numbers*. ISO-25 refers to a slower film than ISO-100; and ISO-100 film is slower than ISO-400. The faster the film, the larger is the grain size. Large grains give an image a "grainy" look. A slow film gives very fine (high-resolution) images.

Assignment 1

Focus and Shoot

This assignment is to get an understanding of how to hold a camera, how to focus and take a picture. Choose different subjects, focus and shoot. Keep a record of the aperture and the shutter speed.