

# 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

## 11.3 Shutter Speed

### Shutter speed

#### Shutter Speed

There is another critical element of the camera that is usually contained within the body of the camera: the *shutter*. Basically, the shutter is a mechanism that stays closed most of time. It is only open for a precisely measured amount of time, usually measured in fractions of a second, called the shutter speed (or exposure time). Most cameras have a range of shutter speeds more or less as shown below.

1 1/2 1/4 1/8 1/15 1/30 1/60 1/125 1/250 1/500 1/1000

Each speed in this series is (roughly or exactly) half that to the left, giving a halving in the amount of light reaching the film. Although the term 'stop' originally came from the camera apertures, photographers talk about this series representing 'one stop' differences.

#### Equivalent Exposures

The total amount of light that reaches the film / sensors is determined by the combination of the shutter speed and the aperture. Different combinations of shutter speed and aperture can lead to the correct amount of light falling on the film / sensors. All possible combinations of shutter speed and aperture that result in the same amount of light falling on the film / sensors, are called equivalent exposures. One may use any of these exposures to get a correctly exposed image.

Let's suppose that 1/125th of a second at f /8.0 produces an ideal exposure.

If we doubled the aperture size from f/8.0 to f /5.6 (which would let in twice as much light) and cut the exposure time in half (to 1/250th of a second), the amount of light would be the same as before. One may stop up / down and make a corresponding allowance in the shutter speed to achieve other combinations that give an equivalent exposure.

Which of the equivalent exposures is chosen, depends on the desired result? For having a control on the depth of field, we need to give priority to the aperture setting. If we need to freeze or blur an image, or simply ensure that there is no camera-shake, we need to give priority to the shutter speed setting.

if you double the aperture size and cut the exposure time by half, you get the same exposure. Or, you could stop down by a full stop (cut the aperture size by half, in our example to  $f/11$ ) and double the exposure time (in our example, to  $1/60$ th of a second) ... bingo! ... the same total amount of light, once again.

### Blur and Freeze

If all subjects were absolutely still all the time, then having the capability to vary the shutter speed would not be very important. However, most real subjects move, to a greater or lesser extent. If we want the capacity to "freeze" that motion, we need a fast shutter speed. For example, suppose you wanted to take a close-up shot of some wildflowers that were waving in a slight breeze. If your shutter speed is fast enough, say  $1/250$ th of a second, the image will appear to have "frozen" the wildflower's motions and it will be sharp and clear.

On the other hand, you might want to photograph a moving stream and have its motion turn the water into a sort of blur. This is a very common thing to want to do ... in order to do this, you would want a slow shutter speed, say  $1/2$  a second.

Therefore, the ability to vary the shutter speed is an important factor under your creative control.



Fig. 11.3.01a



Fig. 11.3.01b  
Blur caused by a low-shutter speed.



Fig. 11.3.02a



Fig. 11.3.02b  
Freezing an action by using a high shutter speed.

### Assignment 3

#### **Exploring Shutter Speed**

Freeze, Blur, Panning

The shutter speed determines the duration for which the film is exposed to light. A high shutter speed implies that light is allowed to enter for a very short time. Similarly, a low shutter speed implies that light can enter for a relatively longer duration.

This exercise is to understand how shutter speed can be used to freeze a subject, or create a blur. You would also need to take a few images where the camera has been panned in the act of clicking.

Freezing the subject can result in dramatic split-second snapshots where a very high shutter speed has to be used (1/1000 s or less).

Blurring takes place when the subject moves during the exposure. For this shutter speeds need to be relatively low (1/30s or more).

To pan the camera in a smooth arc, it might be necessary to mount it on a tripod.

#### **Please note:**

A predominantly white background would not result in the streaks that characterize the results associated with panning.

A “camera-shake” results from the camera accidentally shaking (typically for shutter speeds less than  $1/30$  s). This is not to be confused with “blur”.

1. Create an image where you have used a very high shutter speed to freeze some action / event.
2. Create a blurred image by using a low shutter speed. The blur created should accentuate the quality you seek to express.
3. Create an image in which the camera has been panned in the act of clicking.