SYLLABUS

Class – B.A. (HONS.) MASS COMMUNICATION

III Semester

Subject –Photo Journalism

Unit-I	Photo Journalism: Meaning & Definition, Growth & Development Camera: Types and parts.
Unit-II	Photography: Elements & principles Lens: different types of lenses: Normal, wide, telephoto, Zoom, Fish eye Lens and close up lens.
Unit-III	Focal length, aperture, shutter speed, depth of field, Focusing exposure. Exposure meter. Film: Nature, speed and types of film.
Unit-IV	Lighting Arrangement: Different light sources. Electronic flash, shutter synchronization, lighting principles. Composition: Basic elements of composition rule of thirds.
Unit-V	Digital Photography.

UNIT-I

INTRODUCTION

Man has always had a desire to learn and expand his knowledge. This he did by travelling to new places.

Man drew pictures of the new things he saw or wrote about his travels. Then came printing. Printing could make the written word more popular amongst people. The printed word was combined with hand drawn pictures to describe what was written. This added to the people's knowledge of things and they could visualise what was being written about. With the coming of photography news could be conveyed with greater authority and emphasis with photographs.Photographs started supporting the written news in newspapers and magazines and thus photojournalism was born.

MEANING OF PHOTOJOURNALISM

Every morning we wake up and read the newspaper. There is always a picture on the first page which shows the important news of the day. Such a picture is a result of what we know as photojournalism.

Once photography grew popular and became easy to do, it started getting specialised in its use. By this, you must understand that soon after the discovery of photography people were very excited and busy getting their photos taken. Soon they started travelling with the camera, gathering pictures of far off places and showed them to people who could not get there.

Wars were happening in the world; photographers went to such places and took pictures. Such photographers were the first war photojournalists. Still it was not possible to print these pictures on the newspaper alongside the written news.

Around the 1880s, a technology called half tone developed by which photographs could be printed in the newspapers. Photojournalism as we know today is news photography. Photographs that support the story of a news event fall in this category and photographers who specialise in this are called photojournalists.

TYPES OF PHOTOJOURNALISM

Photojournalism has grown into a very specialized form of photography and it has many more avenues. This is because news itself has many areas wherein a particular person is assigned to work in. So photographers according to their likes and dislikes have gone into specific areas. When a photographer is gifted with the ability to write in support of his photograph in a few words, he becomes a photojournalist.Let's find out the different types of photojournalism.

1)Sports photojournalism: As sports events are a big part of news, there are photojournalists who specialize in photographing sports. This is also because sports photography requires a specialised skill as well as equipment. Nowadays there are photojournalists who specialise in photographing individual sports.For example in India, there are photojournalists who are dedicated to cricket photography as it is the most popular sport and is now played throughout the year irrespective of it being day or night.

(a) Sports Journalism

(b) War Journalism

2) War photojournalism: This is the earliest form of photojournalism, where photojournalists have covered wars and sent photos from the centre of action. In India we see a lot of photographs in newspapers, of conflicts within the country such a terrorist activity or a riot where the photographer is in a dangerous situation and yet he manages to send us pictures, risking his life.

3) Glamour photojournalism: Film stars and other famous personalities have become a major part of news coverage as most people want to peep into the lives of the rich and famous. There are photojournalists who specialise in this kind of photography only are also called paparazzi, which is an Italian word.

(c) Glamour

4) Spot news photojournalism: This means covering events that make day to day news, like political events, crime, accidents etc.

(d) Spot Photo

This is in fact the most common type of photojournalism and is most demanding for a photojournalist.

5) Travel photojournalism: This type of photojournalism involves the documentation of an area's landscape, people, cultures, customs and history.

Travel photographs are taken by professionals or even amateurs. Photographs taken by amateurs are shared online with friends, relatives etc through photo sharing websites.

(e)Travel

6) Wildlife photojournalism : This is regarded as one of the more challenging forms of photojournalism. Advanced photographic equipment as well as a good knowledge of the animal's behaviour as well as the terrain is needed to take wildlife photographs.

Though these are only some of the many specialised categories of photojournalism,each newspaper has its set of photojournalists who cover all affairs that may make news around the globe.Photojournalists can be of two kinds, those who are employed by the newspaper and the others who work as freelancers i.e. those who work independently and sell the pictures that they take to newspapers and other news agencies. Photojournalism is now no longer limited to newspapers. With the emergence of the internet as a major source of news, the scope of photojournalism has extended itself into what is known as web based photo journalism. Some of you who use the internet would have seen websites that are like newspapers. These sites also employ journalists as well as photojournalists to gather news for their organisations. Now with so many people

carrying the camera in their phones, it may be of interest for you to know that newspapers and websites use photos sent by people like us to them, because we as ordinary people may be present with our mobile phone cameras at places when an incident of interest to the newspaper may take place!

COMPOSITION

Any photograph must speak for itself. This means that on seeing a photograph theperson watching it must immediately understand what it is trying to convey. There is a saying that "a single picture is worth a thousand words". This means that a picture can convey a message more convincingly than a thousand words . Youmay have seen many photographs that leave a lasting impression on you. Have you wondered why it is so? This is because the subject which is photographed is placed in the picture frame in such an intelligent manner that it leaves an impact on the viewer. This placement of the subject or subjects within the picture frame is called ***composition.***

Composition has a special meaning when it has to convey news to the public as is the case in photojournalism. It is the placement of the subject being photographed that leaves an impact on the viewer. Let us consider a situation where you have to show a photograph of a poor man. You can take a simple photo of a beggar on the
street and convey your message. But if the same photograph is taken in such a manner that the beggar is close to the camera but at a distance is also a rich man sitting in a big car. This picture will have a greater impact because its composition shows the contrast in the two people in the same picture and highlights the condition
of the beggar as against the rich man. One can think of many such instances.

Composition also deals with making the picture look more appealing to the eye. Action photographs of war or sports show a kind of energy that should make the viewer feel that he is in the midst of those actions. Composition also demands balance, that is to say a photograph must be taken in such a manner that it should not seem to make our eye wander to a corner. The various subjects should be so organised that the picture has a pleasing effect. There are some basic rules of framing, of which the ***rule of thirds*** is the most common. It states that elements in a frame must be so placed that they roughly fall on the intersection of the lines that divide the frame in three rows and three columns.This is no hard and fast rule, yet it helps in leaving a positive impact on the viewer.

Camera angle is another factor that has an impact on composition. If the person in a picture is an important person like a leader or a film personality, one composes the picture by keeping the camera below the person's eye level. When this is done the person shall appear much larger . Similarly taking a picture from above a person's height also called top angle makes the person appear small. All such methods of composition are employed to make the picture more effective in terms of what it is trying to say, so that the viewer can immediately understand its meaning.

PHOTO EDITOR

Now who is a photo editor? A ***photo editor*** is the overall in charge of the photo section in a newspaper or magazine. He chooses the photographer and discusses the topic. He may also choose a reporter who

will write the story around the photo essay. It is also the job of the photo editor to decide and select on the best pictures that convey the whole story.

ROLE OF A PHOTOJOURNALIST

A good photojournalist is both a skilled photographer who uses the camera and other equipment to his best advantage. He must also be a thinking creative person who mixes technique and judgement to capture images as they happen because news events do not wait for the photographer.

Some photojournalists attempt to make their photographs more interesting by manipulating the image (for example, by making people pose for the photograph).This is wrong as the main task of a photojournalist is to give the viewer an image that is truthful and speaks for itself. Manipulating an image is like making up a news story. It would no longer be journalism but story telling.

ETHICS AND THE PHOTOJOURNALIST

Ethics is an important word in journalism. Ethics are the moral principles that influence the conduct of people. Journalistic ethics are the moral principles that govern the practice of all forms of journalism. They guide the photojournalist in deciding what is right and what is wrong.

Truthfulness is a core journalistic ethic. A photojournalist must always strive to take pictures that tell the truth.This issue of ethics has become more important in the digital age when it is very easy to change the photograph on the computer. It is believed that the camera never lies. But now with a few clicks of a computer mouse, you can completely change a photograph. So much so that it is no longer a record of an event. For example, you can show a man to be smoking even if he has never held a cigarette in life or in the company of someone he has never met. You can show a crowd of people at a place when in fact there were only a few people present when the picture was taken. You can make people appear to be standing in front of well known monuments in foreign countries to which they have never been!

All manipulation of photographs is a violation of basic journalistic ethics. For the photojournalist must capture the truth. This means that the photojournalist must only photograph what has happened, when it happened and not invent a situation or recreate one by moving things around in the picture to make it seem more interesting than it really was. It is also against journalistic ethics to stage or create a picture by having people pose for the camera. ***For example*** if a photojournalist wants a picture of a midday meal scheme in a school he must go to a school at meal time and take pictures of what is seen. These might be of food being prepared or served to the children or the children eating their food. It would be against journalistic ethics if he were to make a group of children in school uniform sit in rows with plates in front of them and pretend to be eating a meal at school.

A photojournalist who takes his professional responsibilities seriously would never manipulate an image or stage an event for the benefit of his camera.

PHOTOJOURNALISM IN INDIA

Photography arrived in India almost within two years of its discovery. As India was being ruled by the British, British photographers started taking pictures of the country, its scenery and monuments. When the first war of Independence happened in 1857, it was one of the first incidents of war photography in the world and you may have seen some photographs in magazines.Later on when the camera became smaller, photojournalism gained greater popularity. Many political developments were also taking place in India especially around the freedom movement. All this gave a lot of chance to photojournalists to take pictures.

Raja DeenDayal was one of the first notable Indian photojournalists. He was a court photographer in India during the rule of the sixth Nizam of Hyderabad. As he was the only native photographer, he has left behind a very impressive record of British India.

Among the famous photojournalists who worked then was ***Sunil Janah***. A political activist and journalist, Sunil Janah began to photograph while writing assignments for his newspaper. At the time of India's independence, Janah photographed the significant events in the country and made a record of the transition from British rule to independent India. His photographs of India's partition,its people; specially the tribals as well as pictures of industries and temple structures are very famous. Photographs of Nehru and Gandhi by Sunil Janah are now seen by us everywhere.

There is another name which needs a special mention here, also because in a profession dominated by men, she was the first woman photojournalist. She is ***HomaiVyarawalla***. Her work was first published in 1938 in the Bombay Chronicle, and later in other major publications of those times. She also worked for the Illustrated Weekly of India and during World War II covered every aspect of wartime activities in India. Her documentation of the events of the freedom movement are significant. She remained a freelance photographer until 1970 and was highly respected amongst all photojournalists.

There are several international photojournalists who loved photographing in India. Amongst them, the name of ***Henri Cartier Bresson***is famous. Henri Cartier Bresson was French and his name is counted amongst the best photojournalists of the world. He travelled in India in the 1940s and then kept coming back here in later years. His most famous photograph is that of Pandit Jawaharlal Nehru announcing the death of Gandhiji. His book called 'Henri Cartier Bresson in India' is very well known.

Amongst the photojournalists after Independence, the name of Raghu Rai is most famous. Rai's photographs are still seen as he continues to do photography. ***Raghu Rai***started his career in photojournalism in the 1960s in Delhi and worked for important national newspapers like the Hindustan Times and Statesman. Later hebecame the Chief Photographer for 'India Today' where he worked for a long time. Now MrRai works as an independent photographer and his work is truly

respected all over the world. His photographs of famous personalities such as Indira Gandhi and Mother Teresa are very well known. Apart from this Raghu Rai
has covered all important events that have taken place in the second half of the last century such as the Bhopal gas tragedy and the Bangladesh war. He has brought out books on various subjects such as Delhi, TajMahal, Sikhs, Benaras etc. His early pictures are mostly in black and white but later he has photographed in colour.They all have a beautiful quality about them.

PrashantPanjiaris another successful photojournalist of the present times.Born in Kolkata, he is a self taught photographer who has worked for many magazines in Delhi. His most successful career was with the 'Outlook' magazine as its chief photographer and associate editor. He is a founding member of this magazine and through his photographs, he gave it a popular appeal among people and now Outlook has become a leading news magazine in India.

Mentioned above are just a few names of important photojournalists. Apart from them there have been so many who have made important contributions to the field of photojournalism by thier work in the print media all over the world. With the improvement in printing technology, newspapers have started using more photos and in colour. This has given rise to a greater demand for trained people in the field of photojournalism.

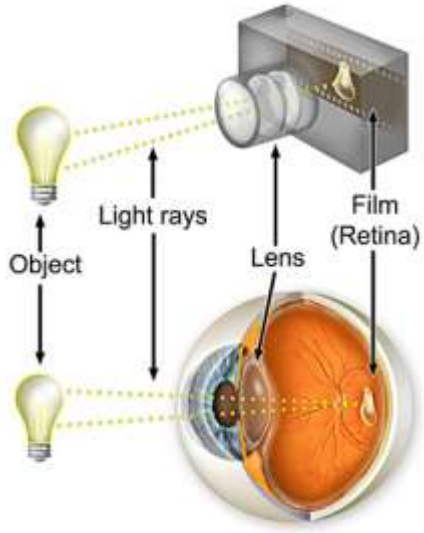
INTRODUCTION TO CAMERAS

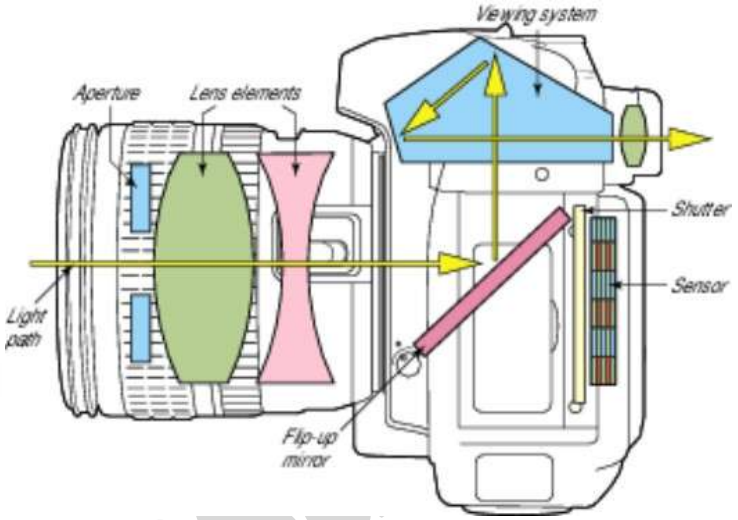
The camera contains a sensor that converts light from the lens into electrical signals. These signals are digitized into an array of values called pixels and processed by a Vision Appliance™ to perform the inspection.
The resolution (precision) of the inspection depends upon the working distance, the field-of-view (FOV), and the number of physical pixels in the camera's sensor. A standard VGA camera has 640 x 480 physical pixels (width x height), and each physical pixel is about 7.4 microns square. From these numbers, resolution can be estimated for your "real world" units. We usually specify resolution as a fraction of a physical pixel, as this is independent of your particular imaging set-up.
The sensors used by machine vision cameras are highly specialized, and hence more expensive than say, a web cam. First, it is desirable to have square physical pixels. This makes measurement calculations easier and more precise. Second, the cameras can be triggered by the machine vision system to take a picture based on the Part-in-Place signal. Third, the cameras have sophisticated exposure and fast electronic shutters that can 'freeze' the motion of most parts.
When using many of the automatic cameras today, many of the features listed below are obsolete. This list is provided for those students who are enthusiasts of the manual camera.

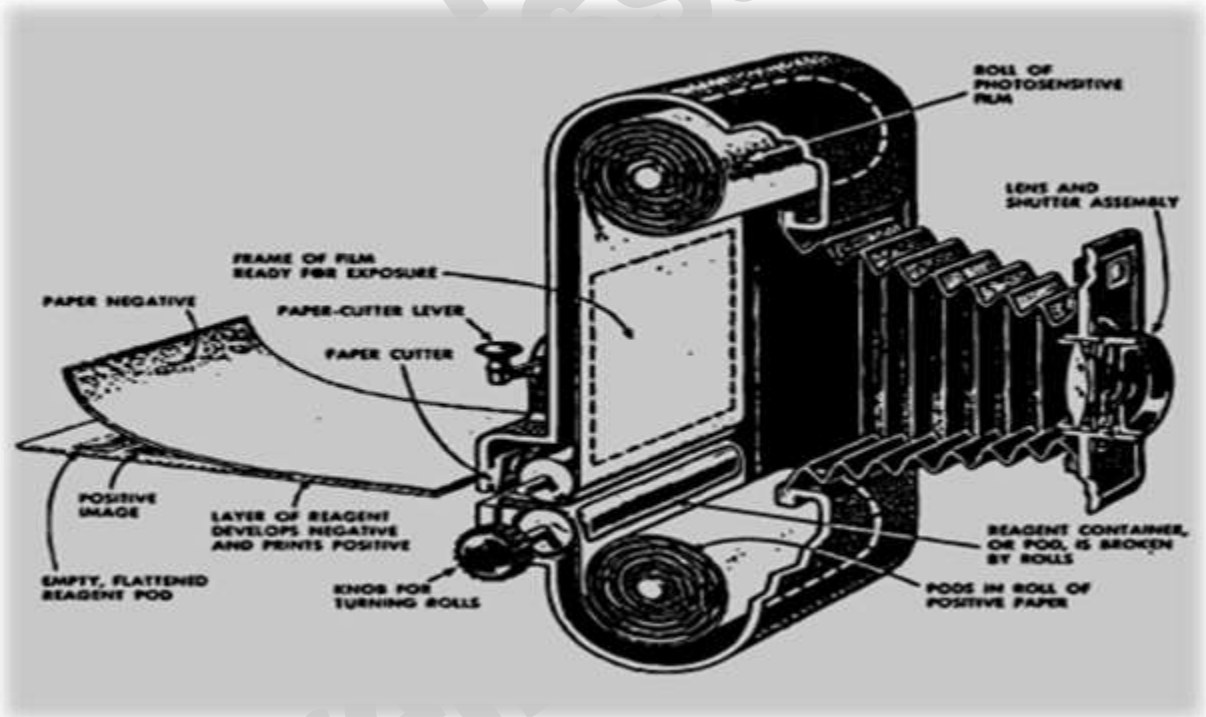
Lens - It draws the light into the camera and focuses it on the film plane.
Shutter - It open and closes to control the length of time light strikes the film. There are two types of shutters: a leaf shutter, located between or just behind the lens elements, and a focal plane shutter, located in front of the film plane.
Shutter Release - The button that releases or "trips" the shutter mechanism.
Film Advance Lever or Knob - It transports the film from one frame to the next on the roll of film.
Aperture - It dilates and contracts to control the diameter of the hole that the light passes though, to let in more or less light. It is controlled by the f-stop ring.
Viewfinder - The "window" through which you look to frame your picture.
Film Rewind Knob- This knob rewinds the film back into the film cassette.
Camera Body - The casing of the camera which holds the encloses the camera pats.
Flash Shoe - This is the point at which the flash or flash cube is mounted or attached.

Self-Timer - This mechanism trips the shutter after a short delay - usually 7 to 10 seconds - allowing everyone to be in the photograph.

Shutter Speed Control - This know controls the length of time the shutter remains open. Typical shutter speeds are measured in fractions of a second, such as: 1/30 1/60 1/125 1/250 1/500 and 1/1000 of a second.







MECHANICS

Image capture -Traditional cameras capture light onto photographic film or photographic plate. Video and digital cameras use an electronic image sensor, usually acharge coupled device (CCD) or a CMOS sensor to capture images which can be transferred or stored in a memory card or other storage inside the camera for later playback or processing.

Cameras that capture many images in sequence are known as movie cameras or as ciné cameras in Europe; those designed for single images are still cameras. However these categories overlap as still cameras are often used to capture moving images in special effects work and many modern cameras can quickly switch between still and motion recording modes. A video camera is a category of movie camera that captures images electronically (either using analog or digital technology)

Lens - The lens of a camera captures the light from the subject and brings it to a focus on the film or detector. The design and manufacture of the lens is critical to the quality of the photograph being taken. The technological revolution in camera design in the 19th century revolutionized optical glass manufacture and lens design with great benefits for modern lens manufacture in a wide range of optical instruments from reading glasses to microscopes. Pioneers included Zeiss and Leitz.

Camera lenses are made in a wide range of focal lengths. They range from extreme wide angle, wide angle, standard, medium telephoto and telephoto. Each lens is best suited a certain type of photography. The extreme wide angle may be preferred for architecture because it has the capacity to capture a wide view of a building. The normal lens, because it often has a wide aperture, is often used for street and documentary photography. The telephoto lens is useful for sports, and wildlife but it is more susceptible to camera shake.

Focus- Due to the optical properties of photographic lenses, only objects within a limited range of distances from the camera will be reproduced clearly. The process of adjusting this range is known as changing the camera's focus. There are various ways of focusing a camera accurately. The simplest cameras have fixed focus and use a small aperture and wide-angle lens to ensure that everything within a certain range of distance from the lens, usually around 3 metres (10 ft) to infinity, is in reasonable focus. Fixed focus cameras are usually inexpensive types, such as single-use cameras. The camera can also have a limited focusing range or scale-focus that is indicated on the camera body. The user will guess or calculate the distance to the subject and adjust the focus accordingly. On some cameras this is indicated by symbols (head-and-shoulders; two people standing upright; one tree; mountains).

Rangefinder cameras allow the distance to objects to be measured by means of a coupled parallax unit on top of the camera, allowing the focus to be set with accuracy. Single-lens reflex cameras allow the photographer to determine the focus and composition visually using the objective lens and a moving mirror to project the image onto a ground glass or plastic micro-prism screen. Twin-lens reflex cameras use an objective lens and a focusing lens unit (usually identical to the objective lens.) in a parallel body for composition and focusing. View cameras use a ground glass screen which is removed and replaced by either a photographic plate or a reusable holder containing sheet film before exposure. Modern cameras often offer autofocus systems to focus the camera automatically by a variety of methods.

Some experimental cameras, for example the planar Fourier capture array (PFCA), do not require focusing to allow them to take pictures. In conventional digital photography, lenses or mirrors map all of the light originating from a single point of an in-focus object to a single point at the sensor plane. Each pixel thus relates an independent piece of information about the far-away scene. In contrast, a PFCA does not have a lens or mirror, but each pixel has an idiosyncratic pair of diffraction gratings above it, allowing each pixel to likewise relate an independent piece of information (specifically, one component of the 2D Fourier transform) about the far-away scene. Together, complete scene information is captured and images can be reconstructed by computation.

Some cameras have post focusing. Post focusing means take the pictures first and then focusing later at the personal computer. The camera uses many tiny lenses on the sensor to capture light from every

angle of a scene and is called plenoptics technology. The current Plenoptic camera can serve as has 40,000 lenses working together to grab the optimal picture.

Exposure control - The size of the aperture and the brightness of the scene controls the amount of light that enters the camera during a period of time, and the shutter controls the length of time that the light hits the recording surface. Equivalent exposures can be made with a larger aperture and a faster shutter speed or a corresponding smaller aperture and with the shutter speed slowed down.

Shutters - Although a range of different shutter devices have been used during the development of the camera only two types have been widely used and remain in use today.

The Leaf shutter or more precisely the in-lens shutter is a shutter contained within the lens structure, often close to the diaphragm consisting of a number of metal leaves which are maintained under spring tension and which are opened and then closed when the shutter is released. The exposure time is determined by the interval between opening and closing. In this shutter design, the whole film frame is exposed at one time. This makes flash synchronisation much simpler as the flash only needs to fire once the shutter is fully open. Disadvantages of such shutters are their inability to reliably produce very fast shutter speeds (faster than 1/500th second or so) and the additional cost and weight of having to include a shutter mechanism for every lens.

The focal-plane shutter operates as close to the film plane as possible and consists of cloth curtains that are pulled across the film plane with a carefully determined gap between the two curtains (typically running horizontally) or consisting of a series of metal plates (typically moving vertically) just in front of the film plane. The focal-plane shutter is primarily associated with the single lens reflex type of cameras, since covering the film rather than blocking light passing through the lens allows the photographer to view through the lens at all times *except* during the exposure itself. Covering the film also facilitates removing the lens from a loaded camera (many SLRs have interchangeable lenses).

Complexities - Professional medium format SLR cameras (typically using 120/220 roll film) use a hybrid solution, since such a large focal-plane shutter would be difficult to make and/or may run slowly. A manually inserted blade known as a dark slide allows the film to be covered when changing lenses or film backs. A blind inside the camera covers the film prior to and after the exposure (but is not designed to be able to give accurately controlled exposure times) and a leaf shutter that is normally open is installed in the lens. To take a picture, the leaf shutter closes, the blind opens, the leaf shutter opens then closes again, and finally the blind closes and the leaf shutter re-opens (the last step may only occur when the shutter is re-cocked).

Using a focal-plane shutter, exposing the whole film plane can take much longer than the exposure time. The exposure time does not depend on the time taken to make the exposure over all, only on the difference between the time a specific point on the film is uncovered and then covered up again. For example an exposure of 1/1000 second may be achieved by the shutter curtains moving across the film plane in 1/50th of a second but with the two curtains only separated by 1/20th of the frame width. In fact in practice the curtains do not run at a constant speed as they would in an ideal design, obtaining an even exposure time depends mainly on being able to make the two curtains accelerate in a similar manner.

When photographing rapidly moving objects, the use of a focal-plane shutter can produce some unexpected effects, since the film closest to the start position of the curtains is exposed earlier than the film closest to the end position. Typically this can result in a moving object leaving a slanting image. The direction of the slant depends on the direction the shutter curtains run in (noting also that as in all cameras the image is inverted and reversed by the lens, i.e. "top-left" is at the bottom right of the sensor as seen by a photographer behind the camera).

Focal-plane shutters are also difficult to synchronise with flash bulbs and electronic flash and it is often only possible to use flash at shutter speeds where the curtain that opens to reveal the film completes its run and the film is fully uncovered, before the second curtain starts to travel and cover it up again.

Typically 35mm film SLRs could sync flash at only up to 1/60th second if the camera has horizontal run cloth curtains, and 1/125th if using a vertical run metal shutter.

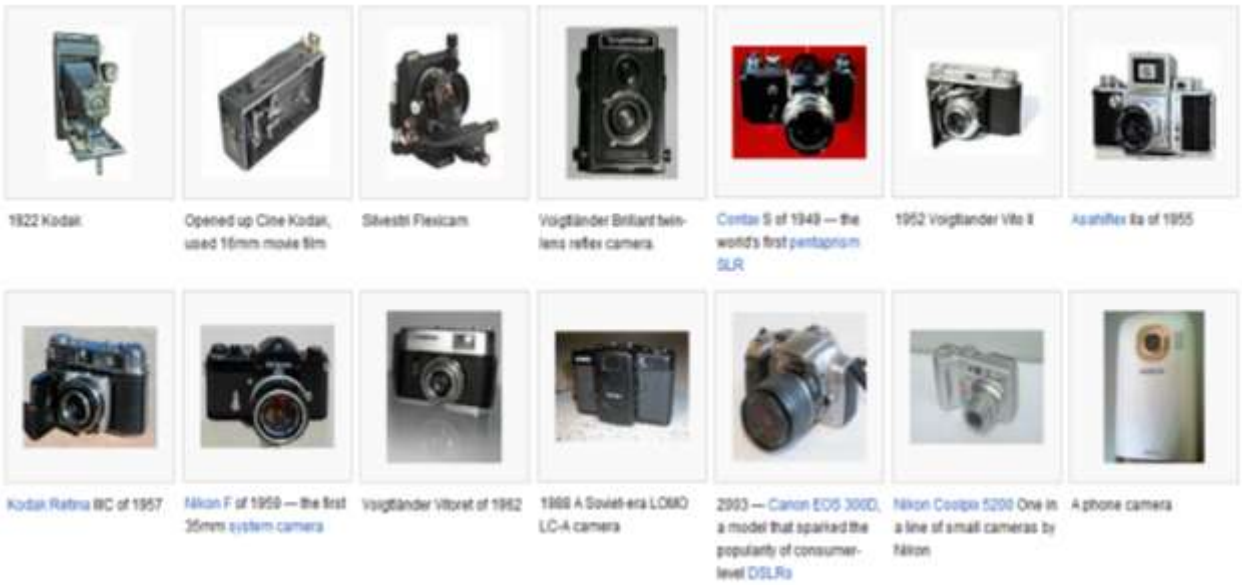
CAMERA ACCESSORIES

Accessories for cameras are mainly for care, protection, special effects and functions.

- Lens hood: used on the end of a lens to block the sun or other light source in order to prevent glare and lens flare.
- Lens cover: covers and protects the lens during storage
- Lens adapter: sometimes called a step-ring, adapts the lens to other size filters
- Lens extension tubes allow close focus in macro photography
- Flash equipment: including light diffuser, mount and stand, reflector, soft box, trigger and cord
- Care and protection: including camera case and cover, maintenance tools, and screen protector
- Large format cameras use special equipment which includes magnifier loupe, view finder, angle finder, focusing rail /truck.
- Battery and charge





1922 Kodak

Opened up Cine Kodak, used 16mm movie film

Silvestri Flexicam

Voigtländer Brilliant twin-lens reflex camera

Contax S of 1949 — the world's first pentaprism SLR

1952 Voigtländer Vito II

Asahiflex IIa of 1955

Kodak Retina IIIC of 1957

Nikon F of 1959 — the first 35mm system camera

Voigtländer Vitoret of 1962

1988 A Soviet-era LOMO LC-A camera

2003 — Canon EOS 300D, a model that sparked the popularity of consumer-level DSLRs

Nikon Coolpix 5200 One in a line of small cameras by Nikon

A phone camera

UNIT-II
LENS : MEANING, TYPES & THEIR FUNCTION

LENS:

Lens is the most important part of a camera. It forms a real and sharp image of the objct to be photographed. A camera lens is made from a good optical glass through some inexpensive cameras have lens is made from plastic or similar transparent materials. Lenses are mainly divided in to types, firstly a convex lens (also called as converging or positive lens) which is broad as the centre but narrow at the edges and forms a real image of an object onto a screen and secondly a concave lens (also called as diverging or negative lens) which is this at the centre but thick at the edges and can't form a real image. A camera is fitted with a convex type of lens.

TYPES OF LENS

Lenses are broadly divided in three types as under:

1) Normal/Standard Lens: a lens on a camera which records a view similar to the view seen be a normal human eye is called as a normal lens. A normal lens gives the perspective similar to the impression recorded by a normal human eye. Technically speaking a standard/normal lens is that whose focal length is numerically equal to the diagonal of picture format. A 35mm standard format has a diagonal equal to 43mm approximately, but standard focal length of the camera may vary from 45mm to 55mm and generally it is supplied with a standard lens of 50mm focal length. 12 square format 6x6 cm has a normal focal length of 80mm and a large format camera of 4"x5" format has focal length of 150mm. Angle of view of a normal on a 35mm camera measures 46" which is similar to the angle of view of a human eye. Cameras of different formats if fitted with their respective normal lenses record more or less similar view.

2) Wide angle/Short focus lens: A lens having focal length shorter than a normal lens is called a wide angle or short focus lens. Lenses with focal lengths 35mm, 28mm, 24mm, 20mm, 16mm, 12mm, 8mm, 6mm, etc. are called as wide angle lenses and they cover a wider view. As these lenses are used from close distances they generally record distortion. The things and relative distances between two object elongated. This is known as exaggerated perspective. Shorter the focal length wider the angle of view and more the distortion. 35mm & 28mm lenses are known as moderate wide angle lenses. 6mm to 12mm lenses are known as super wide angle or fish eye lenses and give dramatic distortions. Wide angle lenses are useful for functions, interiors, industrial photography indoors and for landscape, press, architectural photography out-doors. These lenses should never be used for taking normal close-up portraits.

3) Telephoto/Long focus lens: Lens with focal length longer than normal lens is called as telephoto/long focus. It has a narrow angle of view and gives telescopic effect hence the name telephoto lens. The perspective is shallow i.e. the relative distance between objects appears to be compressed. Longer the focal length narrower the angle view and more the telescopic effect. 70mm to 135mm lenses are known as moderate tele lenses and may be used indoors too. They area also known as portrait lenses as they give distortion free portraits 200mm to 500mm lenses are used outdoors for candid, nature, wildlife, bird, press and sports photography. Lenses with focal lengths beyond 500mm are

called a super tele lenses. Table below shows the angle of view of various lenses used with 35mm camera.

Special Lenses

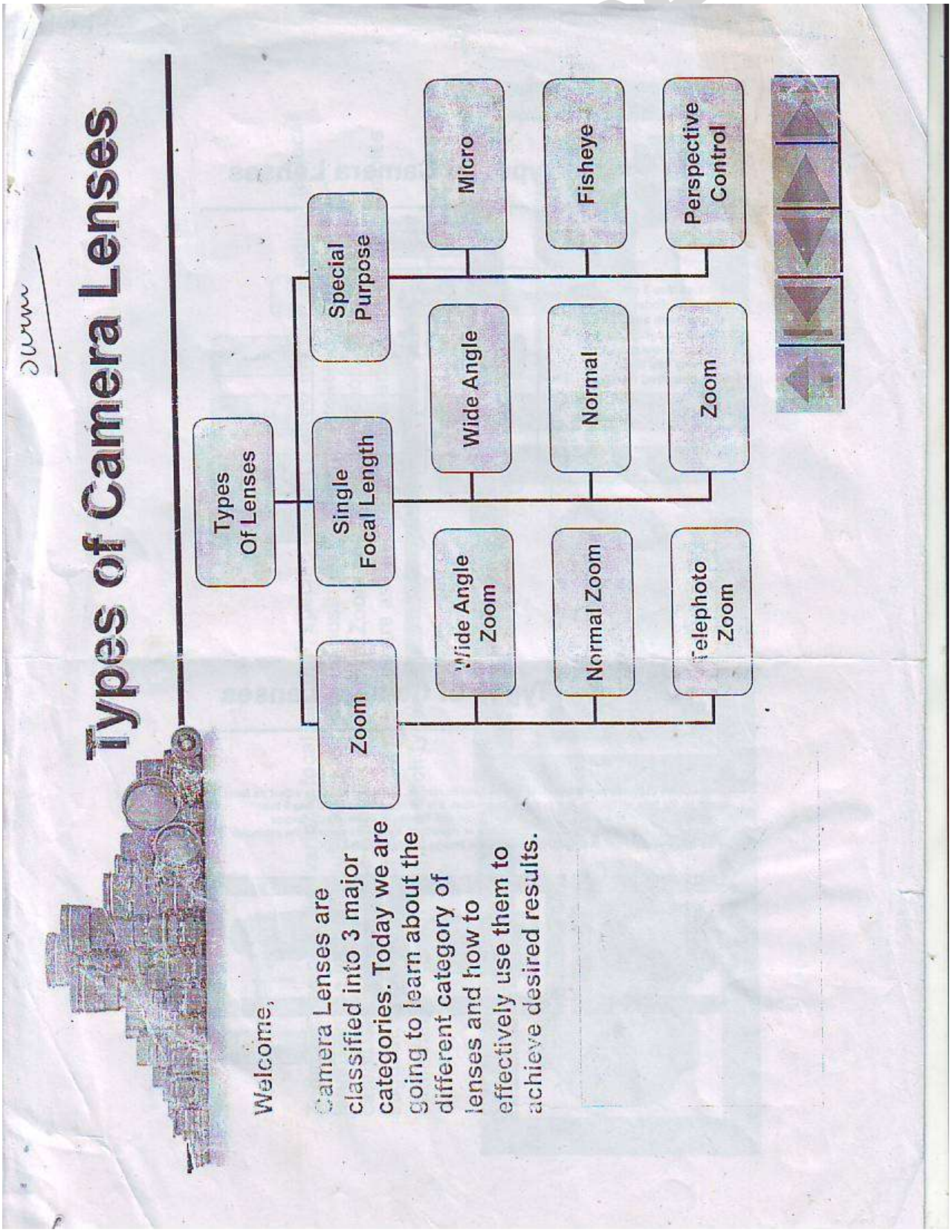
1) Zoom lens: A zoom lens is a variable focal length lens and it serves the purpose of a number of lenses of different focal lengths. It given a continuous shift of focal length within a certain range. As the angle of changes with focal length it makes possible to get different compositions without changing ranges such as 28-70mm, 28-85mm, 28-105mm, 28-135mm, 35-70mm, 35-105mm, etc. As all these lenses also include normal focal length 50mm they are called as normal/standard/zoom lenses. Normal zooms are useful in functions, portraiture, and press etc. Tele zooms are available in various ranges such as 70-210mm, 70-300mm etc and are generally used both indoors and outdoors. 28-200mm, 28-200mm re called as super zooms Wide zooms such as 17-35mm, 20-40mm etc are useful for industrial, interiors, architectural, landscape and press photography. Though definitions (sharpness) and contrast of a fixed focal length (also called as prime) lens are always better than that of zoom lenses have still become popular as they simplify photography to a greater extent. The focus remains constant throughout the zooming ring around the lens body or by pulling / pushing the focusing ring.

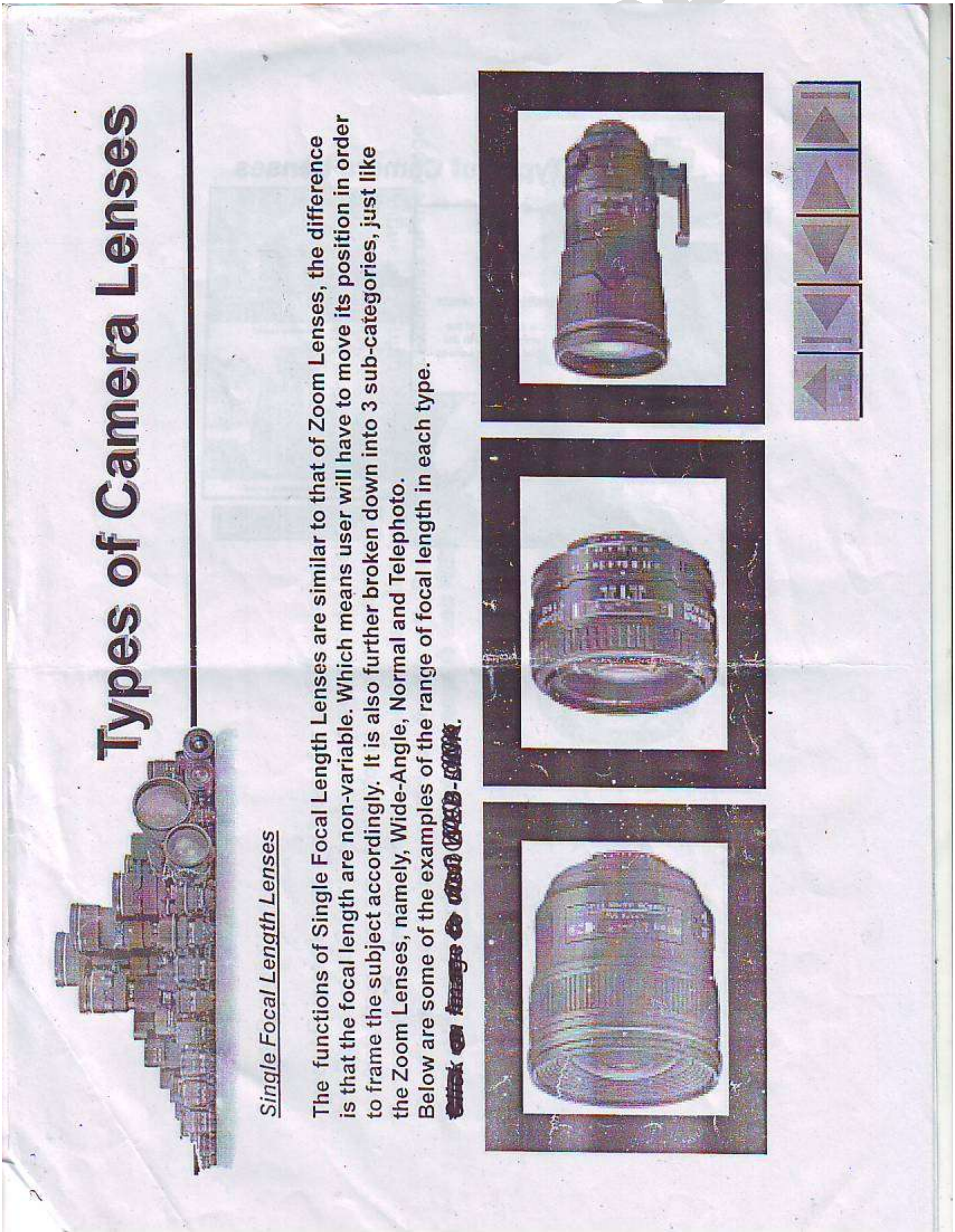
2) Macro lens: A macro lens is specially designed for macro/close-up-photography. It extends father away from the film to a greater extent and focuses on a very close object. (More details in the chapter on close-up photography).

Auxiliary lens:
Auxiliary lenses can not work independently on a camera, instead they are used in combination with a camera lens.

1) Teleconverter: The lens is placed between camera body and camera boy and camera lens so as to increase the focal length of camera lens by some multiple like 2x or 3x. A 2x converter doubles the focal length of a camera lens. There is a loss in effective aperture when a converter is used. E.g. a 2x converter makes f number 4 read as f8 hence exposure has to be increased by 2 stops. Picture quality also suffers to some extent.
2) Close-up Supplementary lens: This is a sample attachment for taking close up shots. Close-up lenses are positive lens elements and are attached on the front of a camera lens. (More details into the chapter on close-up photography).

Care of Lens: As lens is the most important part of a camera, one has to take utmost care of it. Put a lens cap when the camera is not is use. Remove the accumulated dust with blower blush. Wipe the lens with ether lens cleaning tissue or cotton wool or a piece of chamois leather. Lens cleaning liquid may also be used to remove oily stains on the lens surface. Do not clean the lens very often without reason. An U.V filter may be attached permanently on lens to protect it from small damages. Siliea gel crystals may be kept with a lens to slow down fungal growth caused by humidly.

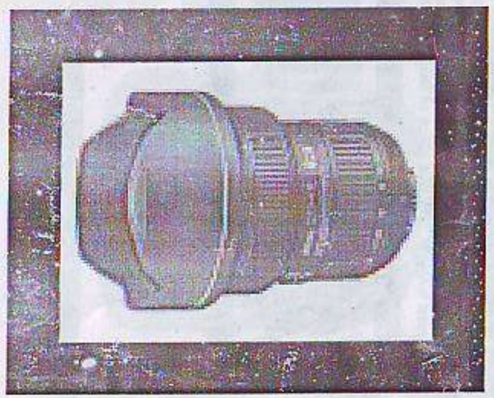

Types of Camera Lenses
Types Of Lenses
Zoom
Single Focal Length
Special Purpose
Wide Angle Zoom
Normal Zoom
Telephoto Zoom
Wide Angle
Normal
Zoom
Micro
Fisheye
Perspective Control
Welcome,
Camera Lenses are classified into 3 major categories. Today we are going to learn about the different category of lenses and how to effectively use them to achieve desired results.

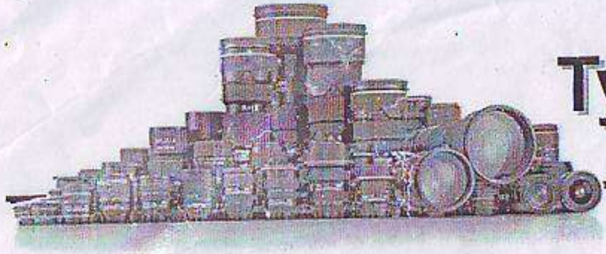

Types of Camera Lenses
Single Focal Length Lenses
The functions of Single Focal Length Lenses are similar to that of Zoom Lenses, the difference is that the focal length are non-variable. Which means user will have to move its position in order to frame the subject accordingly. It is also further broken down into 3 sub-categories, just like the Zoom Lenses, namely, Wide-Angle, Normal and Telephoto.
Below are some of the examples of the range of focal length in each type.

Types of Camera Lenses

Zoom Lenses

Zoom Lenses provides variable focal length of specific ranges, it allow the user to adjust its focal length on the lens without having to move its position. It is further broken down into 3 sub-categories, namely, Wide-Angle Zoom, Normal Zoom and Telephoto Zoom. As the names suggest, the functions of each type of lenses are as described. Below are some of the examples of the range of focal length in each type. [redacted]

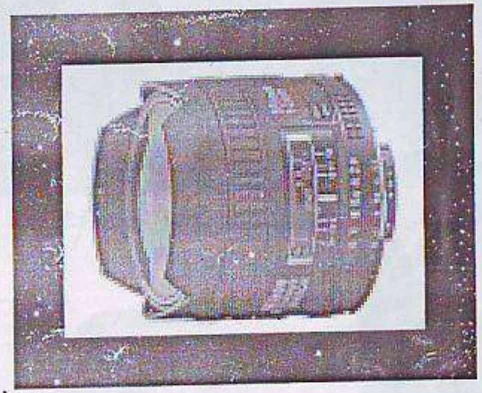


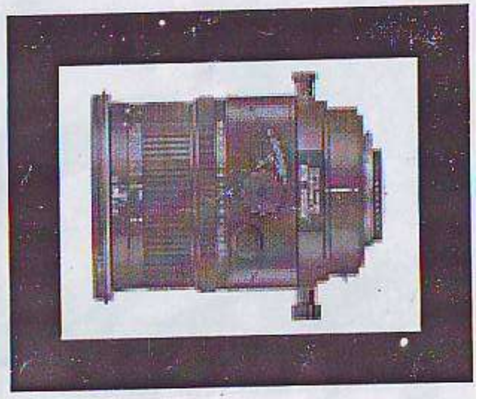


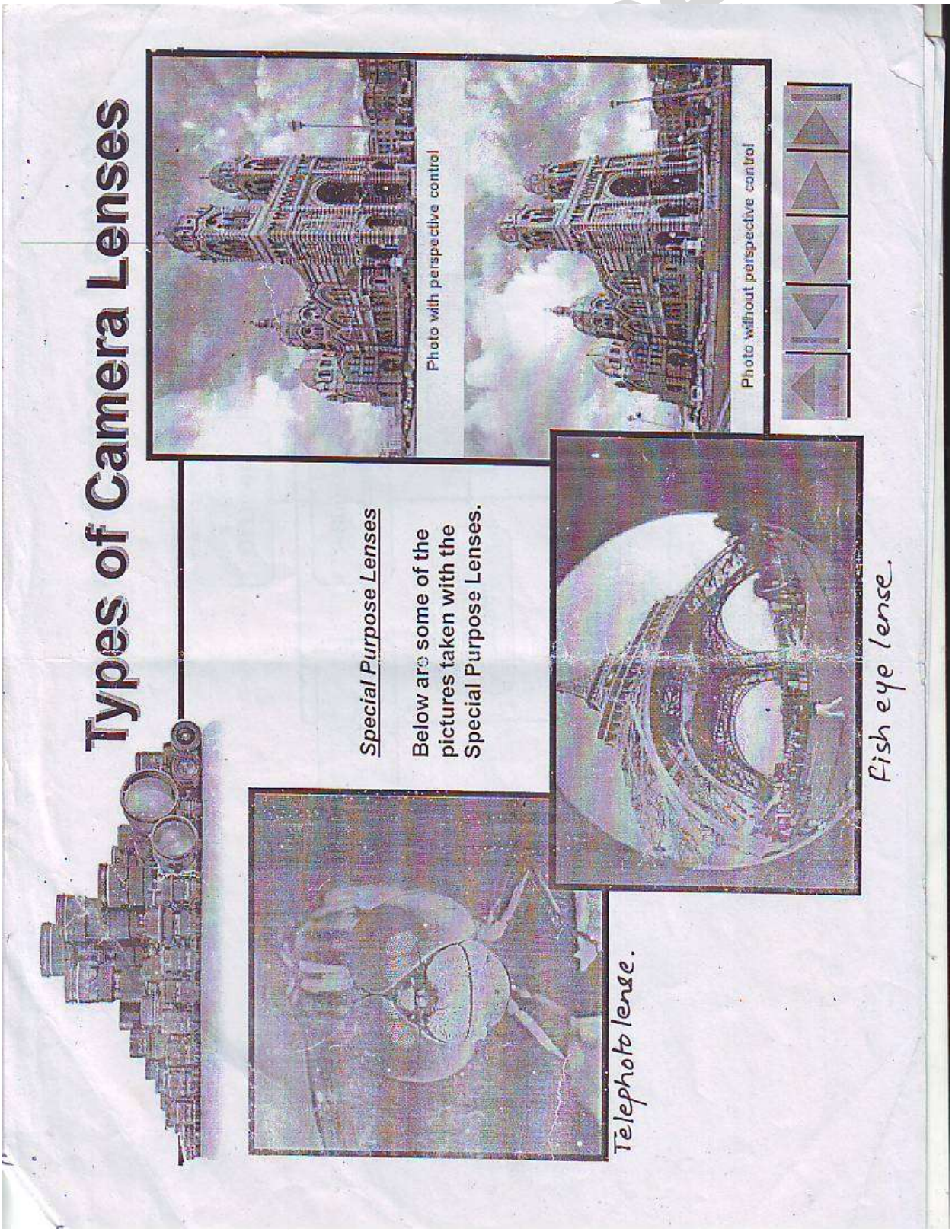
Types of Camera Lenses

Special Purpose Lenses

Special purpose lenses are meant for specific purposes, they are classified as Fisheye, Micro and Perspective Control. As the name suggested, a Fisheye lens will give high distortion to the subject. Micro Lens are used to focus on objects that are small and needs detailing and Perspective Control allows user to minimize distortion to subject by changing it tilt angle. These lenses are also of non-variable focal length. Below are some of the examples of the range of focal length in each type. Click on image to visit WEB LINK-






Types of Camera Lenses
Photo with perspective control
Photo without perspective control
Special Purpose Lenses
Below are some of the pictures taken with the Special Purpose Lenses.
Telephoto lense.
Fish eye lense.

UNIT-III

Types of films:

There are many types of films which can be used in variety of application is not a sin, it can be done for artistic effect)

- negative (prints)
- possitive (slides or transparencies)
- black and white
- color
- infra red
- color balanced (day light, tungten)
- variable speed
- professional
- and a host of ohers not generally used for normally photography
- digital quikly replacing film and dealt with in a separate chapter.

Cross section through color film showing its various layers

The Basic Principles of Photography:

Varies in intensity	Varies in color
Sunrise	violet
Sunset	red
Sunshine	white - stark
Overcast	diffused
Midday	short shadows
Midnight	
Indoors	green or orange

Photographic filters:

Four photographic filters:

1. Clockwise, from top-left,

2. an infrared hot mirror filter,
3. a polarizing filter,
4. A UV filters.

The larger filter is a polarizer for mounts. In photography and video graphs, a filter is a camera accessory consisting of an optical filter that can be inserted in the optical path. The filter can be a square or oblong shape mounted in a holder accessory, or, more commonly, a glass or plastic disk with a metal or plastic ring frame, which can be screwed in front of or clipped onto the lens.

Filters modify the images recorded. Sometimes they are used to make only subtle changes to images; other times the image would simply not be possible without them. In monochrome photography colored filters affect the relative brightness of different colors; red lipstick may be rendered as anything from almost white to almost black with different filters. Others change the color balance of images, so that photographs under incandescent lighting show colors as they are perceived, rather than with a reddish tinge. There are filters that distort the image in a desired way, diffusing an otherwise sharp image, adding a starry effect, etc. Supplementary close-up lenses may be classified as filters. Linear and circular polarizing filters reduce oblique reflections from non-metallic surfaces.

Many filters absorb part of the light available, necessitating longer exposure. As the filter is in the optical path, any imperfections—non-flat or non-parallel surfaces, reflections (minimized by optical coating), scratches, dirt—affect the image. There is no universal standard naming system for filters. The Written numbers adopted in the early twentieth century by Kodak, then a dominant force in film photography, are used by several manufacturers. Color correction filters are often identified by a code of the form CC50Y—CC for color correction, 50 for the strength of the filter, Y for yellow.

Optical filters are used in various areas of science, including in particular astronomy; they are essentially the same as photographic filters, but in practice often need far more accurately-controlled optical properties and precisely-defined transmission curves than filters exclusively for photographic use. Photographic filters sell in larger quantities at correspondingly lower prices than many laboratory filters. The article on optical filters has material relevant to photographic filters.

Uses of filters in photography: Filters in photography can be classified according to their use:

- Clear and ultraviolet
- Color correction
- Color conversion (or light balance)
- Color separation, also called color subtraction
- Contrast enhancement
- Infrared
- Neutral density, including the graduated neutral density filter and solar filter
- Polarizing
- Special effects of various kinds, including
- Graduated color, called color grads
- Cross screen and star diffractions
- Diffusion and contrast reduction
- Spot
- Close-up or macro diopters, and split diopters or split focus

Clear and ultraviolet

Clear filters, also known as window glass filters or optical flats, are transparent, and (ideally) perform no filtering of incoming light. The only use of a clear filter is to protect the front of a lens.

UV filters are used to reduce haziness created by ultraviolet light, to which photographic film and sensors are sensitive, but not the human eye. A UV filter passes all or most of the visual spectrum, and blocks ultraviolet radiation. (Most spectral manipulation filters are named for the radiation they pass; green and infrared filters *pass* their named colors, but a UV filter *blocks* UV.) It can be left on the lens for nearly all shots: UV filters are often used mainly for lens protection in the same way as clear filters. A strong UV filter, such as a Haze-2A or UV17, cuts off some visible light in the violet part of the spectrum, and has a pale yellow color; these strong filters are more effective at cutting haze,[1][2] and can reduce purple fringing in digital cameras.[3] Strong UV filters are also sometimes used for warming color photos taken in shade with daylight-type film.

Nikon D700 with broken filter B+W UV 010 and lens Nikkor 28-85mm

While in certain cases, such as harsh environments, a protection filter may be necessary, there are also downsides to this practice. Arguments for the use of protection filters include:

- If the lens is dropped, the filter may well suffer scratches or breakage instead of the front lens element.
- The filter can be cleaned frequently without damage to the lens surface or coatings; a filter scratched by cleaning is much less expensive to replace than a lens.
- If there is blowing sand the filter may protect the lens from abrasion from sand
- A few lenses, such as some of Canon's L series lenses, require the use of a filter to complete the weather sealing

Arguments against their use include:

- Adding another element degrades image quality due to aberration caused by less-than-perfect flatness and parallelism of surfaces, and some unavoidable flare due to reflections at additional air-glass interfaces.[8] Low-quality filters may cause problems with autofocus.[*citation needed*]
- It may sometimes prevent the use of lens hoods that screw into the lens, since threading a lens hood on top of the clear filter might cause igniting on some lenses, and since not all clear filters mechanically allow a hood to be attached.

There is a wide variance in the spectral UV blocking by filters described as ultraviolet.

Color conversion

Appropriate color conversion filters are used to compensate for the effects of lighting not balanced for the film stock's rated color temperature (usually 3200 K for professional tungsten's and 5500 K for daylight): e.g., the 80A blue filter used with film for daylight use corrects the perceived orange/reddish cast of incandescent photographic photoflood lighting (for which the usual photographic term is

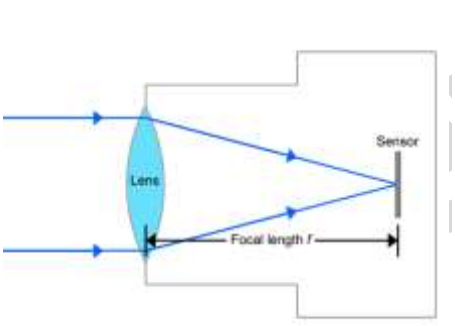
"tungsten lighting"), and significantly improves the stronger cast produced by lower-temperature household incandescent lighting, while the 85B will correct the bluish cast of daylight photographs on tungsten film. Color correction filters are identified by non-standardized numbers which vary from manufacturer to manufacturer. The need for these filters has been greatly reduced by the widespread adoption of digital photography, since color balance may be corrected with camera settings as the image is captured, or by software manipulation afterwards.

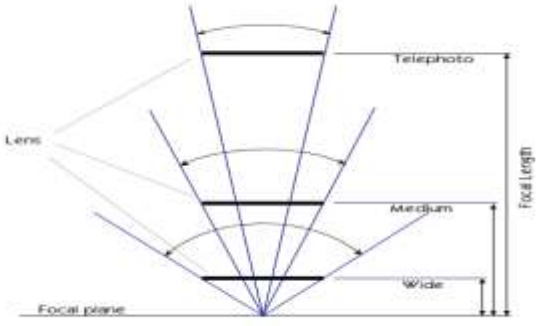
The 80A filter, mainly used to correct for the excessive redness of tungsten lighting, can also be used to oversaturated scenes that already have blue. The photo on the left was shot with a polarizer, while the one on the right was shot with a polarizer and an 80A filter. Color conversion filters (LB filters) must be distinguished from color correction filters (CC filters), which filter out a particular color cast f.e. caused by Schwarzschild effect etc.

Focal length

Focal length, usually represented in millimeters (mm), is the basic description of a photographic lens. It is not a measurement of the actual length of a lens, but a calculation of an optical distance from the point where light rays converge to form a sharp image of an object to the digital sensor or 35mm film at the focal plane in the camera. The focal length of a lens is determined when the lens is focused at infinity. The focal length tells us the angle of view—how much of the scene will be captured—and the magnification—how large individual elements will be. The longer the focal length, the narrower the angle of view and the higher the magnification, the shorter the focal length and the wider the angle of view, the lower the magnification.

The focal length of a lens is defined as the distance in mm from the optical center of the lens to the focal point, which is located on the sensor or film if the subject (at infinity) is "in focus". The camera lens projects part of the scene onto the film or sensor. The field of view (FOV) is determined by the angle of view from the lens out to the scene and can be measured horizontally or vertically. Larger sensors or films have wider FOVs and can capture more of the scene. The FOV associated with a focal length is usually based on the 35mm film photography, given the popularity of this format over other formats.





Aperture

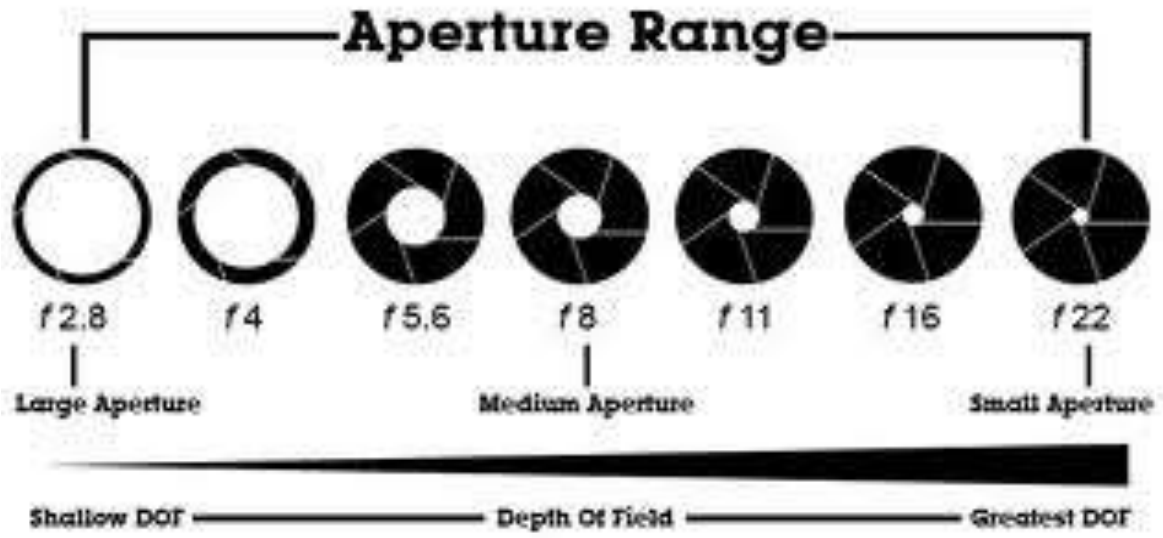
An **aperture** is a hole or an opening through which light travels. More specifically, the aperture of an optical system is the opening that determines the cone angle of a bundle of rays that come to a focus in the image plane. The aperture determines how collimated the admitted rays are, which is of great importance for the appearance at the image plane. If an aperture is narrow, then highly collimated rays are admitted, resulting in a sharp focus at the image plane. If an aperture is wide, then uncollimated rays are admitted, resulting in a sharp focus only for rays with a certain focal length. This means that a wide aperture results in an image that is sharp around what the lens is focusing on and blurred otherwise. The aperture also determines how many of the incoming rays are actually admitted and thus how much light reaches the image plane (the narrower the aperture, the darker the image for a given exposure time). In the human eye, the pupil is the aperture.

An optical system typically has many openings, or structures that limit the ray bundles (ray bundles are also known as *pencils* of light). These structures may be the edge of a lens or mirror, or a ring or other fixture that holds an optical element in place, or may be a special element such as a diaphragm placed in the optical path to limit the light admitted by the system. In general, these structures are called stops, and the aperture stop is the stop that determines the ray cone angle, or equivalently the brightness, at an image point.

In some contexts, especially in photography and astronomy, *aperture* refers to the *diameter* of the aperture stop rather than the physical stop or the opening itself. For example, in a telescope the aperture stop is typically the edges of the objective lens or mirror (or of the mount that holds it). One then speaks of a telescope as having, for example, a 100 centimeter *aperture*. Note that the aperture stop is not necessarily the smallest stop in the system. Magnification and demagnification by lenses and other elements can cause a relatively large stop to be the aperture stop for the system. Sometimes stops and diaphragms are called apertures, even when they are not the aperture stop of the system. The word aperture is also used in other contexts to indicate a system which blocks off light outside a certain region. In astronomy for example, a photometric aperture around a star usually corresponds to a circular window around the image of a star within which the light intensity is assumed The aperture stop of a photographic lens can be adjusted to control the amount of light reaching the film or image sensor. In combination with variation of shutter speed, the aperture size will regulate the film's or image sensor's degree of exposure to light. Typically, a fast shutter will require a larger aperture to ensure sufficient light exposure, and a slow shutter will require a smaller aperture to avoid excessive exposure. Diagram of decreasing aperture sizes (increasing f-numbers) for "full stop" increments (factor of two aperture area per stop)

A device called a diaphragm usually serves as the aperture stop, and controls the aperture. The diaphragm functions much like the iris of the eye – it controls the effective diameter of the lens opening. Reducing the aperture size increases the depth of field, which describes the extent to which subject matter lying closer than or farther from the actual plane of focus appears to be in focus. In general, the smaller the aperture (the larger the number), the greater the distance from the plane of focus the subject matter may be while still appearing in focus. The lens aperture is usually specified as an f-number, the ratio of focal length to effective aperture diameter. A lens typically has a set of marked "f-stops" that the f-number can be set to. A lower f-number denotes a greater aperture opening which allows more light to reach the film or image sensor. The photography term "one f-stop" refers to a factor of $\sqrt{2}$ (approx. 1.41) change in f-number, which in turn corresponds to a factor of 2 changes in light intensity.

Typical ranges of apertures used in photography are about *f*/2.8–*f*/22 or *f*/2–*f*/16,[5] covering 6 stops, which may be divided into wide, middle, and narrow of 2 stops each, roughly (using round numbers) *f*/2–*f*/4, *f*/4–*f*/8, and *f*/8–*f*/16 or (for a slower lens) *f*/2.8–*f*/5.6, *f*/5.6–*f*/11, and *f*/11–*f*/22. These are not sharp divisions, and ranges for specific lenses vary.



Shutter speed

The camera's shutter speed, the lens's brightness (f-number), and the scene's luminance together determine the amount of light that reaches the film or sensor (the exposure). Exposure value (EV) is a single quantity that accounts for the shutter speed and the f-number.

In addition to its effect on exposure, the shutter speed changes the way movement appears in photographs. Very short shutter speeds can be used to freeze fast-moving subjects, for example at sporting events. Very long shutter speeds are used to intentionally blur a moving subject for artistic effect. Short exposure times are sometimes called "fast", and long exposure times "slow".

Adjustment to the aperture controls the depth of field, the distance range over which objects are acceptably sharp; such adjustments need to be compensated by changes in the shutter speed.

In early days of photography, available shutter speeds were not standardized, though a typical sequence might have been 1/10 s, 1/25 s, 1/50 s, 1/100 s, 1/200 s and 1/500 s. Following the adoption of a standardized way of representing aperture so that each major step exactly doubled or halved the amount of light entering the camera (*f*/2.8, *f*/4, *f*/5.6, *f*/8, *f*/11, *f*/16, etc.), a standardized 2:1 scale was adopted for shutter speed so that opening one aperture stop and reducing the shutter speed by one step resulted in the identical exposure. The agreed standards for shutter speeds are:

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

Depth of field:
Depth of field refers to the range of distance that appears acceptably sharp. It varies depending on camera type, aperture and focusing distance, although print size and viewing distance can also influence our perception of depth of field. This tutorial is designed to give a better intuitive and technical understanding for photography, and provides a depth of field calculator to show how it varies with your camera settings. The depth of field does not abruptly change from sharp to unsharp, but instead Occurs as a gradual Transition. In fact everything immediately in front of or in back of the focusing distance beings to lose Sharpness – even if this is not perceived by our eyes or by the resolution of the camera.

Circle of confusion: Since there is no critical point of transition, a more rigorous term called 'circle of confusion I used to define how much a point needs to be blurred in order to perceived as unsharp when the circle of confusion becomes perception to or eyes. This region is said to be outside the depth of field and thus no longer "acceptable sharp". The circle of confusion above has been exaggerated for clarity: in reality this would be only a tiny fiction of the camera sensor's area.

CONTROLLING DEPTH OF FIELD

Although print size and viewing distance influence how large the circle of confusion appears to our eyes, aperture and focusing distance distance are the two main factors that determine how big the circle of confusion will be on your camera's sensor. Larger apertures (smaller F-stop number) and closer focusing distances produce a shallower depth of field. The following test maintains the same focus distance, but changes the aperture setting:

f/8.0
/5.6
f/2.8

note: images taken with a 200 mm lens (320 mm field of view on a 35 mm camera)

CLARIFICATION: FOCAL LENGTH AND DEPTH OF FIELD

Note that focal length has not been listed as influencing depth of field, contrary to popular belief. Even though telephoto lenses appear to create a much shallower depth of field, this is mainly because they are often used to magnify the subject when one is unable to get closer. If the subject occupies the same fraction of the image (constant magnification) for both a telephoto and a wide angle lens, the total depth of field is virtually* constant with focal length! This would of course require you to either get much closer with a wide angle lens or much further with a telephoto lens, as demonstrated in the following chart:

Focal Length (mm)	Focus Distance (m)	Depth of Field (m)
10	0.5	0.482
20	1.0	0.421
50	2.5	0.406
100	5.0	0.404
200	10	0.404
400	20	0.404

Note: Depth of field calculations are at f/4.0 on a camera with a 1.6X crop factor, using a circle of confusion of 0.0206 mm.

Note how there is indeed a subtle change for the smallest focal lengths. This is a real effect, but is negligible compared to both aperture and focusing distance. Even though the total depth of field is virtually constant, the fraction of the depth of field which is in front of and behind the focus distance does change with focal length, as demonstrated below:

Distribution of the Depth of Field

Focal Length (mm)	Rear	Front
10	70.2 %	29.8 %
20	60.1 %	39.9 %
50	54.0 %	46.0 %
100	52.0 %	48.0 %
200	51.0 %	49.0 %
400	50.5 %	49.5 %

This exposes a limitation of the traditional DoF concept: it only accounts for the total DoF and not its distribution around the focal plane, even though both may contribute to the perception of sharpness. Note how a wide angle lens provides a more gradually fading DoF behind the focal plane than in front, which is important for traditional landscape photographs.

Longer focal lengths may also appear to have a shallower depth of field because they enlarge the background relative to the foreground (due to their narrower angle of view). This can make an out of focus background look even more out of focus because its blur has become enlarged. However, this is another concept entirely, since depth of field only describes the sharp region of a photo — not the blurred regions.

On the other hand, when standing in the same place and focusing on a subject at the same distance, a longer focal length lens will have a shallower depth of field (even though the pictures will frame the subject entirely differently). This is more representative of everyday use, but is an effect due to higher magnification, not focal length.

Depth of field also appears shallower for SLR cameras than for compact digital cameras, because SLR cameras require a longer focal length to achieve the same field of view (see the tutorial on digital camera sensor sizes for more on this topic).

*Technical Note: We describe depth of field as being virtually constant because there are limiting cases where this does not hold true. For focal distances resulting in high magnification, or very near the hyperfocal distance, wide angle lenses may provide a greater DoF than telephoto lenses. On the other hand, at high magnification the traditional DoF calculation becomes inaccurate due to another factor: pupil magnification. This reduces the DoF advantage for most wide angle lenses, and increases it for telephoto and macro lenses. At the other limiting case, near the hyperfocal distance, the increase in DoF arises because the wide angle lens has a greater rear DoF, and can thus more easily attain critical sharpness at infinity.

CALCULATING DEPTH OF FIELD

In order to calculate the depth of field, one needs to first decide on an appropriate value for the maximum allowable circle of confusion. This is based on both the camera type (sensor or film size), and on the viewing distance / print size combination. Needless to say, knowing what this will be ahead of time often isn't straightforward. Try out the depth of field calculator tool to help you find this for your specific situation.

DEPTH OF FOCUS & APERTURE VISUALIZATION

Another implication of the circle of confusion is the concept of depth of focus (also called the "focus spread"). It differs from depth of field because it describes the distance over which light is focused at the camera's sensor, as opposed to the subject:

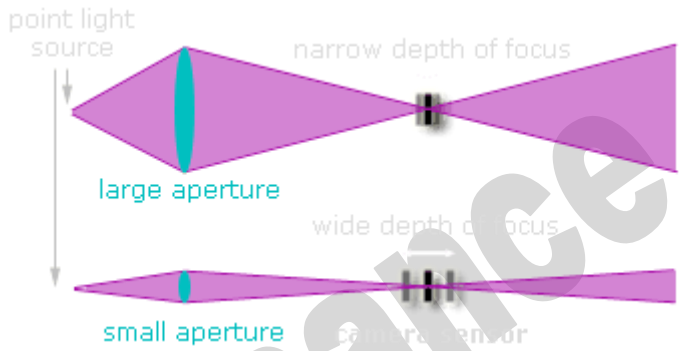
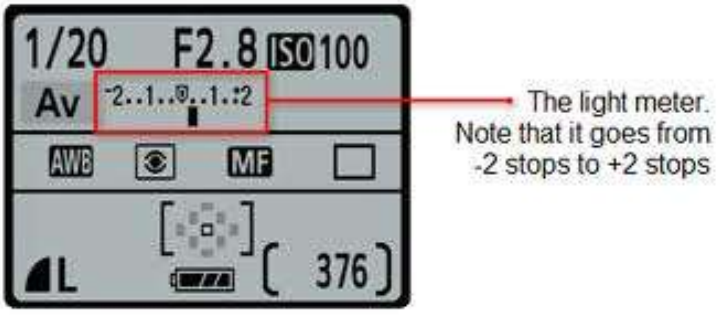


Diagram depicting depth of focus versus camera aperture. The purple lines comprising the edge of each shaded region represent the extreme angles at which light could potentially enter the aperture. The interior of the purple shaded regions represents all other possible angles.
The key concept is this: when an object is in focus, light rays originating from that point converge at a point on the camera's sensor. If the light rays hit the sensor at slightly different locations (arriving at a disc instead of a point), then this object will be rendered as out of focus — and increasingly so depending on how far apart the light rays are.

Exposure meter

In photography exposure meter is an instrument for measuring the amount of light falling on or being reflected by a subject, and usually equipped to convert this measurement into usable information, such as the shutter speed and aperture size required to take a reasonable photograph. The earliest type of light meters were called extinction meters and contained a numbered or lettered row of neutral density filters of increasing density. The photographer would position the meter in front of his subject and note the filter with the greatest density that still allowed incident light to pass through. The letter or number corresponding to the filter was used as an index into a chart of appropriate aperture and shutter speed combinations for a given film speed.
Extinction meters suffered from the problem that they depended on the light sensitivity of the human eye (which can vary from person to person) and subjective interpretation.
Selenium and silicon light meters use sensors that are photovoltaic: they generate a voltage proportional to light exposure. Selenium sensors generate enough voltage for direct connection to a meter; they need no battery to operate and this made them very convenient in completely mechanical cameras. Selenium sensors however cannot measure low light accurately (ordinary light bulbs can take them close to their limits) and are altogether unable to measure very low light, such as candlelight, moonlight, starlight etc. Silicon sensors need amplification circuit and require a power source such as batteries to operate. CDS light meters use a sensor based on photo resistance, i.e. their electrical resistance changes proportionately to light exposure. These also require a battery to operate. Most modern light meters use silicon or CDS sensors. They indicate the exposure either with a needle galvanometer or on an LCD screen.



UNIT-IV

COMPOSITION IN PHOTOGRAPHY

WHAT IS PHOTOGRAPHIC COMPOSITION?

Composition is the arrangement of subjects or elements within the photographic frame. How thesubjects are selected and arranged can make a big difference to your photograph. As aphotographer, you control the arrangement and the look of the image. You decide what the focalpoint of interest is and where to place it within the frame so that the viewer will be drawn to thepicture. Design elements such as line, shape, pattern and color have a dual function. Firstly, theirpresence helps to create a stronger image. Secondly, each element has intrinsic and symbolicattributes which can evoke certain emotions and feelings in the viewer. For example, curvedlines give the feeling of gracefulness and calmness; diagonal lines can be dramatic and powerful;patterns can be repetitive and structured

Balancing Elements

Placing your main subject off-centre, as with the rule of thirds, creates a more interesting photo, but it can leave a void in the scene which can make it feel empty. You should balance the "weight" of your subject by including another object of lesser importance to fill the space.

Here, the visual "weight" of the road sign is balanced by the building on the other side of the shot. Image by Shannon Kokoska.

Leading Lines

When we look at a photo our eye is naturally drawn along lines. By thinking about how you place lines in your composition, you can affect the way we view the image, pulling us into the picture, towards the subject, or on a journey "through" the scene. There are many different types of line - straight, diagonal, curvy, zigzag, radial etc - and each can be used to enhance our photo's composition.

The road in this photo draws your eye through the scene. Image by Pierre Metivier.

Symmetry and Patterns

We are surrounded by symmetry and patterns, both natural and man-made., They can make for very eye-catching compositions, particularly in situations where they are not expected. Another great way to use them is to break the symmetry or pattern in some way, introducing tension and a focal point to the scene.

The symmetry of this chapel is broken by the bucket in the bottom right corner. Image by Fabio Montalto.

Viewpoint

Before photographing your subject, take time to think about where you will shoot it from. Our viewpoint has a massive impact on the composition of our photo, and as a result it can greatly affect the message that the shot conveys. Rather than just shooting from eye level, consider photographing from high above, down at ground level, from the side, from the back, from a long way away, from very close up, and so on.

The unusual viewpoint chosen here creates an intriguing and slightly abstract photo. Image by ronsho.

Background

How many times have you taken what you thought would be a great shot, only to find that the final image lacks impact because the subject blends into a busy background? The human eye is excellent at distinguishing between different elements in a scene, whereas a camera has a tendency to flatten the foreground and background, and this can often ruin an otherwise great photo. Thankfully this problem is usually easy to overcome at the time of shooting - look around for a plain and unobtrusive background and compose your shot so that it doesn't distract or detract from the subject.

The plain background in this composition ensures nothing distracts from the subject. Image by Philipp Naderer.

Depth

Because photography is a two-dimensional medium, we have to choose our composition carefully to conveys the sense of depth that was present in the actual scene. You can create depth in a photo by including objects in the foreground, middle ground and background. Another useful composition technique is overlapping, where you deliberately partially obscure one object with another. The human eye naturally recognises these layers and mentally separates them out, creating an image with more depth.

Emphasise your scene's depth by including interesting subjects at varying distances from the camera. Image by Jule Berlin.

Framing

The world is full of objects which make perfect natural frames, such as trees, archways and holes. By placing these around the edge of the composition you help to isolate the main subject from the outside world. The result is a more focused image which draws your eye naturally to the main point of interest.

Here, the surrounding hills form a natural frame, and the piece of wood provides a focal point. Image by Sally Crossthwaite.

Cropping

Often a photo will lack impact because the main subject is so small it becomes lost among the clutter of its surroundings. By cropping tight around the subject you eliminate the background "noise", ensuring the subject gets the viewer's undivided attention.

Cut out all unnecessary details to keep keep the viewer's attention focused on the subject. Image by Hien Nguyen.

Experimentation

With the dawn of the digital age in photography we no longer have to worry about film processing costs or running out of shots. As a result, experimenting with our photos' composition has become a real possibility; we can fire off tons of shots and delete the unwanted ones later at absolutely no extra cost. Take advantage of this fact and experiment with your composition - you never know whether an idea will work until you try it.

Digital photography allows us to experiment with different compositions until we find the perfect one. Image by Jule Berlin.

Composition in photography is far from a science, and as a result all of the "rules" above should be taken with a pinch of salt. If they don't work in your scene, ignore them; if you find a great composition that contradicts them, then go ahead and shoot it anyway. But they can often prove to be spot on, and are worth at least considering whenever you are out and about with your camera.

Rule of third

The rule of thirds is one of the main "rules" in art and photographic composition and stems from the theory that the human eye naturally gravitates to intersection points that occur when an image is split into thirds.

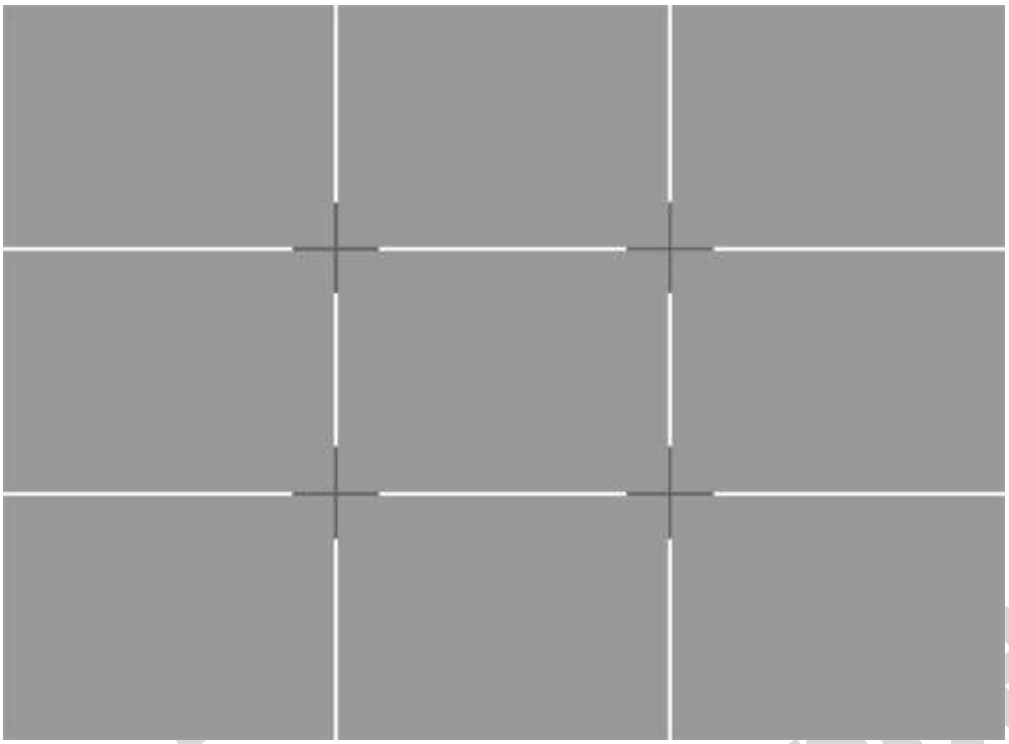
I'd like to note that I'd rather define this compositional technique as a guideline rather than a rule, but for the sake of consistency with other photography sources, I'll continue to call it the *rule* of thirds.

Rule of Thirds Definition

In the rule of thirds, photos are divided into thirds with two imaginary lines vertically and two lines horizontally making three columns, three rows, and nine sections in the images. Important compositional elements and leading lines are placed on or near the imaginary lines and where the lines intersect.

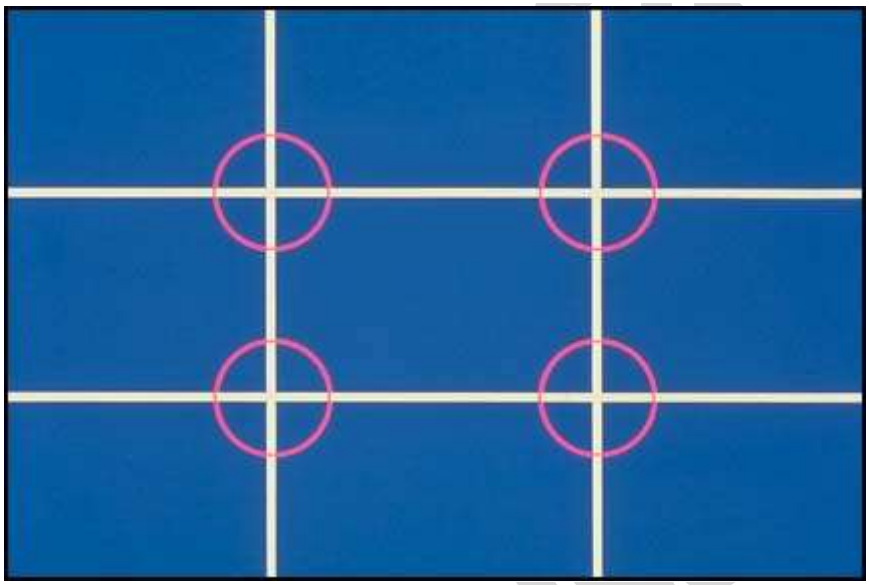
When taking a photograph with the rule of thirds in mind, it's always best to compose the photograph in the camera. This is so that you can avoid cropping later to retain as much of the image as possible and avoid reducing the quality of your photographs. However, I encourage going back to some of your older photography and seeing if you can improve them by cropping in a way to make them use the rule of thirds technique.

Rule of Thirds Grid



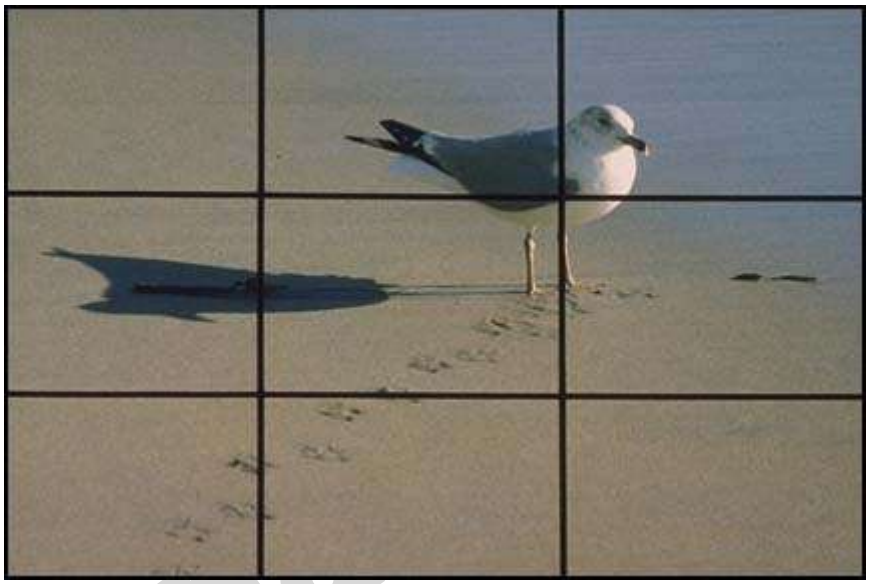
Examples of rule of third

You can use the **rule of thirds** as a guide in the off-center placement of your subjects. Here's how it works.



Before you snap the picture, imagine your picture area divided into thirds both horizontally and vertically. The intersections of these imaginary lines suggest four options for placing the center of interest for good composition. The option you select depends upon the subject and how you would like that subject to be presented.

Highlights



We picked the upper-right position for this subject so that we could see the full shadow and most of the tracks that lead to the seagull.

The lighthouse seems well placed in the upper right just because the rest of the scene fits nicely into the format.

Here's a case where you have excellent subject control. You can have the model pose anywhere along the walkway. The rule of thirds indicates this placement which also gives the model a definite path to follow within the picture area.

You should always consider the path of moving subjects and, generally, leave space in front of them into which they can move.

If you don't, here's what can happen! This jogger looks like she's going to run right out of the picture.

By placing the subject in the lower-left position, we've used the rule of thirds and given the jogger plenty of room to run within the picture.

Here's another action shot where it's important to leave more space in front of a moving subject than behind it.

You can also apply the rule of thirds guidelines to the placement of the horizon in your photos. Here the center position of the boat and horizon results in a static feeling.

Let's move the horizon to the upper third and the sailboat to the left. Remember, these are the only guidelines. So if you don't like this subject placement, try another.

Like this. We've moved the horizon line to the lower third. In general, place the horizon high or low in your scenics, but rarely in the middle.

Just as it's usually best to place horizons off center, it's also best to place verticals off center. For instance, in the picture on the left, the subject is centered, but on the right, the photographer got a more effective photograph by simply changing the viewpoint.