Intro to Digital Photography

Class description:
Learn the fundamentals of digital photography using DSLR cameras.

What is a DSLR?
A digital single lens reflex camera is also referred to as a DSLR or SLR camera. These cameras use a mirror to reflect light from the lens up into a pentaprism which reflects the image into the viewfinder. These cameras have large image sensors behind the mirror which allows the camera to take high-quality photographs. The image sensors are one of the most delicate parts of the camera. Another key feature of using a DSLR is the ability to change lenses as well as the added benefit of having easily accessible manual options, which makes them very versatile for a variety of shooting scenarios.
**Equipment Care:**

**Cameras:**
- Do not drop the camera
- The cameras are NOT waterproof
- Keep cameras and SD cards away from magnets
- Do not leave in excessive heat or direct sunlight
- Do not touch the electrical contacts with your fingers
- Avoid exposing the image sensor to any type of debris
- Always keep either a lens or dust cover on the camera

**Lenses:**
- Do not touch the glass parts of the lenses
- Do not drop the lenses
- The lenses are not waterproof
- Do not leave in excessive heat or direct sunlight
- Avoid exposing the image sensor to any type of debris
- Do not manipulate the focus ring when the switch is set to AF
- Only use the recommended camera cleaning supplies to clean the lenses
- Do not wipe the lenses with your shirt or any clothing

**Attaching Lenses**

*When changing lenses, do so quickly in a place with minimal dust.*
- Remove the caps
- Align the red or white dots and turn clockwise until the lens clicks into place
- Set the focus mode on the lens to either auto focus (AF) or manual focus (MF)
- To detach lens, press the lens release button and turn lens counterclockwise and reattach caps.

**Holding the Camera**
- Consider having your strap go over the shoulder instead of around the neck.
  - For heavier cameras, a camera strap around the neck could add unnecessary strain. You may not feel it right away, but you will feel it if you shoot for a long period of time.
  - It looks more professional. The camera around the neck generally makes people look like tourists.
- Wrap your right hand around the camera grip and place your index finger on the shutter button.
- Place your left hand under the lens.
- Keep your elbows in close to your body and keep the camera as still as possible.
- Maintain a stable stance by placing one foot slightly ahead of the other.
- Press camera against your face and look through the viewfinder.
  - You can give yourself a little bit of added stabilization by gently pressing the camera to your face.
**Shutter Button**
- Pressing the button halfway will activate autofocusing and the automatic exposure system
- Pressing the button completely will take a picture

**Manual Mode**
To acquire a better understanding of your camera as well as key concepts of photography, one should consider shooting in manual mode. Manual mode is one of the main settings on your camera that allows you, as the photographer, to make all of the decisions to create your desired image. You are able to control **Aperture**, **Shutter Speed**, and **ISO**. These are the three main components of **Exposure**, which determines how light or dark your image is.
Exposure Triangle

The exposure triangle is a visual representation of the relationships between three main variables that determine the exposure of a photograph. These include Aperture, Shutter Speed and ISO. These 3 main categories share relationships with their corresponding subcategories, Depth of Field, Motion Blur, and Noise. Knowing how all these variables work together provides the photographer with unlimited creativity and the knowledge to create exceptional images.
**Aperture:**

The aperture is the opening that controls the amount of light that passes through a lens. In photography, aperture is represented in f-stops. Each lens will determine how large or small the aperture can get.

- Aperture doesn’t just control how much light that gets in, it also controls what’s call the **depth of field**.
- The lower the f-stop, the blurrier the background. This is ideal for portrait or product photography.
- The higher the f-stop the sharper the background. This is ideal for landscape photography.
Scenarios for shooting at a low f-stop?
It's an artistic aesthetic and a very logical one for isolating the subject from its surroundings. This is good for portraits, as blurring the background while the subject is in focus naturally draws the viewer's attention to that subject.

Scenarios for shooting at a high f-stop?
If you want everything in focus. This is good for landscape photography. You want the rock in front of you to be sharp as well as the mountains in the distance. Or in real estate, you want the viewer to see as much as they can of the exterior or interior of a building. Another example is if you're taking your kids to the Disneyland or the Grand Canyon. You want your kids in focus, but you also want to see the place where you were visiting.
**Shutter Speed:**
Shutter speed controls how long the sensor is exposed to light and is measured in seconds or fraction of seconds. The larger the denominator, the faster the shutter. This allows the photographer to freeze or capture motion in the photograph.

Faster shutter speeds freeze motion and slower shutter speeds capture motion.
If you are shooting handheld and are using a shutter speed slower than approximately 1/60 of a second, you may encounter the appearance of camera shake.

Use a tripod or other forms of camera stabilization to avoid camera shake when shooting at slower shutter speeds.
ISO:

- ISO is the level of sensitivity of your camera to available light
- The more light available, the lower the ISO needs to be.
- Using a higher ISO means the camera has less light to work with and could introduce ‘noise’ or ‘grain’ into the photograph.
**Camera Modes**

**Manual Mode** is the best shooting mode if you like to have full creative control over your image. The photographer makes all of the decisions related to the image.

**Automatic Mode** is the best shooting mode if you don’t want to think too hard about the image you’re producing. The camera makes all of the decisions related to exposure.

Use the shooting mode that fits your shooting style
- There are times where the photographer doesn’t have enough time to address Aperture, Shutter Speed, and ISO. If the question becomes, “Should I shoot in manual mode so I avoid looking like an amateur? Or should I shoot in automatic mode to capture the moment?”, the answer is that the moment is more important. Shoot in a way that produces a better image. A good example of this is at a surprise party. Don’t sacrifice moments in favor of “looking” more professional.

**Aperture Priority Mode**
Usually abbreviated $A$ or $Av$ (aperture value), this setting is a compromise between fully manual and fully automatic. This setting allows you to specify the f/stop/aperture while the camera compensates for the exposure using the shutter speed. This setting is usually used while shooting portraits, as the photographer wants to isolate the subject from the background.

**Shutter Priority Mode**
Usually abbreviated $S$ or $Tv$ (time value), this setting, like aperture priority, is a compromise between fully manual and fully automatic. This setting allows you to specify shutter speed while the camera compensates for the exposure using the aperture.

**Additional Camera Modes**
Some cameras have more shooting modes than others and can often vary in their function from camera to camera. If you would like to know more about the mode settings on your camera, refer to the camera’s operational manual.
**Focal Length**

Focal length tells us the angle of view—how much of the scene will be captured. It’s the distance between the center of a lens or curved mirror and its focus. It is usually stated in millimeters. The images below illustrates this concept.

![Focal Length Illustration](image_url)

LONGER focal length = NARROWER angle of view
SHORTER focal length = WIDER angle of view
**Perspective Distortion**
Perspective distortion is a warping or transformation of an object and its surrounding area that differs significantly from what the object would look like with a normal focal length, due to the relative scale of nearby and distant features. This can include the subtle distance of facial features like the example below.

![Perspective Distortion Images]

It’s typically better to use more telephoto lenses when shooting portraits, and wide angle lenses when shooting landscapes. Keep in mind that the images above are extreme examples.

**Lens Distortion:**
When a lens produces curved lines where straight lines should be. The two most common types of lens distortion are barrel distortion and pincushion distortion. **Barrel distortion** is where straight lines bend outward from the center of the image, which is most commonly observed in wide angle lenses. This effect is most noticeable when shooting scenes where there are straight edges like buildings or interior walls.

![Barrel Distortion and Pincushion Distortion Diagrams]
Resources:

Websites used in class:
Exposure video - https://vimeo.com/41174743
Canon Play - http://www.canonoutsideofauto.ca/play/

Camera Apps:

- Camera+
- Pro HDR

Books:

- Digital SLR cameras & photography for dummies
- Digital photography: an introduction
- Mastering digital photography
- The complete idiot's guide to digital photography
- Digital photography complete course
- The photographer's eye: composition and design for better digital photos

Video Tutorials:

- 3 Tips to Master Exposure Technically and Creatively | Photography 101
  - https://www.youtube.com/watch?v=eAhEatlueXA
- The Three Basics of Exposure and Photography
  - https://vimeo.com/41174743

Other:
Lynda.com (online tutorials with nearly 200 beginner photography lessons)
http://camerasim.com/apps/camera-simulator/

*There are many helpful resources online that are not listed. Simply doing a google search or searching the library catalog for “photography tutorials” will provide an abundance of additional resources.*