

Introduction to Digital Photography



Introduction: Your name, where you work, how did you hear about DOM, any relevant experience, why do you want to learn to shoot video with your DSLR camera?

Purpose of this class: Students will learn the basics of shooting video, capturing audio, designing shots with editing in mind, specific camera settings and features, lighting consideration, and advantages to shooting video with a DSLR. This course will be a mix of lecture and hands-on instruction regarding practical operation and creative possibilities of shooting video with a DSLR Camera. Students do not need any production or video-shooting experience to take this class. Upon completion of this course, students will be able to shoot their own videos, and maximize creative and professional capabilities using a DSLR Camera.

Membership: Membership at DOM has a number of benefits, including access (after certification) to lighting, audio, tripods, and more professional equipment.

Programming Membership - \$ 75.00

One year of access to our encoding kiosks to encode projects to our broadcast server, but no access to Field, Studio, or Editing equipment.

Field Producer Membership - \$ 175.00

The Field Producer Membership is a limited membership package for those who wish to use field equipment, but have no need to use studio or editing equipment.

Studio Producer Membership - \$ 175.00

The Studio Producer Membership is an affordable way to get access to Open Media's two production studios. Designed for studio production crew members who work on a studio crew, but have no need to access field or post-production equipment.

Editor Membership - \$ 175.00

The Editor Membership is an affordable way to get unlimited access to Open Media's cutting-edge post-production suites. Designed for editors who have no need to access studio or field production equipment.

Unlimited Membership - \$ 250.00

The Unlimited Membership is an affordable way to get access to all of Open Media's community resources.

Class Outline:

- *Students find their camera model online and establish the capabilities of that camera.**
- *Establish each student's level and what they'd like to walk out knowing after this class.**

***Student image and camera review - discuss issues.**

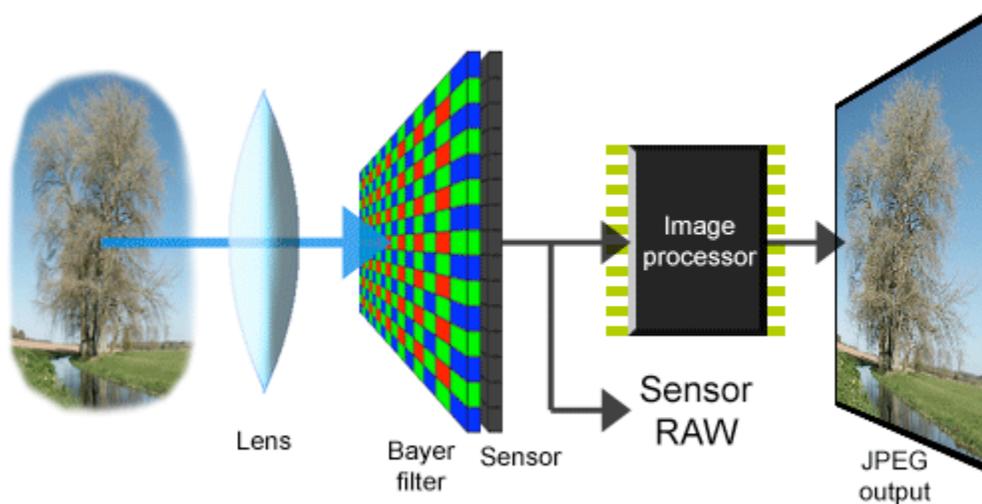
1. Photography basics

How digital capture works:

When you take a picture with a digital camera the light strikes a digital sensor array, instead of a piece of film. The digital sensor is made of millions of tiny sensor points called "pixels," which is short for "picture elements." They are laid out in an array with rows and columns, Think of megapixels as millions of dots of light that are being stored for each picture. The more dots of light there are, the higher the resolution of the image.



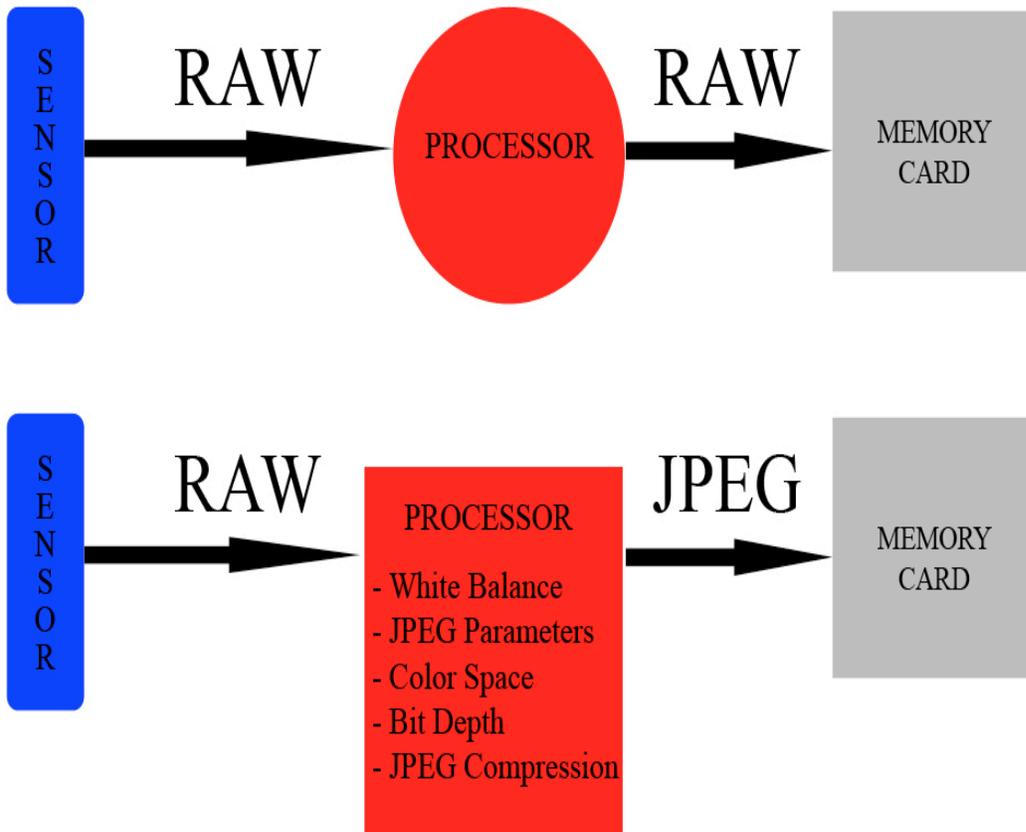
NOTE: *The reason you get better results from a 10megapixel DSLR vs a 10megapixel consumer digital camera is that by have a larger sensor with the same number of pixels, the pixels (really, photosites containing diodes) have to be larger. The larger the pixel, the more light it can gather, the less noise it produces in the image, capturing a greater dynamic range, and giving better performance at high ISOs.*



The most common ways images are capture are either JPEG (Joint Photographic Experts Group) or RAW (a lossless, proprietary image format. Lossless because almost no image data is compressed from the sensor, proprietary because most companies have RAW formats unique to themselves, i.e. Canon = .CR2, Nikon = NEF). If your camera has the option to shoot in RAW, you should use that setting. The images will be larger but since nearly all the information is recorded you have many more options in post production. Think of RAW as the raw image, and JPEG as an image with preset criteria

compressed with it (see image below).

If your camera only shoots JPEG, don't worry! Just understand the difference.

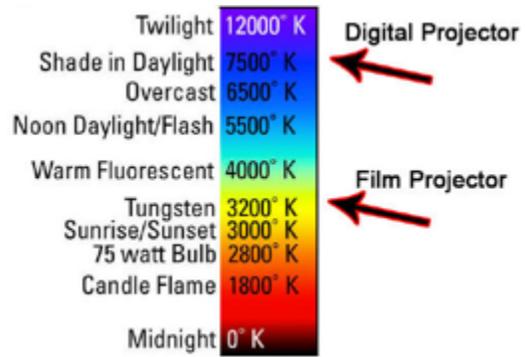


2. Recommended Settings:

a. Color Temperature and White Balance: Different lights have different color temperatures and the camera is much more sensitive to these differences than the eye. Flame, fire or candlelight (orange), household lights (yellow), tungsten, halogen and photoflood (between yellow and green), fluorescents (greenish), sunshine or daylight (blue).

Degrees Kelvin	Type of Light Source	Indoor (3200k) Color Balance	Outdoor (5500k) Color Balance
1700-1800K	Match Flame		
1850-1930K	Candle Flame		
2000-3000K	Sun: At Sunrise or Sunset		
2500-2900K	Household Tungsten Bulbs		
3000K	Tungsten lamp 500W-1k		
3200-3500K	Quartz Lights		
3200-7500K	Fluorescent Lights		
3275K	Tungsten Lamp 2k		
3380K	Tungsten Lamp 5k, 10k		
5000-5400K	Sun: Direct at Noon		
5500-6500K	Daylight (Sun + Sky)		
5500-6500K	Sun: through clouds/haze		
6000-7500K	Sky: Overcast		
6500K	RGB Monitor (White Pt.)		
7000-8000K	Outdoor Shade Areas		
8000-10000K	Sky: Partly Cloudy		

Based on information from the book [digital Lighting & Rendering
Chart and colors (c)2003 Jeremy Bin for www.3dRender.com



b. Resolution settings:

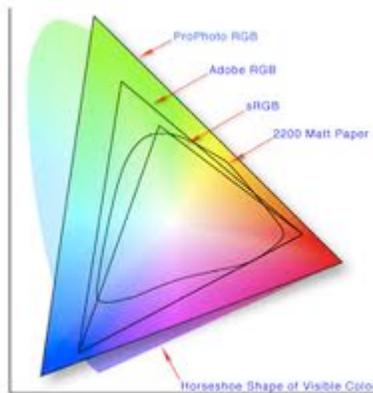
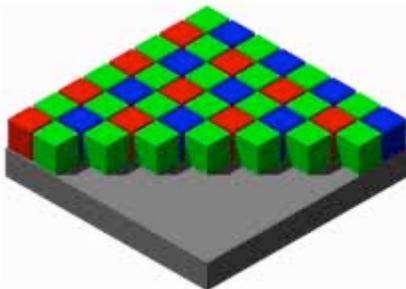
Many digital cameras have differing quality or resolution settings for shooting JPEG. The higher the quality, the better the resolution of the image. It is always recommended that you shoot at the highest quality and then downsize for different uses - web, screen, print, etc.

Web standard: 72 dpi

Print standard: 300 dpi

C. Color Space:

A color model is an abstract mathematical model describing the way colors can be represented as tuples of numbers, typically as three or four values or color components. The model we are dealing with is RGB (Red, Green, Blue). These are the colors that your digital camera sensor captures.



RGB: Used for capture on on screen representation - Red, Green, Blue

CMYK: Used only for printing = Cyan, Magenta, Yellow, Black

2. Digital vs. optical zoom:

In general you will want to use the length of your optical zoom. This means there are physical elements moving in the lens to zoom. Digital zoom is the camera interpolating the existing pixel information to zoom (See image below).

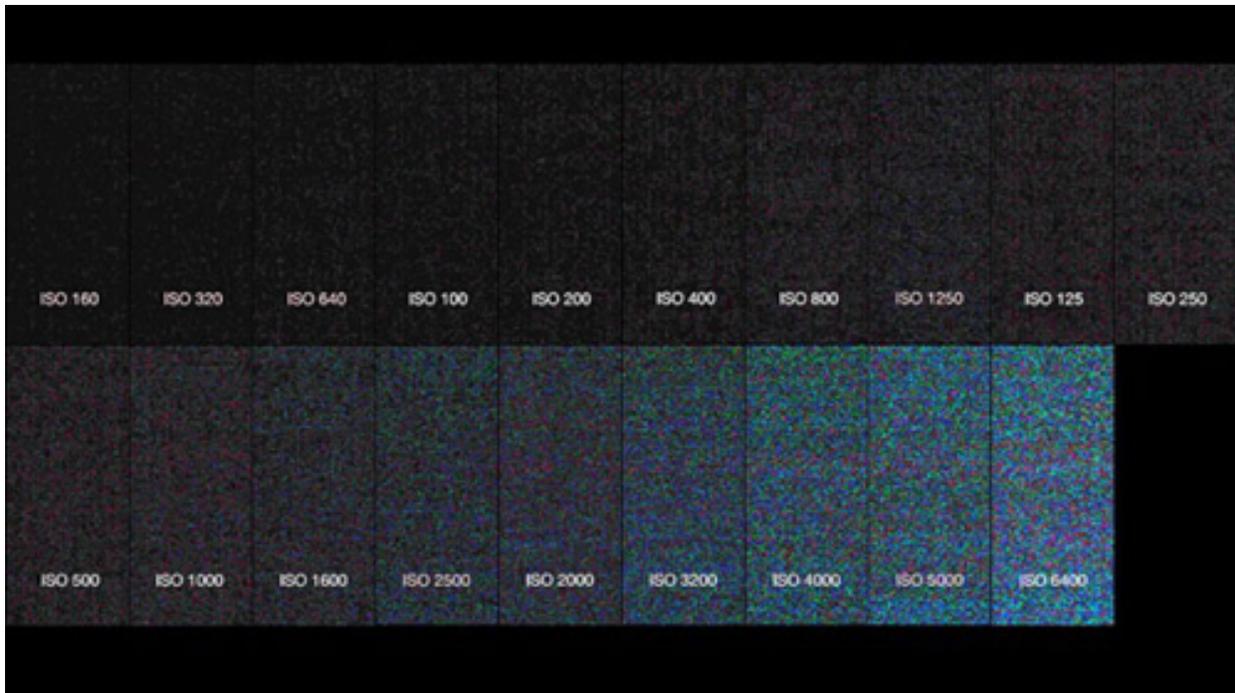


2. Manual, manual, manual: Having said that, it's fine to sometimes use auto (or always use auto if that's your only choice) but at the very least understanding what settings you can control is important. Auto settings tend to try and balance to an optimal image, often sacrificing quality in favor of equalizing exposure. This means that the camera will go to the highest ISO it can in low light settings, adding noise.

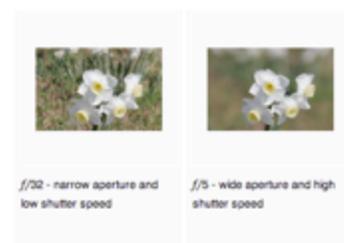
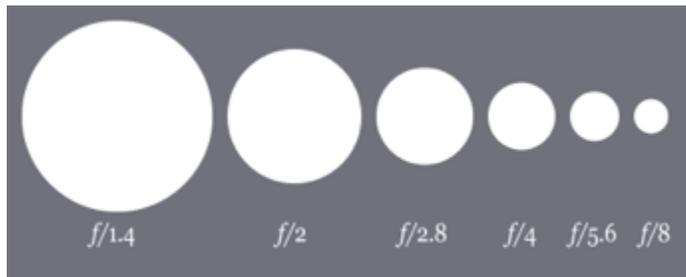
These are the most important settings you should understand:

ISO (aka ASA): Stands for International Standards Organization, based in Switzerland. Relates to the sensitivity of the image sensor, or more accurately, how much light is allowed to pass to the sensor. Film is rated by ISO. The lower the number, the finer the grain. As a rule, for film or video, you will want to shoot at the lowest ISO possible. There are options for correcting this in post production (Lightroom 3, Photoshop, free options, etc.)

Example of
noise:



F-Stop/Aperture: When you open the iris on your camera your picture gets brighter, allowing you to shoot in dimmer conditions, but your depth of field shortens and it is harder to keep your subjects in focus. (Although it seems a bit backwards: the smaller your f-stop setting is (i.e. 1.4), the bigger the opening is (see below.) (PASS AROUND LENS).



Focus and DOF:

As we've covered, focus is extremely important. The strongest tool in the cinematographer's bag of tricks (as far as controlling what the viewer is looking at) is focus. A full-face close-up in sharp focus in the foreground will dominate the audience's attention, diverting their attention from softer, unfocused images in the background. Conversely, a figure in soft focus in the foreground can occupy more than half the frame and yet attract less attention than a smaller figure in the background, proving that focus is more important than the location or size of the object. (*Watch Depth of Field Video*)

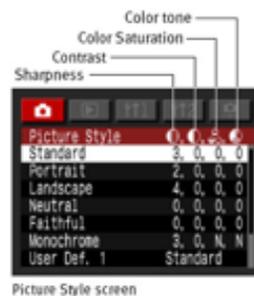
Shutter Speed: Shutter speed is how long the sensor in your camera is exposed to light.



You should always adjust your camera's white balance setting to get the correct color representation, no matter what kind of light you are shooting in. There are pre-sets for indoor and outdoor lighting, and a custom white-balance setting for everything in-between.

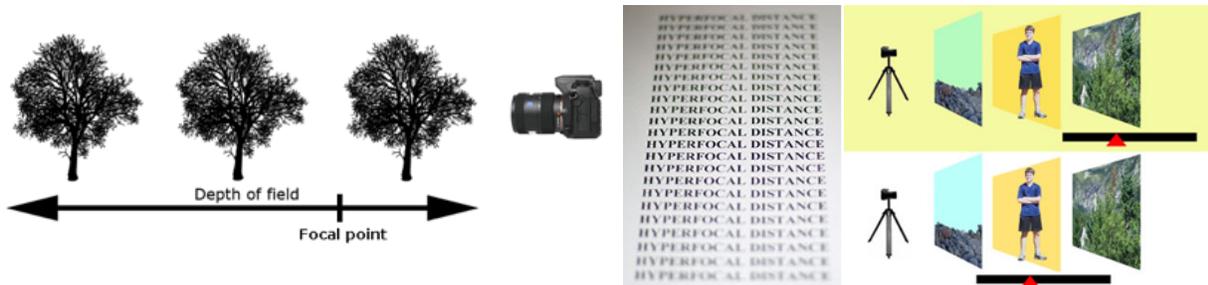
JPEG vs. RAW: When shooting RAW images, the information is captured in a grayscale, which is why you can just push a white balance preset button in your editing software and change it from sunlight to tungsten to flash and back without losing any quality. Avoid AWB, since this will change, but be sure to change it if needed, i.e. you are moving from shooting outdoors in direct sunlight to indoors under fluorescent lights. Bottom line, set your WB correctly to the lighting conditions you are shooting under.

Picture Settings: These are in camera settings that can be set to apply to still images. You will want to start shooting with these "Off," or set to Neutral. This will give you the most control over the look of your image in post production. Then, after exploring the results of difference settings, choose the one you like the best. This is true for JPEG, but not for RAW images.

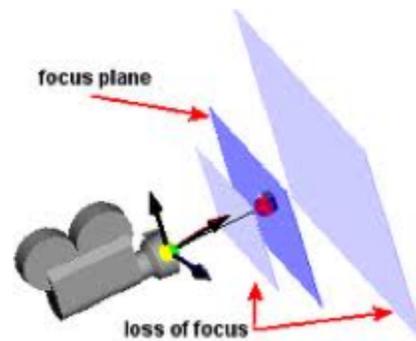
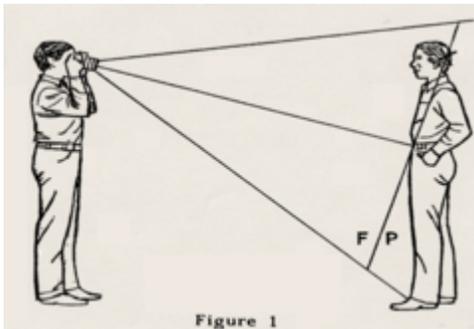


Two Fun (and potentially confusing) Notes:

1. Hyperfocal distance – an equation for determining how to get the maximum field of focus with a given lens. We'll leave it at that – the important part is this, remember that wherever you focus, 1/3 of the field of focus will be in front of the point of focus, and 2/3s will be behind.



2. Plane of focus: The plane of focus is the area that is in focus and is always parallel to the focal plane of the camera.



5. Lighting: You need to consider and to the extent that you can, control, your lighting situation. You always have available light, whether that is from the sun or from artificial lights. After that, you will have on-camera flash, and in some cases be able to add additional flash to your camera. Even if your camera does not have the ability to sync to a flash unit, you can use what's called constant light.

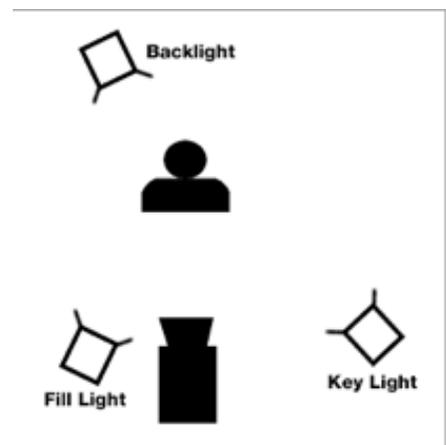
Basic 3-point lighting setup:

o The Key Light: **The primary source of light for your shot.**

This light is used to illuminate your subject. Everything else is used to make your shot look pretty. The key light is a bright light placed on the broad side of the subject's face, usually at eye-level or significantly above and off to one side (which is more what we are used to), so there is some depth and shadows created.

o The Fill Light: A diffused light, dimmer than the key, the fill light is placed on the opposite side of the subject, **filling in the shadows left by the key light** and ensuring the entire subject is properly exposed. (A reflector can also serve as a fill light.)

o The Back Light: A small light, above and behind the subject, shining on the back of their head



and shoulders. The back light casts a glow in the subject's hair and atop their shoulders, which helps to **separate them from the background**.

This is a basic lighting setup and can be used as a guide to lighting subjects other than interviewees, i.e. any subject, animate or inanimate. Light is your friend – get to know it, and use it!

An important asset is a reflector – this can range from a professional reflector, to any thing that is white in color (it's important that it's white so it doesn't add a color cast to your light) including a wall, the ceiling, a piece of Insulfoam (cheap and functional).

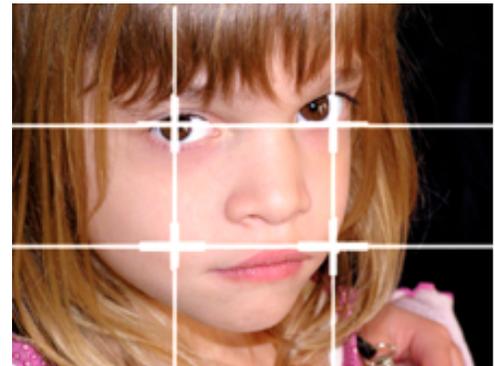


6. Tripods and Monopods: Mechanical image stabilization, in its simplest form, can be as simple as pinning the camera up against a wall or resting your elbows on a table. In its most complex form, it is a crane or a camera jib. The tripod is always your best, most stable option when you don't need to move the camera. A monopod is a cheap, mobile option with one pole that you hold steady yourself as it rests on the ground. A monopod is always better than a hand-held when you don't want an intentionally shaky image. Also, you should make all of your camera movements when the camera is turned off. Even if you want to pan, try instead to take a number of static shots. Like the other points, use this as a starting rule, learn how to use it well and to your advantage and then starting breaking the rule.

Shooting Basics

Rule of Thirds:

When filming people, regardless of the shot (whether a close-up or wide shot) you want the subject's eyes in the top third of the frame. Any shot is aesthetically more pleasing to the viewer when the rule of thirds is followed. If you watch any professional video you'll see the rule of thirds being followed. Not following the rule of thirds will make your video look like amateur work right from the start. **If you only ever learn one thing about cinematography, this should be it.** In an ECU (extreme close-up) the eyes are usually aligned with the top third, and the mouth along the lower-third.



Also, if your subject is looking off to one side or the other, they should be framed off-center such that there is more room in front of their face than behind it. (**Watch Rule of Thirds Video**)

Use of Foreground: Often times while shooting, people will tend to want everything out of the frame except for the subject they are trying to capture. Instead, try to use objects in the foreground to frame your shot, either leaving those out of focus, or having them in focus and the

action behind falling out of focus.

Multiple Angles: Shifting your camera up or down on one side can often create a much more engaging image. When people start shooting they tend to only shoot horizontal or vertical - don't forget there is a huge range between horizontal and vertical.

10. Field trip:

We will now shoot in 2 distinct shooting environments and put to use the shooting guidelines we have discussed in the first half of class.

1. Open Media Foundation
2. Santa Fe Ave.

11. Post Production considerations:

There are many paid, and some free applications, for post production.

Photoshop, Lightroom, iPhoto, and Aperture are among the most popular. Online services, such as Picasa and piknik are also popular, and can be useful.

12. Image review.