Screen Printing Workshop

School of Visual Philosophy

April 2019

## Screen Basics

1. Screen printing is a stencil printing method
2. There are different ways to make a stencil or mask on tightly woven thin fabric that is stretched over a frame.
	1. Block out using **screen filler** (paint the negative area by hand)
	2. Paint a positive image using **drawing fluid** then squeegee **screen filler**, wash out drawing fluid with water to reveal positive image
	3. Paper or vinyl cut stencil
	4. Photo-emulsion (light-sensitive film that can produce a half-tone pattern and high detail that is exposed with light)
3. Images can be simple blocks of color or highly detailed photo-real 4-color processed

## Materials for Photo Emulsion

1. Ulano or Speedball **Diazo** photo-emulsion (don’t expose to UV light)
2. Screens can be purchased at any art store, or screen printing specialty stores like
	1. Blick (simple small screens)
	2. Lenz Art (Santa Cruz)
	3. University Arts (Speedball kit)
	4. GoldUp USA (Oakland and online)
	5. Ryonet (screenprinting.com online)
3. Screen mesh counts range from 80 – 420 (the higher the number, the more threads in the fabric, and the higher the detail you can obtain)
4. Image creation
	1. Draw on mylar or tracing paper with a Sharpie or china marker or touch up photo pen
	2. Print out a transparency halftone from Photoshop (see below)
	3. Pretty much anything that is dense vs. see-through (charcoal on tracing paper, lace, plants, etc.)
5. Paper/transparencies
	1. Clear or frosty mylar for the transparency positive
	2. EPSON Water Proof Screen Positive Film for Inkjet printers (made by **Fixxons**)
	3. Clear transparencies for laser printers (different than Inkjet!)
	4. Multiple types of paper or fabric can be used as a substrate for the final print
		1. Drawing paper
		2. Plywood
		3. Plexiglas
		4. Fabric

## Making a Halftone in Photoshop

## Open your image in Photoshop

1. Resize your image to be the size you will print out- 11x17” maximum
2. Change the image to Greyscale, go to IMAGE – MODE – **Greyscale**
3. Adjust the Brightness/Contrast, go to IMAGE – ADJUSTMENTS – **Brightness/Contrast**
4. Change the image to a halftone-
	1. Choose IMAGE – MODE – **Bitmap**
	2. Choose Method – **Halftone Screen** (with 300 dpi resolution)
		1. Frequency is the Lines per Inch
			1. Your mesh count divided by 3.5, or between 30-60 LPI
		2. For one color, **angle** is irrelevant

## Making a Black and White high contrast image in Photoshop

## 1. Open your image in Photoshop

2. Resize your image to be the size you will print out- 11x17” maximum

3. Change the image to Greyscale, go to IMAGE – MODE – **Greyscale**

4. Adjust the Brightness/Contrast, go to IMAGE – ADJUSTMENTS – **Brightness/Contrast**

5. Change the image to a halftone-

* 1. Choose IMAGE – MODE – **Bitmap**
	2. Choose Method – **50% Threshold** (with 300 dpi resolution)
		1. Adjust the black and white contrast and brightness until you like the way the image looks by hitting **ctrl z** to undo the

## Color Separations in Photoshop

1. Open your image in Photoshop
	1. Image – Mode – CMYK
	2. Image – Image Size – 300 dots per inch (resolution)
2. Flatten your image layers
3. Resize your image to be the size you will print out- max 11x17”
4. Split the channels
5. For each channels’ new file, go to Image – Mode – **Bitmap**
	1. Choose Method – **Halftone Screen** (with 300 dpi resolution)
		1. Frequency is the Lines-Per-Inch
			1. Your Mesh Count divided by 3.5 (80 mesh count is 23 LPI)
		2. Make sure to offset the angle of each channel’s halftone pattern
			1. C – 75 degrees
			2. M – 15 degrees
			3. Y – 105 degrees
			4. K – 45 degrees
		3. Shape should be **Round**
		4. You cannot alter the contrast or gradation once the image is a Bitmap but you can undo the Bitmap and alter the image, then go back to the Halftone screen
6. Save the new channel layers separately (as PSD, JPG, or PDF)
	1. Print each file separately for the different separations
	2. Choose “**print printer’s marks**” in the print dialog box so that your registration hash marks will print, these will be taped over during printing

## Screen Positive Technique

1. Coat Screen with light sensitive Photo Emulsion

 a. Mix Emulsion according to manufacturer’s directions

 b. Apply Emulsion with scoop coater evenly to exposure side of the screen

 c. Let dry in the dark room for 6 hours minimum-maximum a couple months

2. Expose Screen in dark room using light table

 a. Place previously made transparency on glass light table **FACE UP**

 b. Place coated screen frame side up over transparency

 c. Either use a vacuum lid to suck out all the air and ensure the transparency and screen

are in close contact together

d.Expose screen for time indicated on chart (for SVP- 3 ½ minutes for white mesh, 4 min. 15 sec. for yellow mesh

3. Expose screen in dark room using overhead unit (like NuArc)

 a. Lay screen frame side up on the glass

 b. Place transparency right side up on screen mesh coated with emulsion

 c. Place glass on top of transparency in order to weight it down ensuring a tight contact

 between screen and image.

* 1. Turn light on and time for appropriate length- 1 min. 10 sec. for white mesh, 1 min.

30 sec. for yellow mesh

3. Wash out screen

a. Using the lighter nozzle on the pressure washer (about the force of a strong garden hose) start out slow and build strength concentrating the spray on the image area

 b. Make sure to spray both sides of the screen

 c. Keep spraying until all the emulsion is washed out of the image areas

 d. Let completely dry (you can help by leaving in front of a fan)

## Printing Technique

1. Mix colors
	1. You can either mix all colors ahead of time at once, or one by one, but each color should contain enough ink to finish the edition
	2. The colors used in 4 color process are CMYK- Cyan, Magenta, Yellow and Black and are designed to be slightly transparent so the colors can show through each subsequent one
2. Set up screen and paper
	1. Tape off the borders of your screen so there are no holes or voids in the emulsion, otherwise ink can seep through the bare screen
	2. Tape off any imagery that is not intended for the first print
	3. Cut or tear paper for the edition and have at hand, along with several pieces of newsprint for proofing
	4. Place screen in hinged press
3. Mylar registration
	1. Tape a piece of clear Mylar or acetate to the press bed
	2. Spoon out the first ink color the width of the image
	3. “Flood” the screen with the ink and squeegee without dropping it down yet
	4. Lay the screen down and squeegee the ink through the screen onto the mylar
	5. Make sure the screen has sufficient “snap”- the distance between the screen and the press, if not, place cardboard tabs under screen to lift it up
	6. Lift Mylar and place paper underneath in registration
	7. Remove Mylar off to the side (still taped to press bed)
	8. Flood screen and lower screen to paper, squeegee through screen onto paper
	9. Complete each first color before cleaning the screen and moving on to the next color
	10. Wait for the previous color printed to dry to the touch before printing the next color
4. Cleanup
	1. Once the color is printed, take the screen off the press, take to the sink and wash with the low power nozzle until ALL the ink is removed. Use a sponge if necessary to aid with ink removal. Let dry before using again
	2. Wipe off the majority of ink from the squeegee and spoon back into the ink can. Wash the squeegee and spoon or spatula used for ink in the shop sink until COMPLETELY clean. Any ink left to dry will harden and cause the squeegee to print improperly
	3. Wipe off mylar registration with a damp sponge and paper towel.
	4. Put away all ink, presses and materials used and throw away used newsprint
5. Reclaiming the screen
	1. Once the stencil is no longer needed, the screen can be reclaimed by taking it to the wash out sink
	2. Spray or pour the emulsion remover on both sides of the screen
	3. Scrub the screen with the bristle brush and let stand for 1 minute
	4. Use the high power nozzle on the pressure washer to remove the emulsion COMPLETELY from the screen
	5. Any emulsion left on the screen will not allow the screen to print in those areas
	6. Let dry before re-coating the screen