what you should know about

print

put it on paper

intro

The print industry has been under scrutiny in the past few years. Rumors of print being dead and digital media and marketing taking over have been circulating through the graphics world ever since e-commerce came to fruition. Print is anything but dead! The print industry has had to change and evolve quite substantially over the last few years, but printed marketing materials are still an integral facet of marketing.

Most printed marketing materials have been processed in a print shop, small or large. Direct marketing campaigns will almost always need to be done through a print lab in order to ensure that color matching, document size and overall quality are up-to-snuff for clients. Simply running a publisher file through an inkjet printer is not going to cut it – especially if the quality of the output is important! A print shop has the expertise and the equipment to bring marketing materials to life.

If you are interested in learning more about the modern print industry and the process involved in transforming digital files into marketing materials, this booklet is for you.

The first thing a graphics professional needs to know about print is how to set up and create a file intended for press.

A large digital press – sometimes several – will process a file and translate it to a printed page. A typical sheet size for a standard digital press is 12" x 18".
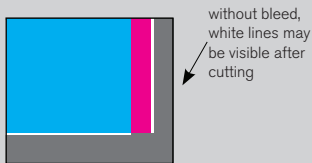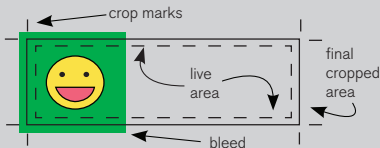
A file will be imposed (fit) onto a spread this size and duplicated as many times as possible without being printed off the page.

Ex: An 8.5" x 11" flyer will be imposed two times on a 12" x 18" sheet. This enables a desired quantity of 20 to be printed on only 10 sheets of press stock, saving time and money.

Files with an image or color that extends to the very edge of the page needs something called 'bleed'.

Bleed: A small margin extending beyond the original dimensions of the file that will essentially be cut off in the post-production process.

Bleed helps prevent the blank areas of the press stock from showing when the flyers are cut down. For an example, see the images below:

crop marks

live area

final cropped area

bleed

without bleed, white lines may be visible after cutting

The black lines coming together at a right angle at the edges of the pages are crop marks – the lines that a production specialist will use to trim a document.

The cutter uses 3,000 lbs. of pressure, which means that a given document can be nudged slightly during a cut.

Without necessary bleed, there is no buffer zone of ink to negate the nudge of the cutting blade. A small strip of paper without ink can sometimes appear along the edge of the document as a result.

Conclusion// If a flyer has colors or images that extend to the edge of the page, it needs bleed!

What software is recommended for printed media creation?

Most graphics professionals prefer Adobe Photoshop, Illustrator, InDesign, etc.

QuarkXPress is another industry-standard software created specifically for desktop publishing.

Adobe products tend to be easier to work with, especially if they are readily available.

At the ASU Print & Imaging Lab, Adobe InDesign is the primary software used for file creation and imposition.

Bleed settings are different across applications.

Adobe Illustrator or InDesign allows bleed to be added to a document in the initial file creation dialogue box.

In Photoshop or any other image manipulation or drawing program, it is necessary to add the bleed into the document size.

Ex: An 8.5" x 11" document that requires bleed should be designed as an 8.625" x 11.125" document.

Conclusion// Adobe products are a little easier to work with for beginners.

PPI

For a printed output, it is always important to think about the photo's PPI (pixels per inch), in relation to its size.

The larger the photo, the higher the PPI should be.

A large image with low PPI increases pixel visibility and image distortion.

An appropriate PPI for printing an image is 300, meaning 300 pixels will be printed in every square inch of the photograph.

If a 1200 x 1200 pixel image is printed at 300 PPI, the image will be produced as a 4 x 4 inch document.

Conclusion// If you want a larger size of an image printed at 300 PPI, make sure the pixel size of the original digital image is large enough to accommodate this.

In addition to PPI, DPI is an important term in a print shop.

DPI (dots per inch): Refers to a printer's ability to recreate an image with ink.

Cyan, Magenta, Yellow and Key (black) colored dots are printed to recreate the pixel hues seen in a digital image.

DPI is a technical aspect of a printer, like the screen resolution of a smart phone.

Better printers have higher DPI's, which increases the quality of the gradation and tone of a printed image.

Conclusion// Good PPI correlates directly with the file size of an electronic image, and is measured in pixels. DPI is a measurement of the number of ink dots per inch for a given printer.

raster VS. vector

Graphical elements like photos and clipart are created using pixels, which means they are raster-based elements.

Stretching raster elements past native resolution (maximum size) results in quality loss.

If the image is scaled down, the quality can remain unchanged so long as the PPI is increased.

Use Photoshop, Paint, Word or Publisher for file creation.

For a high-quality flyer, don't scale anything raster-based!

Vector elements are created using mathematical calculations, ensuring that the integrity of their shape and quality will remain intact no matter how large or small they are scaled.

Create vectors with Adobe Illustrator or InDesign.
Photoshop can also be used, but in very limited ways.
Ex: Photoshop Smart Objects or the Pen tool

Conclusion// Photoshop for raster images, Illustrator or InDesign for vector images.

color

Printers use a combination of four inks to reproduce color on a printed page.

These four colors are Cyan (C), Magenta (M), Yellow (Y) and Key (K, or Black).

The CMYK color model is known as a subtractive color model.

White light illuminating the print is absorbed in various degrees by each of the inks.

Whatever portions of the white light are absorbed by the inks printed on the paper, the remaining light is reflected back to the viewer, resulting in the appearance of color.

Ink Color	Absorbs	Reflects	Appears
C	Red Light	Green & Blue Light	Cyan
M	Green Light	Red & Blue Light	Magenta
Y	Blue Light	Red & Green Light	Yellow
M + Y	Green & Blue Light	Red Light	Red
C + Y	Red & Blue Light	Green Light	Green
C + M	Red & Green Light	Blue Light	Blue

The color model used in electronic formats (such as a computer screen) is known as the RGB (Red, Green and Blue) color model.

The RGB color model is known as an additive color model.
Red, green and blue lights combine to create cyan, magenta, yellow and finally white, when all three lights are combined.

CMYK and RGB color spaces translate differently between a computer screen and a printer.

RGB looks great digitally, but not on paper.

This can often lead to some severe discoloration issues in output if the color profile is not converted.

This image demonstrates the hue variation between profiles:

RGB   CMYK

Conclusion// Use an RGB color profile for digital content. Use CMYK for print.

Pantone is a privately-owned corporation known for the Pantone Matching System (PMS), a color matching system that allows color consistency across devices and throughout the printing process.

This system requires specified printer inks that a commercial printer uses to hand-mix the appropriate PANTONE color.

PANTONE colors – also known as "spot" colors – are separate from CYMK and must be mixed independently from the cartridges in the printer.

The inks must be installed separately and often require a special naming convention (callout) that will be read properly by the digital press.

Ex: If a document uses PANTONE 208, that element must be created with PANTONE 208C (coated paper) or PANTONE 208U (uncoated paper).

The press needs to have the corresponding ink installed.

The press will use the PANTONE ink mixture only on elements that are named correctly.

PANTONE colors must be ordered for the digital press, and cannot be built using CMYK methods.

Another topic worth covering – at least briefly – is dot gain.

Printers use small halftone dots to reproduce color during the printing process.

Sometimes these halftone dots grow slightly larger than their intended size, either due to the quality of the paper or the precision of the printer's ink distribution.

Dots will then run together, decreasing contrast in tonality, and making the final image appear darker than it should.

Most printing companies will know the dot gain percentage of their primary presses, and will make corrections as needed during gamut conversion.

To account for dot gain during file creation, increase the midtone brightness of the image in an image editor.

Photoshop can also embed a color space specifically for dot gain correction at various percentages.

ASU brand

When creating or reproducing printed marketing materials that advertise an Arizona State University event, the ASU Communication Guide standards must be adhered to. This guide is located online at:

commguide.asu.edu/

ASU has specific parameters in place regarding proper logo, font and color usage. When utilizing these elements, the established standards must be followed properly, or the piece cannot be reproduced.

Logo Usage

The ASU logo and word mark can only be used by ASU faculty, staff, University units and corresponding organizations.

In print, the smallest the logo can be is 5/16".

For digital use, the logo must be at least 47 pixels wide.

There must be a proper "area of isolation" around the logo.

This area is essentially a margin that wraps the entire logo.

To determine the appropriate "area of isolation" for the chosen logo size, take the logo's current height, divide it by two, and use that measurement.

Ex: If the ASU logo on a flyer is an inch high, a margin of ½ inch should wrap around the entire logo.

Color Palette

When sampling ASU-specific colors for printed material, the proper CMYK callouts must be used.

The tables below give both primary and secondary color palette CMYK values.

CMYK 60, 40, 40, 100	CMYK 0, 21, 88, 0	CMYK 10, 97, 37, 43	CMYK 0, 0, 0, 0
CMYK 64, 5, 100, 24	CMYK 0, 52, 80, 0	CMYK 84, 21, 0, 0	CMYK 10, 13, 16 29

Font Usage

The official font of Arizona State University is Akzidenz-Grotesk Pro.

This font is used on every piece of marketing material the University produces.

When used as a design element, some restrictions do apply:

Only some structures of the typeface are allowed for various types of text.

Lower-case font should be used when typing expressions, with the exception of proper nouns, legal entities and quotes.

paper

In the printing industry, paper is everything! Knowing the appropriate stock for a specific project is very useful and can save money in the long run.

In commercial printing, there are two types of paper: coated and uncoated.

Coated Stock

Coated stocks are treated with a surface sealant that makes them less absorbent and susceptible to the environment.

Lower absorption decreases overall dot gain.

Coated stocks have three possible finishes to them: gloss, dull or matte.

> Gloss – has a high sheen to it. Uses: Brochures, catalogs, flyers, mailers, posters, postcards, rack cards, etc.

> Dull – not completely matte, but not glossy. Uses: Brochures, leaflets, flyers, etc.

> Matte – no sheen, no gloss and usually more expensive. Uses: Booklets, inserts, pamphlets, invitations, etc.

Uncoated Stock

Uncoated Paper - An uncoated stock has not been coated with surface sealants or any other finish.

The lack of coating usually increases visible dot gain.

> Uses: Business cards, rack cards, letterhead, newsletters, copies, etc.

Paper Weight

The weight of a paper is determined by its thickness.

The thicker the paper, the higher its weight.

The weight of paper is unique to its type.

> Ex: 80# Text is thinner than 65# Cover.

Paper weight is often measured in pounds, which is designated by a pound sign (#).

> Ex:100# Uncoated Cover.

Text Paper – Text-weight paper is thinner than cover stock, but thicker than a traditional copy stock.

Cover Paper – This type of paper is much thicker than other varieties. It is also known as card stock.

jargon

Bleed // Any element that extends up to or past the edge of a printed page.

CMYK // Cyan, Magenta, Yellow and Key (Black). These four colors are used as part of the subtractive color model. Used specifically by printers.

Color Space // The entire range of hues possible to reproduce on a specific system, such as a computer screen or four-color printing press.

Crop Marks // Small black printed lines around the edges of a printed piece indicating where it is to be cut out of the sheet. Sometimes referred to as cut marks.

Dot Gain // A term used to describe when dots are printing larger than they should.

DPI // Dots per inch. Refers to the number of dots per square inch that a printer is capable of producing on paper.

Finish // The surface quality of a paper.

Halftone // Using small dots to produce the impression of a continuous-tone image. The effect is achieved by varying the dot size and the number of dots per square inch.

Imposition // The correct sequential arrangement of pages that are ready to be printed, along with all the margins in proper alignment, before the file is sent to press.

Offset Printing // The most commonly used printing method, where the printed material does not receive ink directly from a printing plate but from an internal blanket that receives the ink from the plate and then transfers it to the paper.

PANTONE // A color produced for the Pantone Matching System. Specified ink must be mixed, installed and printed independently of CMYK inks.

PPI // Pixels per inch. Refers to the number of pixels per square inch found in an image.

Proof// A preliminary example of the layout and artwork for a specific printing job.

RBG // Red, Green and Blue light. This is an additive color model used in the reproduction of color viewed on electronic backlit screens.

Substrate // The material onto which the print ink is ultimately applied, such as paper, canvas or cloth.

sources

http://www.pantone.com
http://commguide.asu.edu
http://www.pressproof.com
http://www.printingforless.com
http://www.rgbworld.com/color