GCSC

Graphic Communications
Skills Competencies

Digital File Preparation and Output

Knowing and executing the steps needed to prepare a client file, from preflighting through platemaking is essential for the production of a successful printing project. It is important to assure files are well managed and proper image resolution and color spaces are chosen. Also, careful attention to consistent color matching and an efficient layout of pages on the press sheet are vital for correct production to any output device.

Software brand names are included for reference or example only. The listing of names is not meant to be an endorsement.

The course is segmented into ten Subject Areas:

- A. Type
- B. Page Layout and Design
- C. Image Capture and Editing
- D. Illustration
- E. PDF
- F. Prepress
- G. Color Management
- H. File Systems and File Management
- I. Digital File Output
- J. Math and Measurement

A. Type

Type can be the most important element placed on a page. There are many different visual aspects of using a particular style of type, which can set the mood, draw attention or highlight critical information. Many technical issues can occur when including a particular style of type, which if not addressed can alter the final look of the printed piece.

The following competencies define the different classifications of typestyles and the different ways that type can be arranged on a page.

1) Discuss the role of type as a design element in graphic communications
2) Compare the physical characteristics of basic type classifications
    a. Serif
    b. Sans Serif
3) Identify the physical characteristics of type classifications

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        a.   Bold
        b.   Italic
        c.   Roman

4) Identify the physical characteristics of typographic characters
   a. Uppercase
   b. Lowercase
   c. Small Caps
   d. Ligatures
   e. Glyphs
   f. Subscript
   g. Superscript
5) Identify typographic ems and ens and their associated dashes
6) Explain the use of points and picas as measurement increments
7) Identify the physical characteristics of type
   a. X-Height
   b. Mean-Line
   c. Baseline
   d. Ascender
   e. Descender
   f. Leading (spacing)
   g. Tracking
   h. Kerning
8) Compare display (headline) type and body (text) type by their point sizes and type styles
9) Recognize text alignment
   a. Flush Left
   b. Flush Right
   c. Center
   d. Justify
10) Compare the differences of typeface technologies
    a. TrueType
    b. PostScript Type 1
    c. Open Type
11) Describe font substitution when outputting a printed page
12) Assess the effectiveness of a communication piece using different applications of type

B. Page Layout and Design

The placement of various elements onto a page can include type, graphics or illustrations. These are the essential components of any page layout.

The following competencies discuss the process of using page layout software to create pages that will print correctly. In the case of a multi-page document, consistency is also a primary consideration.

13) Review professional Page Layout software applications
   a. Adobe InDesign
   b. QuarkXPress
   c. Microsoft Publisher
14) Review office/home-based software applications
   a. Microsoft Office (Word, PowerPoint)
   b. Google Docs
15) Demonstrate use of computer menus, shortcut keys, and panels in an instructor specified page layout software
16) Create a multi-page document using
   a. Number of pages
   b. Facing pages
   c. Page size and orientation
   d. Columns
   e. Margins
   f. Bleeds
   g. Slugs
17) Utilize page layout software to place text from a word processed file into a multi-page document
18) Demonstrate the use of a digital dictionary and spell checker
19) Demonstrate changing type attributes using
   a. Font
   b. Size
   c. Style
   d. Color
20) Demonstrate changing type alignment attributes
   a. Flush Left
   b. Flush Right
   c. Center
   d. Justify
   e. Justification (top, center, bottom justified),
21) Demonstrate instructor specified paragraph formatting to text
   a. Indents(left, right, hanging)
   b. Spaces before and after,
   c. Line spacing
   d. Drop caps,
   e. Tabs
   f. Object alignment and distribution.
22) Describe page break
23) Describe widow and orphan formatting
24) Demonstrate line break formatting including hyphenation, widow and orphan control
25) Assess proper line and page breaks including hyphenation, widows and orphans in an instructor specified page

26) Describe master pages
27) Explain automatic folio numbering
28) Explain the purpose of style sheets
29) Identify masthead (header and footer)
30) Create a multiple page document using master pages, automatic folios, styles (character, paragraph, and object styles), masthead, and graphics
31) Describe the use of a table in a page layout software
32) Create a document that includes tables
33) Explain the use of a graphic box in a page layout software
34) Explain the use of color tint fills
35) Create a document using an instructor specified color tint fill
36) Plan the steps of preflighting, proofing (hard and soft), packaging all files, and creating an output-appropriate PDF
37) Define variable data printing
38) Discuss the use of variable data in a printing project
39) Create a flat database with three categories in a spreadsheet application for use in a variable data project
40) Design a document that has variable data fields for text and pictures using page layout software with variable data capabilities
41) Produce a variable data printing job on a digital press or production printer

C. Image Capture and Editing

The formation of a graphic requires either photographing an original, or creation from scratch on a computer. Once the original is in a digital format, the graphic can be manipulated with image editing software.

The following competencies define the different types of graphics, how they are created and how they are manipulated to change their visual appearance.

42) Review professional Image Editing software applications
   a. Adobe PhotoShop
43) Demonstrate use of computer menus, shortcut keys, and panels in image editing software
44) Identify different types of graphics
   a. Line art
   b. Vector
   c. Raster
   d. Continuous tone
45) Compare examples of various graphic file formats and their extensions
   a. TIFF (Tagged Image File Format)
   b. EPS (Encapsulated PostScript)
   c. BMP (Bitmap)

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      d.   PSD (Native Adobe PhotoShop)

      e.   JPG (Joint Photographic Experts Guild)

      f.   AI (Native Adobe Illustrator)

46) Explain Pixels Per Inch Resolution (Display)

47) Explain Dots Per Inch (Output device resolution)

48) Explain Lines Per Inch Resolution (Halftone)

49) Discuss minimum resolution requirements for different reproduction devices

      a.   Screen display

      b.   Digital Press

      c.   Offset Press

      d.   Wide Format Inkjet Press

50) Identify potential quality issues of improper relationships of Pixels per Inch (PPI), Dots per Inch (DPI) and Lines per Inch (LPI) on final output quality

51) Describe color bit depth

52) Create correct depth and resolution files of line art and continuous tone images using a scanner

53) Describe various camera components and settings used while capturing images

      a.   Aperture

      b.   Shutter speed

      c.   Image resolution

      d.   White balance

54) Download a digital image from a stock photography web site; resize and resample according to specifications

55) Discuss RGB (Red, Green, Blue) additive color model

56) Discuss CMYK (Cyan, Magenta, Yellow, Black) subtractive color model

57) Discuss spot color model (Pantone)

58) Describe the use of layers, selections and channels in an image editing software program

59) Use layers, selections and channels to edit a color photograph in an image editing software program

60) Describe image cloning

61) Use an image editing software program to perform image cloning

62) Describe unsharp masking

63) Use an image editing software program to perform varying degrees of unsharp masking

64) Review capabilities of adjusting contrast (tone reproduction) in an image editing software program

65) Use an image editing software program to perform contrast adjustments (tone reproduction) on a color image

66) Review capabilities of adjusting color balance (gray balance) in an image editing software program

67) Use an image editing software program to perform color balance (gray balance) adjustments on a color image

68) Explain the use of Optical Character Recognition (OCR)

69) Use Optical Character Recognition (OCR) software to capture printed text

D. Illustration

A vector illustration consists of a computer generated graphic that is a series of mathematical equations. Because of this method of construction, a vector illustration can be highly manipulated and can be enlarged without loss of quality.

The following competencies describe the use and manipulation of vector based graphics.

70) Review the capabilities of professional illustration software applications
   a. Adobe Illustrator
71) Demonstrate the use of computer menus, shortcut keys, and panels in illustration software
72) Describe the differences between a bitmap and a vector graphic
73) Create a single color vector graphic
74) Create a vector graphic to include tints, fills, strokes, and color
75) Create a vector graphic using manipulated type
76) Convert a bitmap image to a vector
77) Edit an existing piece of vector art

E. PDF

The Adobe Portable Document Format (PDF) has caused a major change in the workflow process of the graphic communications industry. A properly prepared PDF file contains all of the elements required to print properly.

The following competencies defines the role of the PDF in a graphic arts workflow, the creation of a PDF file and the editing options of a PDF file.

78) Discuss the Adobe Portable Document Format (PDF)
79) Determine the benefits of using a PDF format within the graphic communications industry
80) Evaluate various methods to create PDF files
81) Discuss PDF/x standards
82) Identify the differences among PDF/x standards
83) Describe appropriate PDF creation settings
   a. Resolution
   b. Page Size
   c. Fonts inclusion
84) Demonstrate how to make changes to an existing PDF file

F. Prepress

Checking incoming files for any errors and assembling individual pages into a larger press sheet layout are key prepress functions.

The following competencies discusses the skills, essential technical workflows and roles and responsibilities of prepress personnel.

85) Describe a job ticket/docket
86) Describe job specifications from a job ticket/docket
87) Discuss the steps of preflighting a print file
88) Identify common quality issues that are found during preflight process
89) Create a manual checklist of possible quality issues
90) Perform a preflight of a PDF file using a manual checklist
91) Perform corrections to problems found during preflight process
     a. Page size incorrect
     b. Font substitution
     c. Bleeds missing
92) Discuss the use of trapping an image for print
93) Describe software options for creating traps
94) Choose the proper amount of trap to apply to a digitally created page using page layout, illustration, and/or trapping software
95) Identify imposition styles
     a. Sheetwise
     b. Work and Turn
     c. Work and Tumble
     d. Multiple Up
     e. Perfecting
96) Demonstrate how to impose an electronic file using digital imposition software
97) Describe a folding dummy for print
98) Create a folding dummy for a 16-page job with proper pagination, fold, and guide marks

G. Color Management

Handling color differences of different output devices to confidently predict the colors a system ultimately produces is the role of color management. There are many technical considerations that are essential when preparing a color file for output.

The following competencies defines the role and workflow processes of color management in a production workflow.

99) Discuss the role of color management in a print workflow
100) Describe color management techniques used in different steps of a print workflow
     a. Monitor

        b. Proofer
        c. Digital Press
        d. Offset Press
        e. Wide Format inkjet Press

101) Compare color gamut capabilities of devices used in a print workflow
        a. Monitor
        b. Proofer
        c. Digital Press
        d. Offset Press
        e. Wide Format inkjet Press

102) Describe an International Color Consortium (ICC) profile

103) Explain the use of an ICC profile in a print workflow

104) Create International Color Consortium (ICC) color profiles

105) Describe conversion limitations of Red, Green, Blue (RGB) color model to Cyan, Magenta, Yellow, Black (CMYK) color model

106) Demonstrate conversion of an RGB image to CMYK using ICC profiles in an image editing software

107) Describe Undercolor Removal (UCR)

108) Demonstrate the use of proper settings for Undercolor Removal (UCR) in an image editing software

109) Describe Gray Component Replacement (GCR)

110) Demonstrate the use of proper settings for Gray Component Replacement (GCR) in an image editing software

111) Define proofing
        a. Hard
        b. Soft

112) Create proof using an appropriate ICC profile and explain why profile is used

113) Demonstrate calibration of a color monitor to manufacturer's specifications

114) Demonstrate calibration of a color proofer to manufacturer's specifications

H. File Systems and File Management

File management describes the fundamental methods of naming, storing and handling files. Within the graphic communications industry, there are a variety of strategies and tools available to efficiently store and retrieve files.

The following competencies describe the common file management processes used in a printing company prepress area.

115) Describe computer networking within a work environment

116) Demonstrate transfer of files within a network

117) Describe font management procedures on a computer workstation

118) Discuss procedures for organizing and managing fonts on a workstation

119) Demonstrate font management procedures on a computer workstation
120) Demonstrate a file back up
121) Discuss disaster recovery file back up options
122) Describe file storage/transfer devices
   a. CDRom
   b. DVD
   c. Flash Memory (USB)
   d. Tape
   e. External Hard Drive
   f. Networked backup drives
   g. Offsite cloud backup
123) Demonstrate the use of a file compression utility for file storage or transfer
124) Describe metadata
125) Discuss the importance of metadata in managing media files
126) Use metadata for digital asset management

I.   Digital File Output

Preparing a file for output to a digital press versus an offset press requires different techniques. In the case of an offset press, a plate must be made that will be mounted to the plate cylinder of the press. A digital press does not require a plate.

The following competencies discuss the common workflow steps of preparing a file for output and the equipment used.

127) Describe a Raster Image Processor (RIP)
128) Identify the features and functions of a Raster Image Processor (RIP)
129) Compare direct to plate versus direct to press
130) Describe the characteristics of plate material for offset printing
   a. Paper
   b. Plastic
   c. Metal
131) Describe the capabilities, specifications and functions of a platesetter
132) Demonstrate calibration of a platesetter to manufacturer's specifications
133) Create a flowchart of workflow steps when outputting to offset press
134) Create a flowchart of workflow steps when outputting to digital press
135) Describe print queue
136) Explain how print queues can be optimized by a digital press operator
137) Identify quality control marks
   a. register marks
   b. trim marks
   c. fold lines
   d. color bars

e. plate control

138) Explain tone value increase (TVI) and its impact on printed materials

139) Demonstrate outputting a file to a digital device

140) Discuss quality control measurement devices
   a. Densitometer
   b. Colorimeter
   c. Plate readers
   d. Spectrophotometer

141) Discuss print shop quality process control Standard Operating Procedures (SOP)

142) Review safety considerations when using computer-to-plate, digital production printer or digital press

143) Describe Safety Data Sheets (SDS)

144) Describe industry workflow automation guidelines
   a. International Cooperation for Integration of Processes in Prepress, Press, and Postpress (CIP4)
   b. Job Definition Format (JDF)

145) Describe print industry specifications
   a. Web Offset Publications (SWOP)
   b. Specifications for Newsprint Advertising Production (SNAP)
   c. General Requirements for Applications in Commercial Offset Lithography (GRACol)
   d. Flexographic Image Reproduction Specifications and Tolerances (FIRST)

J. Math and Measurement

The use of math and measurement skills is critical in a wide range of job functions within the graphic communications industry. Because of the many units of measurement only used in the graphic communications industry, it is important to be able to work with them.

The Math and Measurement application competencies were designed to reinforce math skills necessary for successful employment within the graphic communications industry.

146) Measure a Helvetica typeface in points using the appropriate measuring tools

147) Solve division of decimal problems—two and three digits
   - *Convert 30 inch length to Points*
   - *Calculate monthly cost of software that is leased for $263.00 per year*

148) Solve decimals to percent conversion problems
   - *Calculate total number of blank pages in 300 page book if 84 percent are printed*

149) Solve basic linear measurement problems
   - *Calculate the number of inches in a poster that is 2.4 feet long*