Appendix K

ARTS, A/V TECHNOLOGY AND COMMUNICATIONS YOUTH APPRENTICESHIP

PRINTING TECHNOLOGY PATHWAY GRAPHIC DESIGN AND PRE-PRESS (UNIT 3)

Unit 3: Printing Technology Pathway
Graphic Design and Pre-Press

Competency

1. Study effective design elements

Performance Standard Condition

Competence will be demonstrated

at the worksite OR in the classroom in a simulate setting. Simulation should ONLY be used IF there is no possibility of skill performance at the worksite.

Performance Standard Criteria

Performance will be successful when learners:

Locate successful examples of effective design
Interpret the individual components of the design
Examine the basic visual elements of the design
Compare common visual design layouts and their design elements to intended purpose-logos, brands, posters, magazines, package designs, ads, annual reports, websites
Discuss with worksite professional features that account for a design's effectiveness

Learning Objectives

Define graphic design
Discuss the process and phases of designing
Identify the basic principles of design (i.e., unity; contrast; proportions; balance; emphasis; and, rhythm)
Identify the basic elements of design (i.e., line; shape; direction; size; texture; value; and, color)
Explain the purpose of a Graphic Standards Manual
Discuss the impact of visual communication
List main design styles in history
Demonstrate an understanding of corporate identity including how branding affects consumer recognition
Evaluate the integration of concept and visuals in poster design
Explain how type and visuals communicate to magazine viewers
Discuss the purpose of package design
Analyze the use of form and function requirements for packaging design
Discuss "green" ideas in package design
Study the role of content, design, and information architecture in web design

Comments:

Unit 3: Printing Technology Pathway
Graphic Design and Pre-Press

Competency

2. Analyze a job ticket

Performance Standard Condition

Competence will be demonstrated

at the worksite

Performance Standard Criteria

Performance will be successful when learners:

Obtain a copy of the job ticket

Study the customer specifications and customer supplied files

Review job components

Identify the required job components

- Fonts
- Graphics
- Image
- Transparencies
- Size
- Hard mechanicals
- Printing requirements

Select the design the elements to be incorporated into the final print job product keeping in mind the printing requirements

Learning Objectives

Explain the purpose of the job ticket

Describe different parts of a printed product

Identify and list print markets and types of print businesses

Describe what happens in a graphics and pre-press department

Describe how all print departments work together to complete a print job

Compare capabilities, productivity, and quality of high-end output versus low-end output

Explain the impact of print requirements to design

Comments:

Unit 3: Printing Technology Pathway
Graphic Design and Pre-Press

Competency

3. Use graphics and/or pre-press software

Performance Standard Condition

Competence will be demonstrated

at the worksite

Performance Standard Criteria

Performance will be successful when learners:

Access software
Manipulate computer commands, codes, menus to perform job tasks
Retrieve, copy, edit, save, and print files as required
Demonstrate appropriate save and export techniques
Use file compression for file transfer or storage

Learning Objectives

Discuss the use of software in graphic design and in pre-press
ID the various types of jobs that can be designed and produced using desktop publishing
Identify professional prepress software applications and uses, including: page layout (QuarkXPress, InDesign); image editing (Photoshop); illustration (Illustrator); Portable Document Format (PDF) generation and editing (Acrobat, PitStop); and, imposition (Preps).
Describe the disadvantages of using office/home-based software for professional graphic purposes
Demonstrate the process of importing, placing, and manipulating text and images

Comments:

Unit 3: Printing Technology Pathway
Graphic Design and Pre-Press

Competency

4. Maintain project, image, photo, and/or illustration files

Performance Standard Condition

Competence will be demonstrated

at the worksite

Performance Standard Criteria

Performance will be successful when learners:

Screen customer supplied files for viruses, font usage, image format, etc
Select appropriate forms/records
Create working files
Code documents as required
Manage incoming and outgoing media/materials
File forms/records in appropriate location
Retrieve and replaces files in correct position
Use appropriate computer codes, formatting, macros, charts, spreadsheets, etc.
Verify data prior to entry/storage
Complete job tracking documentation

Learning Objectives

Describe common file and image issues associated with customer supplied files
List advantages/disadvantages of removable storage media
Explain the significance of PDF as it pertains to the printing industry
Identify various file formats and their extensions: .doc; .qxd; .pdf; .tif; .eps; .rtf; .raw; .jpg; .bmp; .txt; .indd; .psd; .ai; .pub; .html; .gif; .xls; .zip; .dmg; .png; .dng
Explain the process for documenting print job work
Describe the importance of record retention in print project development projects

Comments:

Unit 3: Printing Technology Pathway
Graphic Design and Pre-Press

Competency

5. Obtain scanned or photographic images

Performance Standard Condition

Competence will be demonstrated

at the worksite

Performance Standard Criteria

Performance will be successful when learners:

Obtain images

- Use digital camera to capture image
- Locate image file from a stock photography website
- Locate image file from storage device

Evaluate image originals

Verify key variables (% enlargement/reduction, input resolution to be adjusted)

Calibrate scanner

Scan originals

Evaluate resultant scanned images and make adjustments

Acquire scanned images using appropriate dpi, color and option settings

Complete job tracking documentation

Learning Objectives

Identify high/low resolution images and describe the uses of each

Describe the difference between a raster image and a vector graphic image

Classify Vector and Raster images according to their common uses

Explain basic digital camera hardware and use

Explain basic scanning hardware and use

Compare basic scanner software, its uses, and limitations

Explain and identify the difference between line art and continuous tone originals

Explain appropriate scanner/program operations for line artwork and continuous tone in both black/white and color

Comments:

Unit 3: Printing Technology Pathway
Graphic Design and Pre-Press

Competency

6. Create and/or edit objects, shapes, charts, images and/or graphics

Performance Standard Condition

Competence will be demonstrated

at the worksite

Performance Standard Criteria

Performance will be successful when learners:

Refer to customer requirements and job ticket
Create rough drafts by sketching
Determine size and arrangement of graphics material required
Use computer software to generate object, shape, chart, image and/or graphic
Create or edit images and graphics based on knowledge of principles of design (color theory and schemes, proximity, alignment, repetition, optimization)

- Check size and resolution
- Crop and adjust images as required
- Use filters, effects, warps, 3D
- Correct scanned images
- Manipulate images in a raster based program using layers, transparencies, layer modes, masks, selections, etc.
- Edit a raster image by using cropping, scaling, etc.
- Manipulate drawings/photographs using a vector illustration program

Evaluate visual appeal with worksite professional
Make improvements as needed
Finalize image
Document image information with file
Convert image into a format which can be viewed
Complete job tracking documentation

Learning Objectives

Compare common software packages used to create and edit images and graphics
Describe the difference between a raster image and a vector graphic image
Classify Vector and Raster images according to their common uses
Demonstrate an understanding of the differences between raster and vector files
Discuss how to integrate photographically derived images with hand-drawn graphic images
Describe the use of transformation tools
Explain the use of layers for compositing, applying filters and special effects

Comments:

Unit 3: Printing Technology Pathway
Graphic Design and Pre-Press

Competency

7. Apply and/or correct color

Performance Standard Condition

Competence will be demonstrated

at the worksite

Performance Standard Criteria

Performance will be successful when learners:

Refer to customer requirements and job ticket
Select correct color space for project
Create and apply color
- Use color modes, fills, strokes, gradients, and blends
- Use variations, levels, curves, hue/saturation/brightness and other color tools
- Produce digital color separations
- Demonstrate an understanding of additive and subtractive color, i.e., Red-Green-Blue (RGB) and Cyan-Magenta-Yellow-Key/black (CMYK)
- Use the Pantone Matching System® (PMS) or other color matching system

View or print color separations
Correct color on images
- Use brush features to adjust
- Perform digital color correction and color retouching
- Edit a raster image by using color correction and tone control

Evaluate visual appeal with worksite professional
Make improvements as needed
Finalize color
Document color information with file
Complete job tracking documentation

Learning Objectives

Discuss basic color principles
Explain how color plays a role in design
Explain how color theory is used to select appropriate colors
Define color depth, resolution, pixels, dpi/ppi
Explain color relationships (complimentary, analogous, monochromatic, etc.)
Discuss color theory by describing primary, secondary, and tertiary colors
Explain hue, tint, value and shade, and the effect of light and distance on color
Explain additive and subtractive color theory
Identify colors modes and their use
Describe the Pantone Matching system
Discuss the impact of black and white in design
Explain the effect of lighting on color perception
Explain the effect of the surround on color perception
Explain the significance of standard viewing conditions in the graphic communications industry

Explain how physical color is applied in a print environment
Explain the influence of the substrate on color reproduction

Comments:

Unit 3: Printing Technology Pathway
Graphic Design and Pre-Press

Competency

8. Select typography

Performance Standard Condition

Competence will be demonstrated

at the worksite

Performance Standard Criteria

Performance will be successful when learners:

Refer to customer requirements and job ticket
Select typography
Determine type size needed
- Measure type in points
- Measure line length in picas

Create or modify type
- Determine contrast, angle, terminals
- Select figures, ligatures, letterforms
- Rotate, circle, extend, tint, fill type

Evaluate legibility and readability in context of purpose
Evaluate visual appeal with worksite professional
Make improvements as needed
Finalize typography
Document typography information with file
Complete job tracking documentation

Learning Objectives

Define typography
Discuss how elements of typography are incorporated into overall design
Explain common terms used in typography
Identify structural aspects of type
Explain how to measure type using points and picas
List the major typefaces/font families and their uses
Compare Type I, Postscript, and Open Type fonts
Compare different kinds of typographic guidelines and purposes
Discuss ways designers choose to follow or break typographic rules
Explore decisions for type creation including contrast, angle of stress and terminals
Distinguish between display (headline) type and body (text) type by their point sizes, styles, and uses
Explain letter spacing, tracking, kerning, baseline shift, and horizontal scale
Demonstrate the type arrangements: flush left–ragged right, flush right–ragged left, centered, justified, force justified, and widows and orphans
Illustrate x-height, mean-line, base-line, ascenders, descenders, serifs, leading, and their roles in measuring and designing with type
Illustrate caps, lowercase, uppercase, small caps, and ligatures
Define dingbats, bullets, rules, glyphs, symbols, and their uses in publications

Comments:

Unit 3: Printing Technology Pathway
Graphic Design and Pre-Press

Competency

9. Create and/or edit a layout

Performance Standard Condition

Competence will be demonstrated

at the worksite

Performance Standard Criteria

Performance will be successful when learners:

Refer to customer requirements and job ticket

Use layers and layer groups to organize complex files

Assemble digital elements

- Collect job components to be incorporated (files, images, graphics, typography, etc)
- Identify formats required
- ***Use graphics and/or pre-press software*** (translation, compression)
- Import data into page layout software
- Measure linear dimensions in inches and fractions of inches

Incorporate image(s)

- Review file
- Place photos, illustrations and other images on each page

Select typography and arrangement

- Review file
- Format and place copy on each page
- Measure typography in points and line length in picas

Apply and/or correct color

- Review file
- Edit colors according to production requirements (touch plate, varnish, fifth and sixth color)

Determine size and arrangement of layout

- Create simple grids as a layout device
- Add crop marks and set up overlaying methods
- Measure tolerances
- Fit visual elements in limited space
- Analyze visual hierarchy with a focal point
- Construct a multi-page document using master pages, paragraph, character styles

Verify compatibility of required job components

- Restructure and translate files and graphics

Evaluate layout in context of purpose, quality and accuracy

Evaluate layout with worksite professional

Edit layout and make improvements as needed

Finalize layout

Document layout information with file

Assemble all relevant data utilized in final file into specific locations to final output

Complete job tracking documentation

Learning Objectives

Explain the goals and functions of a layout
Discuss the importance and purpose of layout structure
Explain how to match layout form to message in purposeful ways
Discuss how to match layout design to audience needs and tastes
Interpret the relationship between form and content
Identify the visual hierarchy of design elements
Define the typographical devices used in layouts
Define thumbnails, roughs, comprehensives
Explain how to use a grid
Describe how to align regular and irregular objects on a grid
Identify current copyright laws as applied to a layout design

Comments:

Unit 3: Printing Technology Pathway
Graphic Design and Pre-Press

Competency

10. Perform pre-flight print on job files

Performance Standard Condition

Competence will be demonstrated

at the worksite

Performance Standard Criteria

Performance will be successful when learners:

Refer to customer requirements and job ticket

Verify compatibility of required job components

Perform pre-flight to diagnose potential print problems

- Review for discrepancies in text, fonts, graphics, and images
- Check for correct fonts, image formats, locations of graphics
- ID proper resolution for images
- Measure original images for reduction and enlargement using various methods to determine the percentage for final reproduction
- Verify correct color formats, profiles and separations for output
- Confirm page layout size, margins, bleeds, marks, page information meet constraints
- Ensure correct parts of all files properly located, identified and linked for final output

Resolve any discrepancies with design team

- Restructure and translate files and graphics

Document actions taken

Create proof(s)

- Produce digital and/or analog proofs to show both content and color
- Check proof for adherence to client specifications, company QC standards, and industry standards

Complete job tracking documentation

Learning Objectives

Explain the purpose of pre-flighting

List common checks performed in pre-flight

Explain the use of printing industry and company standards

Discuss common issues in printing and output related to fonts, color, layout and design

Explain the difference in quality of electronic output devices

Comments:

Unit 3: Printing Technology Pathway
Graphic Design and Pre-Press

Competency

11. Review proofs

Performance Standard Condition

Competence will be demonstrated

at the worksite

Performance Standard Criteria

Performance will be successful when learners:

Perform pre-flight on project files

Create proof(s)

Evaluate proof one last time for adherence to customer specifications

Evaluate proof one last time for all printing compatibility requirements

Evaluate proof with worksite professional

Assist worksite professional to submit proof to customer for final approval

Complete job tracking documentation

Return materials to client when required

Learning Objectives

Explain the purpose of proofing

Explain the difference between digital and analog proofs

Explain the difference between supplying PDF files versus native files for print and proofing by customers

Discuss the cost factors involved for incomplete or inaccurate proof(s)

Compare blueline proofs to color print proofs

Comments:

Unit 3: Printing Technology Pathway
Graphic Design and Pre-Press

Competency

12. Trap project files

Performance Standard Condition

Competence will be demonstrated

at the worksite

Performance Standard Criteria

Performance will be successful when learners:

Refer to customer requirements and job ticket
Review trapping requirements with printer prior to output
Determine appropriate elements for trapping
Determine trap settings
Trap digital files using software
Verify completed trapped files

Learning Objectives

Define trapping in the printing industry
Explain the purpose of trapping
Define overlaps (spreads) and underlaps (chokes)
Compare trapping technologies- vector-based versus raster-based
Discuss when each type of trapping technology is used
Explain the common basic rules for applying trapping decisions

Comments:

Unit 3: Printing Technology Pathway
Graphic Design and Pre-Press

Competency

13. Impose and configure press sheets

Performance Standard Condition

Competence will be demonstrated

at the worksite

Performance Standard Criteria

Performance will be successful when learners:

Refer to customer requirements and job ticket to review the layout and job requirements including any special circumstances (shingling, bottling, binding method, crossovers)
Select appropriate imposition technique
Prepare pages or components for final imaging size
Impose digital files according to layout and job requirements using software
Add quality control guides to imposed pages
Create an imposition proof
Review proof with worksite professional
Complete job tracking documentation

Learning Objectives

Define the process of imposition in the printing industry
Discuss the factors that impact imposition choices
Compare imposition formats for different print job configurations
Discuss the cost implications of incorrect or inefficient imposition

Comments:

Unit 3: Printing Technology Pathway
Graphic Design and Pre-Press

Competency

14. Send completed files to RIP

Performance Standard Condition

Competence will be demonstrated

at the worksite

Performance Standard Criteria

Performance will be successful when learners:

Send the print project complete files to raster image processor after all reviews and approvals have occurred

Use standard quality control devices to adjust variables on image setters, proofers, laser printers and plate setters

Download files and fonts as required

Diagnose and correct errors (post-script, network, system and software, file, RIP messages)

Complete job tracking documentation

Learning Objectives

Describe the difference between a raster image and a vector graphic image

Discuss the purpose of raster image processing (RIP)

Explain the stages of RIP

List and define the types of file formats that can be sent to a RIP

Compare software versus standalone RIPs

Compare a continuous tone bitmap and a halftone bitmap

Comments:

Unit 3: Printing Technology Pathway
Graphic Design and Pre-Press

Competency

15. Produce print plates/stencils (N/A for digital printing)

Performance Standard Condition

Competence will be demonstrated

at the worksite

Performance Standard Criteria

Performance will be successful when learners:

Refer job ticket and company requirements for instructions for plate or screen creation
Review production specifications for plate or screen selection
Obtain required materials for plate or screen creation

PLATES

Calibrate the plate making device
Operate the plate making device
- Align plate flat with device
- Expose plate
- Process plate

Inspect the plate for quality control standards
Handle plates correctly

SCREENS

Transfer original image to transparent overlay
Select screen
Coat with emulsion and dry
Place overlay on screen and expose
Complete job tracking documentation

Learning Objectives

Explain the purpose of the plate or screen
Discuss common materials used for plates or screens
Discuss how Computer To Plate (CTP) and Direct To Plate (DTP) technology have revolutionized pre-press
Explain digital plate-making process
Explain digital plate-making equipment for offset and gravure plates
Explain the difference between static output and variable output
Explain the process of creating digital output from a computer file
Explain the screen development process

Comments:

Unit 3: Printing Technology Pathway
Graphic Design and Pre-Press

Competency

16. Maintain pre-press equipment

Performance Standard Condition

Competence will be demonstrated

at the worksite

Performance Standard Criteria

Performance will be successful when learners:

Follow manufacturer guidelines for cleaning, maintenance, service and repair
Identify maintenance schedule for equipment that requires routine maintenance
Label equipment appropriately to show malfunction, if applicable
Identify location of repair service information, maintenance manuals, and/or troubleshooting guides
Verify procedure to follow
Perform/call service for routine maintenance or malfunction in accordance with equipment manual/maintenance instructions and service agreements
Assist worksite professional with back-ups and software/hardware updates
Document the maintenance and/or repair/troubleshooting performed

Learning Objectives

Identify and describe basic pre-press production equipment used in a commercial printing plant, including: computer workstation, proofing device, platesetter, and scanner
Describe the use and maintenance of your department/facility's imaging and scanning equipment
Explain why performing routine maintenance of equipment reduces costs to the facility
Describe the materials and information needed to determine an equipment maintenance schedule
Describe the basic procedure to be followed when a piece of equipment is not functioning properly in your department/facility
Discuss how tracking of equipment maintenance and servicing is done in the department/facility
List the critical pieces of equipment in your department/facility which require priority repairs when malfunctioning
Explain your department/facility's back up plan and disaster recovery plan

Comments:

Unit 3: Printing Technology Pathway
Graphic Design and Pre-Press

Competency

17. Participate on a print project team

Performance Standard Condition

Competence will be demonstrated

at the worksite

Performance Standard Criteria

Performance will be successful when learners:

Review the scope and phases of the design project with worksite professional

Participate in the following project team activities to develop and implement the print project plan as able

- Identify customer requirements
- Compare customer requirements to industry and company printing standards
- Develop schedules from approved specifications
- Investigate the legal and financial requirements of the project
- Estimate required resources and budget
- Estimate supply quantities needed
- Estimate time requirements
- Identify interdependencies
- Identify critical milestones
- Develop job ticket
- Track critical milestones
- Regularly report project status to team members in a timely and accurate manner as required
- Monitor and document client-requested changes

Periodically review print project plan activities completed and their results

Learning Objectives

Explain the sequence of events for a print project

List the phases of the printing process- design, pre-press, press, post-press

Explain factors that need to be considered when estimating costs and budget

Classify costs (e.g., direct and indirect, fixed and variable, methods and standards)

Apply basic math skills to calculate the quantity and cost of materials needed

Explain the impact publication process and distribution method have on product development

Explain how to compute ink proportions, paper stock, imposition configurations, material control costs

Comments: