

## Drafting Pathway Test Blueprint

### I. Tools

#### A. Drafting instruments

1. Interpret the different types of scales.

a. Read a fractional scale.

b. Read an architect scale.

c. Read an engineering scale.

d. Read a metric scale.

2. Utilize drafting equipment.

a. Identify a variety of drafting equipment (e.g., triangles, T-squares, compasses, protractor, etc.).

b. Determine the proper use of drafting equipment (e.g., triangles, T-squares, compasses, protractor, micrometer, calipers, etc.).

#### B. Basic workplace equipment

1. Identify and understand the use of basic tools.

a. Identify proper use of a variety of hand tools (e.g., hammer, squares, chisels, files, tape measure, etc.).

b. Identify proper use of a variety of power tools (e.g., drills, circular saw, etc.).

2. Identify and utilize basic workplace equipment.

a. Identify proper use of stationary basic workplace equipment (e.g., table saw, miter saw, sanders, drill presses, band saws, pedestal grinders, etc.).

#### C. CAD software and hardware

1. Demonstrate the use of a CAD system.

a. Identify the use of CAD commands (e.g., line, circle, arc, array, etc.).

b. Utilize commands to modify a drawing (e.g., stretch, mirror, extend, scale, etc.).

c. Utilize CAD settings and functions (e.g., coordinate system, layers, ortho, grid, etc.).

2. Recognize and identify different parts of the CAD work station.

a. Identify input and output devices (e.g., keyboard, mouse, monitor, printer, plotter, etc.).

b. Demonstrate file/data management.

c. Demonstrate file navigation.

### II. Safety

#### A. Recognition of hazards

1. Recognize personal safety hazards.

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a.	Analyze situations for examples of slip, trip, and fall hazards (e.g., oil on the floor, water on the floor, cords, debris, ladders, scaffolding, etc.).
b.	Analyze situations for examples of safety issues (e.g., line of fire, kick-back, etc.).
c.	Identify hazards and type of personal protective equipment (PPE) to address potential hazards (e.g., ear plugs, flying chips, safety glasses, long hair, respiratory, etc.).
d.	Identify potential electrical hazards (e.g., frayed cords, bad grounds, sporadic switches, electrical shock hazards, etc.).
e.	Identify potential fire hazards and prevention methods (e.g., oily rags, fire extinguisher, welding blankets, etc.).
<b>B. Recognize and demonstrate safe workplace practices</b>	
1. Apply good housekeeping and organizational skills.	
a.	Apply proper workplace organizational procedures.
b.	Identify appropriate cleaning procedures (e.g., cleaning up tools, debris cleanup, etc.).
2. Understand appropriate workplace behavior.	
a.	Compare and contrast appropriate and inappropriate workplace behavior (e.g., intentional unsafe acts, running in workplace, etc.).
b.	Apply the proper use of safety guards and procedures.
c.	Demonstrate safe working practices (e.g., safe lifting procedures, avoiding repetitive motion, ergonomics etc.).
<b>C. Safety regulations and emergency preparedness</b>	
1. Understand the roles of national regulatory agencies in creating safe work environments.	
a.	Define the role of OSHA in workplace safety.
b.	Define the role of the EPA in environmental safety.
2. Identify procedures for First Response.	
a.	Identify proper procedures for First Response to an emergency (e.g., call 911, what to do / not to do when someone is getting electrocuted, chemical spill, bodily injury, etc.).
<b>III. Technical drawing</b>	
<b>A. Documents, Plans, and Modeling</b>	
1. Recognize plans and documents within different design disciplines.	
a.	Identify elements of construction (architectural) documents (e.g., civil, architectural, electrical, mechanical, structural, specifications, etc.).
b.	Identify features of engineering (mechanical) working drawings (e.g., assembly, detail, section, exploded assembly, materials list, etc.).

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### 2. Read and evaluate technical drawings, documents, and specifications.

- a. Interpret the elements within a set of construction (architectural) documents (e.g., floor plans, elevations, sections, foundation, etc.).
- b. Interpret the features of engineering (mechanical) working drawings (e.g., assembly, detail, section, exploded assembly, etc.).

### 3. Recognize presentation and modeling methods.

- a. Distinguish between different types of 3D models (e.g., wireframe, virtual walk-throughs, surfaces, prototypes, renderings, etc.).
- b. Identify the 3D modeling method that would best evaluate a given problem (e.g., wireframe, surface, solid model, etc.).

## B. Drafting conventions

### 1. Understand and apply the alphabet of lines.

- a. Identify standard line types (e.g., object, hidden, center, phantom, section, construction, etc.).
- b. Distinguish between standard line weights (e.g., object, hidden, center, phantom, section, construction, etc.).

### 2. Understand and create technical drafting views and layouts.

- a. Interpret the proper use of orthographic views.
- b. Interpret proper use of section views.
- c. Interpret proper use of auxiliary views.
- d. Interpret proper use of pictorial views (e.g., isometric, perspective, oblique, assembly, etc.).
- e. Determine proper drawing layout (e.g., sheet size, scale, etc.).

### 3. Understand the importance of sketching.

- a. Identify the purpose of a sketch in the design process (e.g., initial design, revision, etc.).
- b. Apply sketching as a communication tool.

### 4. Understand proper dimensioning practices.

- a. Differentiate between different dimension styles (e.g., architectural, decimal, engineering, metric, etc.).
- b. Identify the two types of dimensions (i.e., location and size).
- c. Interpret the proper use of annotation, symbols, and specifications.
- d. Recognize appropriate geometric dimensioning and tolerancing (GD&T).
- e. Interpret the proper use of technical drawing standards (e.g., ANSI, ASME, ISO).

### 5. Identify and analyze geometric construction techniques.

- a. Recognize geometric constraints (e.g., parallel lines, perpendicular,

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	concentric, tangent, etc.).
	b. Recognize geometric shapes (e.g., polygons, ellipses, circles, arcs, lines, etc.).
	c. Differentiate between a chamfer and a fillet.
<b>IV. Materials and Pre-Construction Processes</b>	
<b>A. Construction Materials</b>	
	1. Identify commonalities and differences between residential and commercial construction materials.
	a. Identify the use of common construction materials (e.g., wood, metal, brick, concrete, etc.).
	b. Identify the use of common finish materials (e.g., flooring, wall finishes, wallcovering, etc.).
	c. Recognize the difference between nominal and actual size of common materials (e.g., dimensional lumber, brick, tile, concrete block, etc.).
	2. Understand sustainable construction materials.
	a. Identify sustainable construction materials.
	b. Compare and contrast sustainable versus conventional construction materials.
<b>B. Design and Pre-Construction Process</b>	
	1. Recognize the effects of regulations and codes on the design process.
	a. Define the role of Americans with Disabilities Act (ADA) in the construction process.
	b. Define the role of building codes in the construction process.
	c. Define the role of regulatory agencies in construction process (e.g., codes, zoning, EPA, etc.).
	2. Recognize the importance of sustainability and building information modeling (BIM) in the design process.
	a. Define the role of sustainability in the design process (e.g., LEED and USGBC).
	b. Identify the role of BIM in the design process.
	c. Compare and contrast sustainable versus conventional construction process.
	3. Apply basic organizational, spatial, structural, and construction principles in the design process.
	a. Apply interior design concepts (e.g., work triangle, traffic patterns, work flow, etc.).
	b. Apply exterior design concepts (e.g., materials, solar pattern, egress, etc.).