Industrial Print Reading

Course Structure with PBOs Aligned

Module 1 & Module 2

MODULE 1

Topic Unit One: Introduction to Print Reading (timeline)

1. Definition of a print
2. Types of prints
3. Six steps to reading a print

PBOs Covered in Unit 1

BP1: Demonstrate understanding of print basics and definitions by:

- Stating the definitions of a print
- Identifying different types of prints and stating their use
- Listing and explaining the 6 steps in reading a print

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Topic Unit Two: Alphabet of Lines (timeline)

1. Types
    i. Object line
    ii. Hidden line
    iii. Centre line
    iv. Extension line
    v. Dimension line
    vi. Phantom line
    vii. Cutting plane line
    viii. Viewing line
    ix. Short break line
    x. Long break line
2. Application
3. Identification

PBOs Covered in Unit 2

Identify and name the different types of lines that are typically found on prints:

- Define the different types of lines found on prints
- Explain the purpose of each type of line
- Identify and define orientation and shape terminology
- Recognize and name a variety of geometric shapes

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Topic Unit Three: Scales (timeline)

1. Definition of a scale
2. Difference between a scale and a rule
3. Different types of scales
4. Usage of scales
5. Conversion of Metric and English Measurements

PBOs Covered in Unit 3

Explain types and uses of scales. BP3, BP19

BP3: Demonstrate a clear understanding of scales and their use by:

- Stating the definition of a scale
- Explaining the difference between a scale and a rule
- Identify the different types of scales
- Explain the usage of scales

BP19: Demonstrate proficiency in conversion between Metric and English Measurements

Lab/Project _____

Topic Unit Four: Sketching (timeline)

1. Definition of sketching
2. Types of sketching
   - i. Orthographic
   - ii. Pictorial
     - 1) Axonometric
       - a. Diametric
       - b. Trimetric
       - c. Isometric
   - iii. Oblique
     - 1) Cabinet
     - 2) Cavalier
   - iv. Perspective
     - 1) Perspective one
     - 2) Perspective two
     - 3) Perspective three

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PBOs Covered in Unit 4

Explain types and importance of sketches. BP4, BP5

BP4: Define and give examples of orthographic projection by:

- Explaining the 3 principle planes of projection as they relate to the development of views.
- Explaining and demonstrate and how multiviews are developed - Demonstrating how multiviews are read.
- Identifying the different views.
- Differentiate between 2D and 3D views.
- Show the difference between 3rd angle projection and 1st angle projection.
- Explain the different dimensions that are typically found in each view (Front view, height and length or width dimensions etc.)

BP5: Define sketching by:

- Providing a definition of sketching
- Explaining the importance of sketching
- Explaining the different types of sketches

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Topic Unit Five: Multiviews (timeline)

1. Principle planes of projection
    i. Frontal
    ii. Horizontal
    iii. Profile
2. Planes of Projection
    i. 6 or more
3. Glassbox Method or Transparent Method
4. Projection
5. Lines and Surfaces
    i. Normal
    ii. Incline
    iii. Oblique
6. Rounds, Fillets, Run-outs
7. Types of Holes
    i. Counterbore
    ii. Spotface
    iii. Countersink
    iv. Tapered
    v. Blind
    vi. Simple

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PBOs covered in Unit 5

Demonstrate understanding of multiviews/orthographic projection. *BP4

BP4: Define and give examples of orthographic projection by:

- Explaining the 3 principle planes of projection as they relate to the development of views.
- Explaining and demonstrate and how multiviews are developed
- Demonstrating how multiviews are read.
- Identifying the different views.
- Differentiate between 2D and 3D views.
- Show the difference between 3rd angle projection and 1st angle projection.
- Explain the different dimensions that are typically found in each view (Front view, height and length or width dimensions etc.)

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Topic Unit Six: Assemblies (timeline)

1. Definition
2. Purpose
3. Types
    i. Sub-assemblies/components
    ii. Standard and non-standard parts
4. Title Block
5. Revision Schedule
6. Bill of material
7. Tolerance schedule
8. Borders

PBOs Covered in Unit 6

BP 9: Identify title block information by being able to do the following:

- Explain the purpose of the title block.
- Identify each area of the title block.
- Name the areas that are typically found in a title block.
- Explain the information located in the identified areas of a title block.

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Topic Unit Seven: Auxiliary Views (timeline)

1. Definition
2. Purpose
3. Types
   i. Primary
   ii. Secondary
   iii. Successive
   iv. Full
   v. Partial
   vi. Top view auxiliary view
   vii. Front view auxiliary view
   viii. Side view auxiliary view

PBOs Covered in Unit 7

Explain types and uses of auxiliary views. BP6

BP6: Identify and define auxiliary and section views by doing the following:

- State the definition of an auxiliary view.
- Name the different types of auxiliary views.
- Explain how auxiliary views are developed.
- Explain how auxiliary views are used on a print.
- State the definition of a section view.
- Identify the different kinds of section views found on a print.
- Show the difference between each kind of section view.
- Explain the purpose for each kind of section view.

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MODULE 2

Topic Unit Eight: Section Views (timeline)

1. Definition
2. Purpose
3. Types
   i. Full section
   ii. Offset section
   iii. Half section
   iv. Revolve section
   v. Aligned
   vi. Broken out
   vii. Removed
4. Elements of Sectioning
   i. Cutting plane line
   ii. Section line
   iii. Labelling
   iv. Arrowheads
5. Features that are not Section Line
   i. Holes
   ii. Slots
   iii. Key ways
   iv. Spokes
   v. Gear teeth
   vi. Webs
   vii. Ribs

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Topic Unit Nine: Dimensioning (for Manufacturing) (timeline)

1. Definition
2. Purpose
3. Importance
4. Elements
    i. Extension lines
    ii. Centre lines
    iii. Dimension lines
    iv. Arrowheads
    v. Leaders
5. Systems of Dimensions
    i. Aligned
    ii. Uni-directional
6. Notes
    i. General
    ii. Specific
    iii. Thread Callout
    iv. Representation
        1) Schematic
        2) Simplified
        3) Detail

PBOs Covered in Unit 9

Recognize dimension and tolerance. BP7

BP7: Define dimensions and tolerances, recognizing the following:

- Explain the elements in dimensioning. (Extension lines, leaders, dimension lines, arrowheads)
- Demonstrate how to read dimensions on a print.
- Explain the difference between datum dimension and continuous or chain-like dimensions
- Define size and location dimensions.
- Define and identify the different types of tolerance, and explain their importance.
- Identify and interpret dimensions and tolerances.

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Topic Unit Ten: GD&T (Geometric Dimensioning and Tolerancing)

1. Definition
2. Datum
3. Geometric Control Characteristics
    i. Form
        1) Straightness
        2) Flatness
        3) Circularity (Roundness)-
        4) Cylindricity
    ii. Profile
        1) Of a Line
        2) Of a Surface
    iii. Orientation
        1) Angularity
        2) Perpendicularity
        3) Parallelism
    iv. Location
        1) Position
        2) Concentricity
        3) Symmetry
    v. Runout
        1) Circular
        2) Total
4. Supplementary Symbols
    i. Maximum Material Condition
    ii. Least Material Condition
    iii. Projected Tolerance Zone
    iv. Basic Dimension
    v. Datum Features
    vi. Datum Target
5. Types of Fits
    i. Loose Fit
    ii. Tight Fit
    iii. Determining Fits
6. Types of Tolerances
    i. Bilateral
    ii. Unilateral
    iii. Limits
7. Feature Control Frame

Final Exam/Lab/Project_____

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