Entry Level Assessment Blueprint
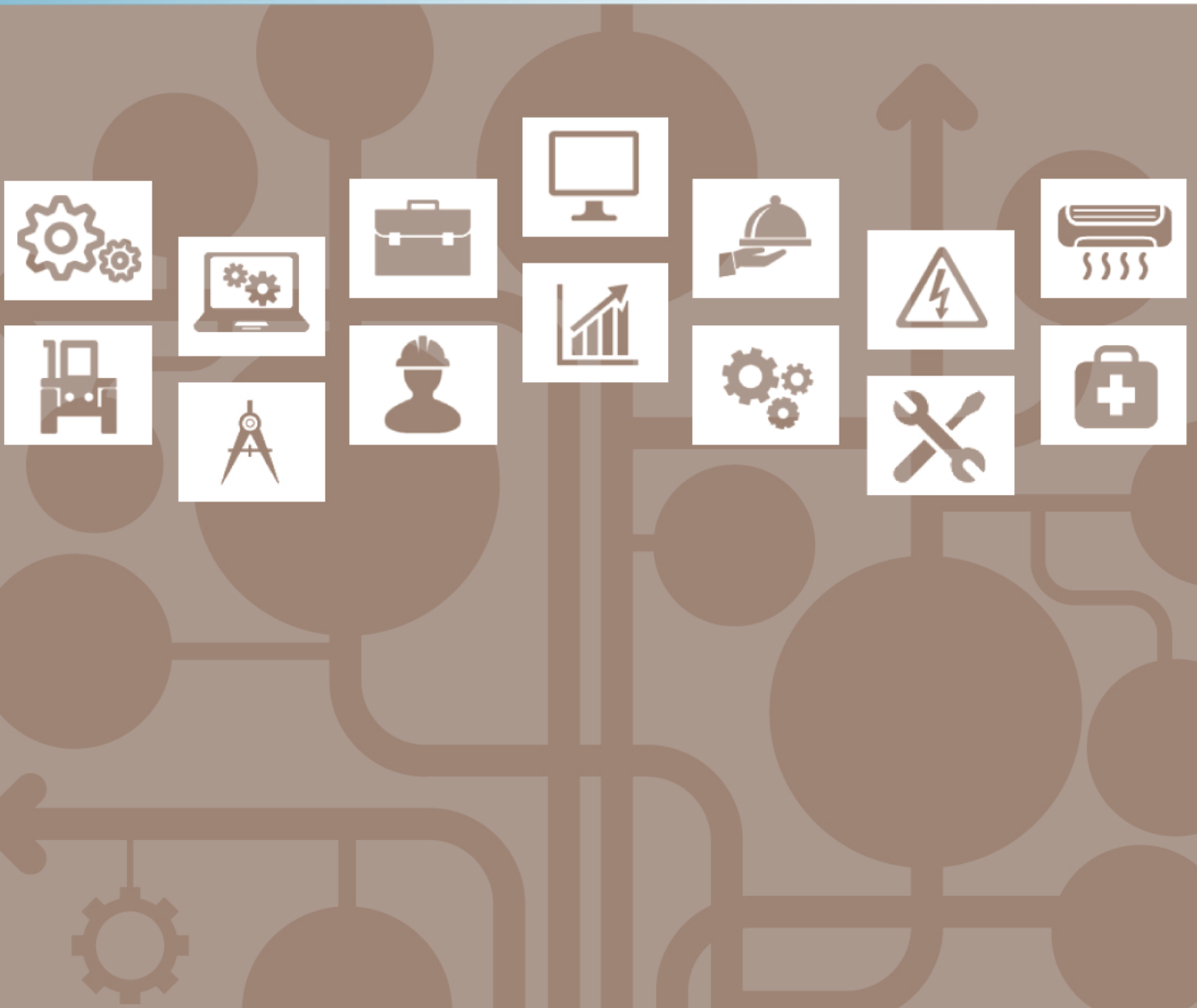
CAD

Specific Competencies and Skills Tested in this Assessment:

Computer Systems and File Management

- Hardware and operating systems
- File management and sharing

Print Reading

- Interpret views in engineering drawings
- Interpret bilateral, unilateral, and limit dimensions
- Interpret drawings, pictures, and drafting symbols
- Interpret GD&T symbols
- Interpret hole dimensioning

Measuring

- Identify proper measurement principles
- Interpret micrometer measurements

Drawing Creation

- Determine and create appropriate drawing views and scales
- Organize required drawings and sheet coordination
- Insert and modify appropriate dimensions into drawings
- Create, insert, and modify notes and labels into drawings
- Create or insert symbols into drawings with legends
- Construct and modify drawing geometries
- Assign and coordinate line types and levels
- Construct and modify block geometries
- Construct and detail an assembly view
- Identify key components in a title block
- Locate points using the Cartesian Coordinate System
- Create single and multiple auxiliary views of surfaces and objects
- Construct schedules (e.g., Bill of Materials, parts list)

Creating Parameters

- Set up text and fonts
- Create and modify dimension styles
- Differentiate plot styles and scales
- Identify and interpret industry standards related to engineering drawings (e.g., ISO, ANSI, JIS)
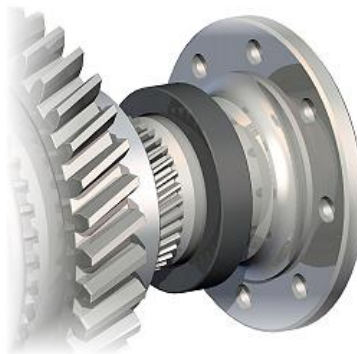
Drawing Views

- Identify various types of pictorial views
- Select and manipulate the correct orthographic views
- Identify and interpret various section views
- Define and apply auxiliary views
- Summarize the applications of rendered views
- Describe the application of detail views
- Organize and generate exploded assemblies

3-D Modeling

- Generate and modify construction entities (e.g., planes, axis, points)
- Create and detail 2-D drawings from a 3-D model
- Create and modify a feature geometry-based 3-D model
- Create and constrain 3-D assemblies
- Create, modify, and apply material properties (e.g., types, volume, mass)
- Importation and application of standard parts to 3-D assemblies
- Produce alternative output (e.g., rapid prototype, CNC)

Written Assessment:

Administration Time: 3 hours
Number of Questions: 160

Areas Covered:

      4%   Computer Systems and File Management
      15%   Print Reading
      4%   Measuring
      31%   Drawing Creation
      9%   Creating Parameters
      16%   Drawing Views
      21%   3-D Modeling

Computer Systems and File Management — 4%

Print Reading — 15%

Measuring — 4%

Drawing Creation — 31%

Creating Parameters — 9%

Drawing Views — 16%

3-D Modeling — 21%
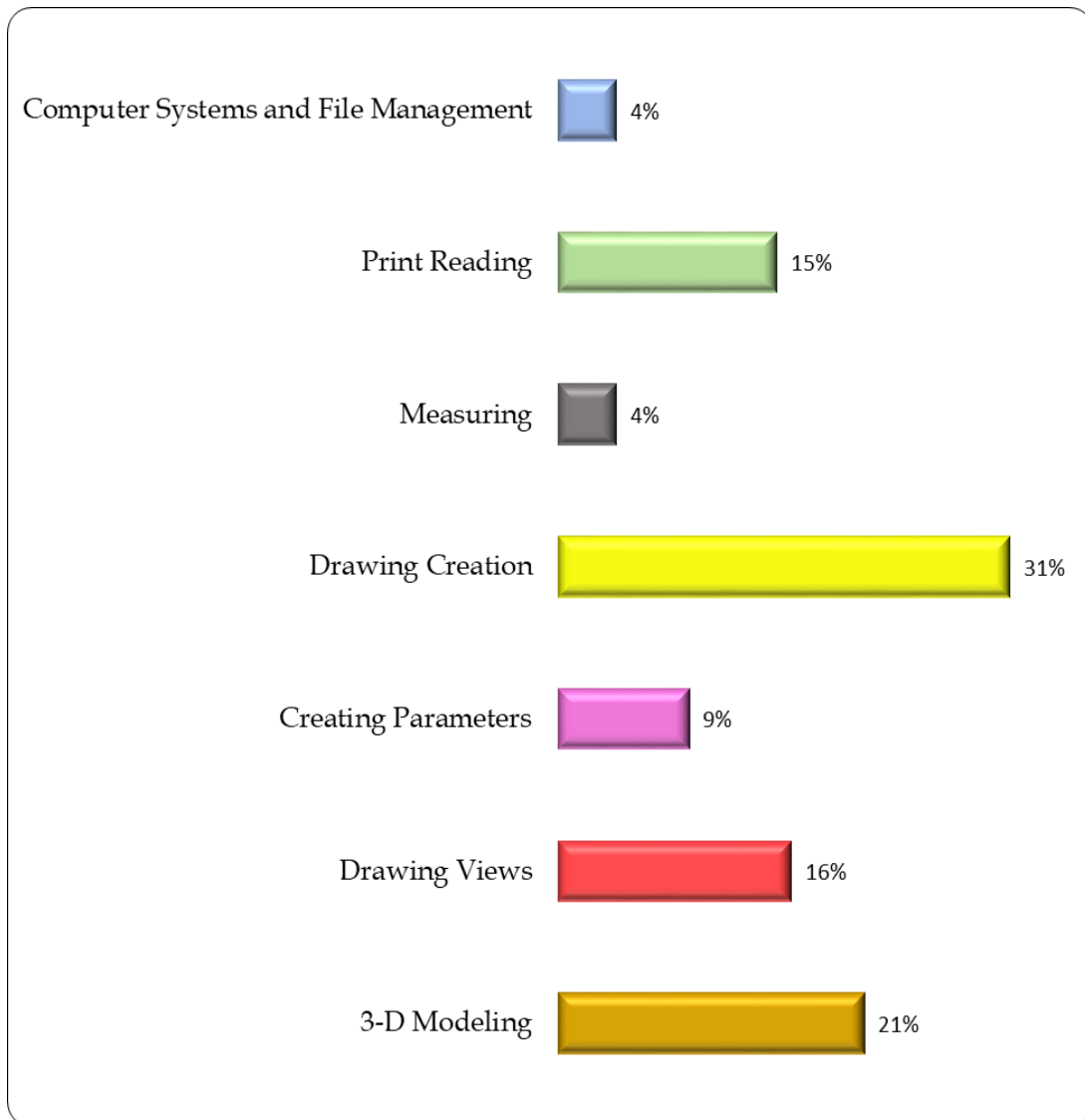
Sample Questions:

Equipment and devices in a Computer Aided Drafting system are known as
  A. Software
  B. hardware
  C. modules
  D. systems

Unlike other types of section views, _____ sections show hidden lines if they exist.
  A. full
  B. offset
  C. enlarged
  D. half

A drawing scale of half size should be labeled
  A. 1:0
  B. 1:2
  C. 2:1
  D. 4:2

When using GD&T, positional tolerances should refer to a
  A. centerline
  B. datum
  C. object
  D. coordinate

To accurately measure the depth of a .5 diameter hole, use a/an
  A. steel rule
  B. slide caliper
  C. inside caliper
  D. OD micrometer

Performance Assessment:

Administration Time: 2 hours
Number of Jobs: 3

Areas Covered:

36%   **Create a 2-D Orthographic Drawing with a Section View**
Participants will print and plot to scale, write the correct title block, draw the hatch, views, dimensions and placement correctly, and save the file

26%   **Create a 3-D Solid Model**
Participants will build correct radius corners and holes with the correct mass properties and save the file.

38%   **Create Two Parts to be Mated and Mate the Parts**
Participants will create two parts with the correct feature geometry and volume properties and mate the two parts and save the file.
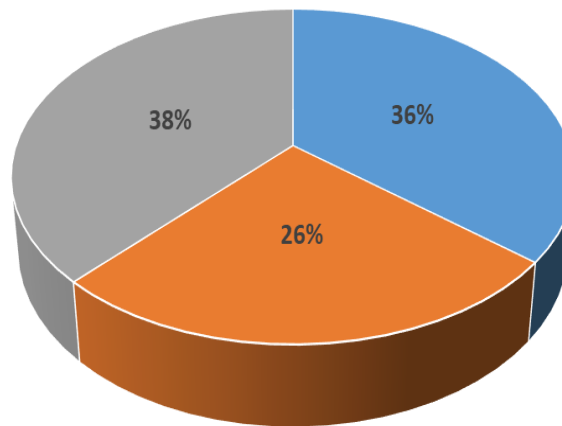
Sample Job: Create Two Parts to be Mated and Mate the Parts

Maximum Time: 1 hour

Participant Activity: The participant, using the CAD system provided, will create complete 3-D solid models of the parts as shown, determine and print out the volume of Part A and Part B, mate Part A and Part B, and save the complete job to CD or equivalent storage media with the file name.