PREPARE AND INTERPRET TECHNICAL DRAWINGS

UNIT CODE: ENG/OS/AUT/CC/1/5/A

UNIT DESCRIPTION

This unit covers the competencies required to prepare and interpret technical drawings. It involves competencies to select, use and maintain drawing equipment and materials. It also involves producing plain geometry drawings, solid geometry drawings, pictorial and orthographic drawings of components and application of CAD packages.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT	**PERFORMANCE CRITERIA** *(Bold and italicized terms are elaborated in the Range)*
1. Use and maintain drawing equipment and materials	1.1 ***Drawing equipment*** are identified and gathered according to task requirements 1.2 ***Drawing materials*** are identified and gathered according to task requirements 1.3 Drawing equipment are used and maintained as per manufacturer's instructions 1.4 Drawing materials are used as per workplace procedures 1.5 Waste materials are disposed in accordance with workplace procedures and ***environmental legislations*** 1.6 ***Personal Protective Equipment*** is used according to occupational safety and health regulations
2. Produce plain geometry drawings	2.1 Different **types of lines** used in drawing and their meanings are identified according to standard drawing conventions 2.2 Different types of ***geometric forms*** are constructed according to standard drawing conventions 2.3 Different **types of angles** are constructed according to principles of trigonometry 2.4 Different types of angles are measured using appropriate measuring tools 2.5 Angles are bisected according to standard drawing conventions 2.6 Sketches and drawings of patterns are interpreted according to standard conventions 2.7 Patterns are developed in accordance with standard conventions
3. Produce pictorial and orthographic drawings of components	3.1 Different **symbols and abbreviations** are identified, and their meaning interpreted according to standard drawing conventions

ELEMENT	PERFORMANCE CRITERIA *(Bold and italicized terms are elaborated in the Range)*
	3.2 **Isometric sketches and drawings** of components are interpreted and produced in accordance with the standard conventions of isometric drawings 3.3 First and third angle orthographic sketches and drawings of components are interpreted and produced in accordance with the standard conventions of orthographic drawings 3.4 Freehand sketching of different types of geometric forms, tools, equipment, diagrams and components is conducted
4. Produce assembly drawings	4.1 Orthographic views are exploded according to standard conventions of **orthographic drawings.** 4.2 **Pictorial views** are exploded according to standard conventions of orthographic drawings. 4.3 Part lists are identified according to part to be produced 4.4 **Sectional views** are produced according to standard conventions of drawing. 4.5 Produced drawing is hatched according to standard conventions of drawings.
5. Apply CAD packages in drawing	5.1 **CAD packages** are selected according to task requirements 5.2 CAD packages are applied in production of engine parts, electrical and electronic circuits and vehicle body parts drawings

RANGE

Variable	Range
1. Drawing equipment may include but is not limited to:	• Drawing boards • T-square • Set squares • Drawing set • Computers with CAD packages
2. Drawing materials may include but is not limited to:	• Drawing papers • Pencils • Erasers • Masking tapes • Paper clips
3. Types lines may include but is not limited to:	• Boarder lines • Faint continuous lines

Variable	Range
	• Broken lines • Chain lines • Centre lines • Cutting lines
4. Types of Angles may include but is not limited to:	• 30 degrees • 45 degrees • 60 degrees • 90 degrees • 180 degrees
5. Symbols and abbreviations may include but is not limited to:	• First angle • Third angle • E,g, of abbreviations Scale- 1:2 Diameter – D20 Radius -R20
6. Isometric sketches and drawings may include but is not limited to:	• Use of 30 degrees
7. Orthographic drawings. may include but is not limited to:	• Front view • End view • Plan view
8. Pictorial views may include but is not limited to:	• Front view • End view • Plan view
9. Sectional views may include but is not limited to:	• Cutting lines • Assembled view
10. CAD packages may include but is not limited to:	• Modifying tools • 2D • Roster tool • Layout space • Drawing tool
11. Environmental legislations may include but is not limited to:	• EMCA 1999 • OSHA 2007
12. Personal Protective Equipment may include but is not limited to:	• Dust coats • Closed leather shoes • Goggles for CAD
13. Geometric forms may include but is not limited to:	• Circles • Triangles • Rectangles • Parallelogram

Variable	Range
	• Polygons • Pyramids • Conic sections • Prisms • Loci
14. Standard drawing conventions	• Anatomy of engineering drawing (title block, coordinate grid system, revision block, notes and legends) • Drawing scale (paper size and drawing symbols) • International drawing standards

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required skills

The individual needs to demonstrate the following skills:

- Critical thinking
- Drawing
- Interpretation
- Drawing equipment handling
- Analysis and synthesis
- Communication
- Inter personal

Required knowledge

The individual needs to demonstrate knowledge of:

- Drawing equipment and materials
- Freehand sketching
- Lettering
- Geometrical constructions
- Types of drawings
- Types of lines
- Isometric drawing conventions, features, characteristics, components
- Orthographic drawing conventions, features, characteristics, components
- Sketches and drawings of simple patterns

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and understanding and range.

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Applied and adhered to safety procedures

	1.2 Cared and maintained drawing equipment 1.3 Interpreted circuit, assembly and lay out diagrams 1.4 Applied appropriate technical standards, used proper tools and equipment for a given task 1.5 Produced sketches and drawings 1.6 Applied CAD packages in production of drawings
2. Resource Implications	Resources the same as that of workplace are advised to be applied. 2.1 Drawing room 2.2 Drawing equipment and materials 2.3 Computers 2.4 CAD packages
3. Methods of Assessment	Competency may be assessed through: 3.1 Practical tests 3.2 Observation
4. Context of Assessment	Competency may be assessed individually in the actual workplace or a simulated work place setting or during Indudtrial Attachment.
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.