

PREPARE AND INTERPRET APPLIED GEOMETRY DRAWINGS

UNIT CODE: ENG/OS/AUT/CC/1/4/A

UNIT DESCRIPTION

This unit covers the competencies required to prepare and interpret applied geometry drawings. It involves selecting, using and maintaining drawing equipment and materials. It also involves printing, constructing of lines and interpreting symbols, producing plane and solid geometry drawings and producing pictorial and orthographic drawings of components.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA (<i>Bold and italicized terms are elaborated in the Range</i>)
1. Use and maintain drawing equipment and materials	1.1 <i>Drawing equipment</i> are identified and gathered according to task requirements 1.3 Drawing equipment are used and maintained as per manufacturer's instructions 1.4 <i>Drawing materials</i> are used as per workplace procedures 1.5 Drawing equipment are maintained and stored as per the work place procedures 1.5 Waste materials are disposed in accordance with workplace procedures and <i>environmental legislations</i> 1.6 <i>Personal Protective Equipment</i> is used according to occupational safety and health regulations
2. Print, construct lines and interpret symbols	2.1 Letters and numbers are printed as per <i>standard drawing conventions</i> 2.2 Different <i>types of lines</i> are identified and constructed as per standard drawing conventions 2.3 Different methods of bisecting lines are identified and constructed as per standard drawing conventions 2.4 Different methods of dimensioning are identified and constructed as per standard drawing conventions 2.5 Different <i>symbols and abbreviations</i> are identified, and interpreted according to standard drawing conventions

ELEMENT	PERFORMANCE CRITERIA (<i>Bold and italicized terms are elaborated in the Range</i>)
3. Produce plane geometry drawings	3.1 Different types of triangles are identified and constructed according to standard drawing conventions 3.2 Different types of quadrilaterals are identified and constructed as per standard drawing conventions 3.3 Different types of polygons are identified and constructed as per standard drawing conventions 3.4 Different types of circles are identified and constructed as per standard drawing conventions 3.5 Different <i>types of angles</i> are identified and constructed according to principles of trigonometry 3.6 Different types of angles are bisected according to standard drawing conventions 3.7 Sketches and drawings of patterns are interpreted according to standard drawing conventions 3.8 Patterns are developed in accordance with standard drawing conventions
4. Produce Solid geometry drawings	4.1 Different Surfaces of regular solids are identified and developed as per standard drawing conventions 4.2 Different surfaces of Truncated regular solids are identified and constructed as per standard drawing conventions 4.3 Different surfaces of true shapes of sections on regular solids are identified and constructed as per standard drawing conventions
5. Produce pictorial and orthographic drawings of components	5.1 Different symbols and abbreviations are identified, and their meaning interpreted according to standard drawing conventions 5.2 <i>Isometric drawings</i> are identified, interpreted and constructed in accordance with standard drawing conventions 5.3 <i>Oblique drawings</i> are identified, interpreted and constructed as per standard drawing conventions

ELEMENT	PERFORMANCE CRITERIA (<i>Bold and italicized terms are elaborated in the Range</i>)
	5.4 <i>Orthographic projection drawings</i> are identified, interpreted and constructed as per standard drawing conventions 5.5 5.6 First and third angle orthographic sketches and drawings are identified, interpreted and constructed in accordance with standard drawing conventions 5.7 Freehand sketching of different types of <i>geometric forms</i> , tools, equipment, diagrams and components are constructed

RANGE

Variable	Range
1. Drawing equipment may include but is not limited to:	<ul style="list-style-type: none"> • Drawing boards • T-square • Set squares • Drawing set • Computers with CAD packages
2. Drawing materials may include but is not limited to:	<ul style="list-style-type: none"> • Drawing papers • Pencils • Erasers • Masking tapes • Paper clips
3. Types of lines may include but is not limited to:	<ul style="list-style-type: none"> • Boarder lines • Faint continuous lines • Broken lines • Chain lines • Centre lines • Cutting lines
4. Types of Angles may include but is not limited to:	<ul style="list-style-type: none"> • 30 degrees • 45 degrees • 60 degrees • 90 degrees • 180 degrees
5. Symbols and abbreviations may include but is not limited to:	<ul style="list-style-type: none"> • First angle • Third angle • E,g, of abbreviations Scale- 1:2

	<p>Diameter – D20 Radius -R20</p>
6. Isometric sketches and drawings may include but is not limited to:	<ul style="list-style-type: none"> • Use of 30 degrees
7. Orthographic projection drawings may include but is not limited to:	<ul style="list-style-type: none"> • Front view • End view • Plan view
8. Pictorial views may include but is not limited to:	<ul style="list-style-type: none"> • Front view • End view • Plan view
9. Oblique drawings may include but is not limited to:	<ul style="list-style-type: none"> • Cavallier • Cabinet
10. Environmental legislations may include but is not limited to:	<ul style="list-style-type: none"> • EMCA 1999 • OSHA 2007
11. Personal Protective Equipment may include but is not limited to:	<ul style="list-style-type: none"> • Dust coats • Closed leather shoes
12. Geometric forms may include but is not limited to:	<ul style="list-style-type: none"> • Circles • Triangles • Rectangles • Parallelogram • Polygons • Pyramids • Conic sections • Prisms • Loci
13. Standard drawing conventions may include but is not limited to:	<ul style="list-style-type: none"> • 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
- 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: <ul style="list-style-type: none"> 1.1 Applied and adhered to safety procedures correctly 1.2 Used and maintained drawing equipment appropriately 1.3 Used PPEs correctly 1.4 Printed, interpreted and constructed lines and interpreted symbols correctly 1.5 Identified, interpreted and constructed plane geometry drawings correctly 1.6 Identified, interpreted and constructed solid geometry drawings correctly 1.7 Identified, interpreted and constructed pictorial and orthographic drawings correctly 1.8 Produced sketches and drawings freehands correctly 1.9 Disposed waste material correctly
2. Resource Implications	Resources the same as that of workplace are advised to be applied. <ul style="list-style-type: none"> 2.1 Drawing room 2.2 Drawing equipment and materials
3. Methods of Assessment	Competency may be assessed through: <ul style="list-style-type: none"> 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 Industrial Attachment
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

APPLY BASIC MATHEMATICS

UNIT CODE: ENG/OS/AUT/CC/2/4/A

UNIT DESCRIPTION:

This unit describes the competencies required in order to apply basic mathematics. It also involve applying basic arithmetic, rational arithmetic, manipulative skills, mensuration, algebra and geometrical calculations.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT These describe the key outcomes which make up workplace function.	PERFORMANCE CRITERIA These are assessable statements which specify the required level of performance for each of the elements. <i>Bold and italicized terms are elaborated in the Range.</i>
1. Apply Basic arithmetic	1.1 Various <i>types of numbers</i> are identified as per concept 1.2 Arithmetic <i>operations</i> are carried out as per concept 1.3 Calculations of finding squares and square roots of numbers are carried out as per the 3-figure tables 1.4 Calculations using <i>indices</i> in multiplication and division are carried out as per concept
2. Apply Rational arithmetic	2.1 Calculations on converting fractions to percentage are carried out as per concept 2.2 Calculations on solving simple problems involving direct and inverse proportion are performed as per concept
3. Apply Manipulative skills	3.1 Calculations expressing figures to correct decimal places are performed as per the concept 3.2 Calculations distinguishing between significant and non-significant figures are carried out as per the concept 3.3 Simple estimation of quantities are made and carried out as per concept 3.4 Calculations expressing decimals into fractions and vice versa are performed as per concept 3.5 Calculations expressing numbers in standard form are performed as per the concept
4. Apply Mensuration	4.1 Various units of measurements are identified as per the <i>BSI</i> 4.2 Calculations on <i>converting units</i> from one form to another as per BSI 4.3 Calculations of areas, volumes and perimeters are performed as per the concept 4.4 Calculations expressing dimensions of regular figures using sketches are carried out as per concept