Republic of Rwanda
Ministry of Education

RTB | RWANDA TVET BOARD

TECHNICAL DRAWING

MMPTD401

PRODUCE TECHNICAL DRAWINGS

Competence

RQF Level: 4

Learning Hours 50

Credits: 5

Sector: ICT AND MULTIMEDIA

Trade: Multimedia Production

Module Type: Specific

Curriculum: ICTMMP4001-TVET Level 4 in Multimedia Production

ssue Date: May 2023

<table>
<tr><td>Purpose statement</td><td colspan="5">At the end of this module, trainees will have the skills and knowledge required to succeed in technical drawing after completing this module. They will be able to Prepare for technical drawing, Finalise technical drawings, Create technical drawings, prepare drawing resources and safe and ergonomic working environment. Trainees will be able to draw objects while adhering to technical drawing principles and refining the drawings in accordance with industry standards.</td></tr>
<tr><td>Learning Assumed to be in place</td><td colspan="5">N/A</td></tr>
<tr><td rowspan="6">Delivery modality</td><td colspan="2">Training delivery</td><td>100%</td><td colspan="2">Assessment</td><td>Total 100%</td></tr>
<tr><td colspan="2">Theoretical content</td><td>30%</td><td rowspan="4">Formative assessment</td><td>30%</td><td rowspan="4">50%</td></tr>
<tr><td colspan="2">Practical work:</td><td rowspan="3">70%</td><td rowspan="3">70%</td></tr>
<tr><td>• Group project and presentation</td><td>20%</td></tr>
<tr><td>• Individual project /Work</td><td>50%</td></tr>
<tr><td colspan="3"></td><td colspan="2">Summative Assessment</td><td>50%</td></tr>
</table>

Elements of Competency and Performance Criteria

Elements of competency	Performance criteria
1. Prepare for technical drawing	1.1. Technical drawing requirements and specifications have been appropriately gathered as per the project specifications and industry standards
	1.1. Technical drawing equipment, tools and materials have been appropriately selected in accordance with the project requirements and specifications
	1.2. Drawing workplace has been properly set according to the ergonomic and safety standards
2. Create technical drawings	2.1. Objects and structures have been accurately drawn using geometric constructions as per specifications
	2.2. Multi view object representation has been effectively applied as per technical drawing principles
	2.3. Object has been properly drawn as per scale, notation, labels and symbols
3. Finalise technical drawings	3.1. Technical drawings have been properly reviewed in accordance with industry standards and project requirements
	3.2. Title block details has been properly defined as per the standard

	3.3. Technical drawings are properly organized for presentation in accordance with industry standards and project requirements

Knowledge, Skills, and Attitude

Knowledge	Skills	Attitude
✓ Technical drawing principles, techniques, and tools ✓ Drafting standards and symbols ✓ Basic geometric ✓ Basic mathematics	✓ Drawings skills ✓ Time management and multitasking skills ✓ Communication skills	✓ Creativity ✓ Passion ✓ Curiosity ✓ Professionalism ✓ Respectful ✓ Attentive ✓ Adaptively ✓ Flexibility ✓ Openness ✓ Attention to detail ✓ Adaptability

Course content

Learning outcomes	**At the end of the module the learner will be able to:** **1.** Prepare for technical drawing **2.** Create technical drawings **3.** Finalize technical drawings
Learning outcome 1: Prepare for technical drawing	**Learning hours: 6**
Indicative content	
• **Technical drawing requirements and specifications** ✓ Introduction to Technical Drawing Describing technical drawing Types of Technical Drawings The purpose of technical drawing ✓ Describing a Technical drawing brief Title and Project Information Drawing Purpose Drawing number Drawing scale	

- Drawing Views
- Dimensions
- Tolerances
- Standards and references
- Approval process
- Deadline and Deliverables
- Notes

- **Technical drawing equipment, tools and materials**
  - ✓ Equipment
  - ✓ Tools
    - Mini-draughter
    - T-square
    - Compasses
    - Dividers
    - Set of scales
    - Lettering sets
    - French curves
    - Shape drawing templates
    - Technical pens
  - ✓ Materials
    - Pencils and lead grades
    - Erasers
    - ISO A and B drawing paper series
- **Drawing workplace ergonomic and safety standards**
  - ✓ Seating
  - ✓ Lighting
  - ✓ Ventilation
  - ✓ Workplace layout

Resources required for the learning outcome	
Equipment	**Projector, Drawing Board**
Materials	**Drawing Papers, Erasers,**
Tools	**Mini-Draughter, Compasses, Dividers, Set of Scales, Lettering sets, French Curves, Shape Drawing Templates, Technical pens, Pencils, Pencil lead grades, ISO Drawing papers sizes**
Facilitation techniques & Learning activities	• **Demonstration** • **Trainer guided** • **Presentation**
Formative assessment methods	• **Written assessment** • **Oral Presentation**

Learning outcome 2: Create technical drawings	Learning hours: 36

Indicative content

- **Types of lines used in technical drawing**
  - ✓ Object/visible lines
  - ✓ Hidden lines
  - ✓ Centre lines
  - ✓ Construction lines
  - ✓ Dimension lines
  - ✓ Extension lines
  - ✓ Section lines
  - ✓ Break lines
  - ✓ Leader lines
  - ✓ Border lines
- **Sizes of lines**
  - ✓ Drawing thin lines
  - ✓ Drawing medium lines
  - ✓ Drawing thick lines
- **Geometric constructions**
  - ✓ Drawing line segments
  - ✓ Drawing perpendicular lines
  - ✓ Drawing parallel lines
  - ✓ Bisecting a line segment
  - ✓ Bisecting an angle
  - ✓ Constructing triangles
  - ✓ Constructing circles
    - Using compass
    - Using Two Points
    - Using Three Points
  - ✓ Constructing squares
    - Using a compass
    - Inscribe a square in a given circle
  - ✓ Tangents
    - Tangent to a Circle
    - Tangent to an Ellipse
    - Tangent to a Curve
    - Tangent between Two Circles
- **Multiview object representation**
  - ✓ Describing types of projections
    - Perspective projection
    - Isometric projection
    - Oblique projection
    - Orthographic projection
  - ✓ Determining the views

- The Glass Box Visualization Method

✓ Setting Up the Projection Planes
✓ Projecting the Views
✓ Identifying the hidden lines
✓ Projecting of contours, circles, and arcs

- **Scale, notation, labels and symbols**

✓ Introduction to Scaling
- Scale Factors
- Common Scales
- Scaling Techniques
- Reducing and Enlarging scales

✓ Introduction to Technical Lettering
- Importance of lettering
- Letter Anatomy
- Free Hand Lettering
- Vertical letters
- Inclined letters
- Guide Lines
- Dimensioning lettering

✓ Drawing Sheet Layout
✓ Types of symbols
- Masonry symbols
- Plumbing symbols
- Electrical symbols
- Architectural symbols
- Mechanical symbols
- Special symbols

✓ Introduction to Dimensioning
- Dimensioning Systems
- Dimensioning Conventions and Standards
- Placing notes on a drawing

Resources required for the indicative content	
Equipment	**Projector, Drawing Board**
Materials	**Drawing Papers, Erasers,**
Tools	**Mini-Draughter, Compasses, Dividers, Set of Scales, Lettering sets, French Curves, Shape Drawing Templates, Technical pens, Pencils, Pencil lead grades, ISO Drawing papers sizes**
Facilitation techniques & Learning activities	• **Demonstration** • **Trainer guided**
Formative assessment methods	• **Performance Assessment**

Learning outcome 3: Finalise technical drawings	Learning hours: 8

Indicative content

- **Reviewing Technical drawings**
  - ✓ Drawing conventions and standards
  - ✓ Drawing views Identification
  - ✓ Tolerances and Fits
- **Defining Title block details**
  - ✓ Title
  - ✓ Drawing number
  - ✓ Scale
  - ✓ Units of measurement
  - ✓ Date
  - ✓ Drawing information
  - ✓ Company logo
  - ✓ Title block layout
  - ✓ Standardisation
- **Organising Technical drawings**
  - ✓ Drawing sheet folding techniques
  - ✓ Drawing annotation and labelling
  - ✓ Drawing storage
  - ✓ Digital scanning

Resources required for the indicative content

Equipment	**Projector, Drawing Board**
Materials	**Drawing Papers, Erasers,**
Tools	**Mini-Draughter, Compasses, Dividers, Set of Scales, Lettering sets, French Curves, Shape Drawing Templates, Technical pens, Pencils, Pencil lead grades, ISO Drawing papers sizes**
Facilitation techniques & Learning activities	• **Demonstration** • **Trainer guided**
Formative assessment methods	• **Performance Assessment** • **Written assessment** • **Oral Presentation**

References:

- David A. Madsen, David P. Madsen (2017). Engineering drawing & design (6th ed.). Boston: Cengage Learning
- K. VenkataReddy(2018). Textbook of Engineering Drawing (6th ed.). Hyderabad: BS Publications
- David l. Goetsch, William S. Chalk, john A. Nelson (2000). Technical Drawing(4th ed.). London: Delmar Publishers