Republic of Rwanda
Ministry of Education

RTB | RWANDA TVET BOARD

BASIC DRAWING PRINCIPLES

WIRDP 301

Apply basic drawing principles

Competence

RQF Level: 3

Learning Hours 60

Credits: 8

Sector: Agriculture and food processing

Trade: Water and Irrigation

Module Type: General

Curriculum: AFPWIR3001- TVET Certificate III in water and irrigation

Issue Date: May, 2022

<table>
<tr><td>Purpose statement</td><td colspan="6">This module describes the skills, knowledge and attitude required to apply basic drawing principles.It is intended for learners who have successfully completed nine years basic education, TVET level II in water and irrigation or its equivalent and pursuing TVET level III in water and irrigation or other related qualifications. At the end of this module, learners will be able to use drawing instruments, materials and tools; identify and use lines and symbols of technical drawing; perform 2 and 3 dimensional drawing.Qualified learners deemed competent to this competency may work alone or with others on routine tasks to produce layout of irrigation scheme.</td></tr>
<tr><td rowspan="5">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">100%</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>
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Elements of Competency and Performance Criteria

Elements of competency	Performance criteria
1. Use construction drawing instruments, materials and tools	1.1 Drawing Materials, instruments and equipments are properly identified to accomplish the drawing tasks
	1.2 Drawing materials, instruments and equipments are conveniently used to produce the drawing layout
	1.3 Drawing materials, instruments and equipment are appropriately stored to prevent their damages
	1.4 Instruments and equipment are appropriately maintained to ensure their safety and sustainability
2. Identify and use lines and symbols of technical drawing	2.1 Different types of lines are properly distinguished according to their appropriate representation
	2.2 Different size of lines are correctly demarcated depending on

	the extent of the spatial features
	2.3 Lines are accurately drawn according to their projection techniques
	2.4Drawing symbols are properly identified according to their infield shape and extent
3. Perform 2 and 3 dimensional drawing	3.1 Different types of angles used in technical drawing are properly identified
	3.2 Lines are correctly projected to specify distance from its start to its end points
	3.3 Geometrical field and objects are appropriately drawn to ensure their proper representation
	3.4 Technical drawing or construction plan are appropriately interpreted based on different symbols and their appropriate representation
	3.5 A house plan is correctly drawn to advance the drawing skills

Course content

Learning outcomes	At the end of the module the learner will be able to: 1. Use construction drawing instruments, materials and tools 2. Identify and use lines and symbols of technical drawing 3. Perform 2 and 3 dimensional drawing

Learning outcome 1: Use construction drawing instruments, materials and equipment	Learning hours:15

Indicative content

- Identification of the drawing materials, instruments and tools
- ✓ Construction drawing
- ✓ Drawing terminology
  - Points, lines, planes, sections, views, projection, perspective
- ✓ Drawing instruments for:
  - straight lines, curved lines, measuring distance, measuring angles
- ✓ Tracing instrument
- ✓ Writing instrument
- ✓ Drawing materials
  - Drawing board, sheet, clips and pins
- ✓ Accessories instrument
  - Stencils, Flexible curves, Template, Pantograph, Proportion divider ,Scale ruler, Pencil sharpener, Masking tape
- ✓ Paper forma
  - AO,A1,A2, A3, A4,A5
- ✓ Types of papers
- ✓ Specific use of drawing materials, instruments and tools
- Using the drawing materials, instruments and equipments
  - ✓ Drawing instruments
  - ✓ Tracing instrument
  - ✓ Writing instrument
  - ✓ Drawing materials
  - ✓ Use of accessories instrument
- Storage of the drawing materials, instruments and tools
  - ✓ Storage conditions for the drawing materials, instruments and tools
- Maintenance of instruments and equipment

Resources required for the learning outcome

Equipment	Drawing board
Materials	Papers, Ink, ink pen,Eraser, Pencil lead, pencil, Books, Handouts, drawing sheets, drawing board, ink,Drawing clips , Drawing pins , Bristol paper.
Tools	Compass, protractor, Drawing pins and clips, Compass, Drawing pencil, Rulers, Set squares, Stencils, Flexible curves, Template, Pantograph, Proportion divider , Scale rule, Pencil sharpener, Masking tape, Knife, Scissors,Mini drafter, Clinograph,
Facilitation techniques	• Demonstration and simulation • Individual and group work • Practical exercise • Individualized • Trainer guided • Group discussion
Formative assessment methods	• Written assessment • Oral presentation • Performance assessment • Product based assessment • Project based assessment

Learning outcome 2: Identify and use lines and symbols of technical drawing	**Learning hours:30**
Indicative content	
• Distinguish the different types of lines ✓ Definition of lines used in drawing ✓ Types of lines used in drawing Center line, Hidden line, Break line, Section line, continuous, discontinue • Demarcation of different sizes of lines ✓ Sizes of lines Thin, Medium, Thick ✓ Drawing the lines ✓ Types of lines ✓ Projection of lines Parallel to, inclined to.	

- Identification of the symbols used in construction drawing

✓ Definition of symbols for construction drawing

✓ Functions of symbols for construction drawing

✓ Types of symbols used in construction drawing:

- Masonry, plumbing,electrical,architectural, mechanical,special.

Resources required for the indicative content	
Equipment	Drawing board
Materials	Books, Handout notes, Pencils, Ink pen, Eraser, Sheets
Tools	Compass, Rulers, T square, Pencils, Protractor, Set square
Facilitation techniques	• Demonstration and simulation • Individual and group work • Practical exercise • Individualized • Trainer guided • Group discussion
Formative assessment methods	• Written assessment • Oral presentation • Performance assessment • Product based assessment • Project based assessment

Learning outcome 3: Perform 2& 3 dimensional drawing	**Learning hours:15**
Indicative content	

- Identification of the different types of angles used in technical drawing

✓ Introduction

✓ Types of angles

- Acute, right, obtuse, straight, reflex, full rotation

- ✓ Application of angle

- Projection of lines to specify distance from its start to its end points

✓ Lines and their uses in Projection

✓ Different methods of projections

✓ Types of projections:

- Orthographic, projection, Auxiliary , Isometric, Oblique projection

✓ Application of projections

- Drawing the geometrical figures and objects

✓ Lettering

✓ Types of dimensioning

- Aligned, linear, angled, reference

✓ Types of scales

✓ Presentation of scales

- Interpretation of the technical drawing and construction plan

✓ Introduction on sheet layout and margin

✓ Reading of the title block

- Elements of the title block
- Purpose of title block

✓ Interpretation of legend

✓ Folding drawing sheets

- Drawing of a house plan

✓ Floor plan

✓ Site plan

✓ Elevation

- Front, Back, Left, Right view

✓ Roof plan

✓ Foundation plan ✓ Perspective ✓ Sectioning of a house plan: - Longitudinal section - Transversal Section

Resources required for the indicative content	
Equipment	Drawing table, drawing board, computer, projector
Materials	Books, Handout notes, Pencils, template Books, Eraser, Photos, Video aid, Sheets, paper
Tools/Instrument	Compass, Rulers, T square, Protractor, Scale ruler, Stencil, Pencil sharpener, Pencils, Pencil leads
Facilitation techniques	• Presentation • Demonstration and simulation • Individual and group work • Practical exercise • Individualized • Trainer guided • Group discussion
Formative assessment methods	• Written assessment • Oral presentation • Performance assessment • Product based assessment • Project based assessment

References

1. Md. Roknuzzaman " Engineering drawing for biginners" Department of Civil Engineering, HSTU, Dinajpur Hajee Mohammad Danesh Science and Technology University Dinajpur, Bangladesh, E-mail : mrz.civil@hstu.ac.bd;available on file:///C:/Users/USRE/Downloads/EngineeringDrawingforBeginners.pdf

2. Dr. Amalesh Chandra Mandal, Dr. Md. Quamrul Islam, Mechanical Engineering Drawing, 2007, 1st ed., Dhaka – Associate Printing Press.

3. Wuttet Taffesse, Laikemariam Kassa, Lecture Notes on Engineering Drawing, 2005, 1 st ed., Ethiopia Public Health Training Initiative – Ethiopia Ministry of Education.

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6. Gurcharan Sing, Subhash C. Sharma, Civil Engineering Drawing, 2006, 7th ed., Delhi – Standard Publishers Distributors.

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