NATIONAL CERTIFICATE (VOCATIONAL)

SUBJECT GUIDELINES

DRAWINGS, SETTING OUT, QUANTITIES AND COSTING
NQF Level3

September 2007
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INTRODUCTION

A. What is Drawings, Setting out, Quantities and Costing?
Drawings, Setting out, Quantities and Costing focuses on the construction and building environment and deals with the reading and interpretation of drawings and the production of freehand drawings. Students learn to identify symbols and specifications in drawings to determine information for Setting out and identifying material types to use in construction projects. Students also calculate quantities and perform costing.

B. Why is Drawings, Setting out, Quantities and Costing important in the Building and Civil Construction programme?
The ability to read and interpret drawings and produce freehand drawings serves as a form of communication within construction and building environments. Drawings, Setting out, Quantities and Costing also enables students to describe and use instruments for Setting out and levelling correctly.

C. The link between Drawings, Setting out, Quantities and Costing Learning Outcomes and the Critical and Developmental Outcomes
Students will be able to identify different types of tools to perform Setting out and levelling activities. They will work effectively with the team in activities such as describing construction contracting procedures and processes. Students will also learn the proper way of communicating activities in construction contracting.

D. Factors that contribute to achieving the Drawings and Setting out, Quantities and Costing Learning Outcomes
Students will be able to identify different types of tools to perform Setting out and levelling activities. They will work effectively with the team in activities such as describing construction contracting procedures and processes. Students will also learn the proper way of communicating activities in construction contracting.

• Thorough preparation for teaching and learning activities
• An environment conducive to teaching and learning through effective learner support, motivation, commitment, a positive attitude and interest in the subject
• Student exposure to the construction environment
1 DURATION AND TUITION TIME
This is a one year instruction programme comprising of 200 teaching and learning hours (20 credits). The subject may be offered on a part-time basis provided all assessment requirements set out hereunder are adhered to.

Students with special educational needs (LSEN) must be catered for in a way that eliminates any barriers to learning.

2 SUBJECT LEVEL FOCUS
• Read, interpret and draw construction drawings and specifications
• Theodolites
• Calculation of quantities
• Advanced cost calculations
• Quantity surveying

3 ASSESSMENT REQUIREMENTS
3.1 Internal assessment (25 percent)
All internal assessments refer to continuous assessment, which is college-based assessment. The achievement of Learning Outcomes contributes towards the achievement of the qualification. All internal assessments must be finalised by an assessor declared competent by an accredited provider.

3.1.1 Theoretical Component
The theoretical component will form 80 percent of the internal assessment, based on the fact that the subject requires a broad theoretical knowledge base. Evidence of theoretical assessment must reflect in the Portfolio of Evidence (PoE).

3.1.2 Practical Component
The practical component will form 20 percent of internal assessment. All students must have a PoE for the purpose of assessment.

• Some examples of practical assessments include, but are not limited to:
  ▪ Presentations (lectures, demonstrations, group discussions and activities, practical work, observation, role play, self activity, judging and evaluation)
  ▪ Use of aids
  ▪ Exhibitions
  ▪ Visits
  ▪ Guest speaker presentations
  ▪ Research

• Definition of the term “Structured Environment”
“Structured environment” for the purposes of assessment refers to an actual or simulated workplace, or workshop environment.

Evidence of practical component must be provided in the form of a Logbook with a clear listing of the competencies to be assessed. The following information must be contained in the logbook:

  ▪ Date
  ▪ Task
  ▪ Summary of Task
  ▪ Supervisor's signature
  ▪ Learner's signature
  ▪ Date of completion of task
For the Logbook to be regarded as valid evidence it must be reflected in the student’s PoE. An officially assigned supervisor must sign this off.

- **Evidence in practical assessments**

All evidence pertaining to evaluation of practical work must be reflected in the students’ PoE. The tools and instruments constructed and used for the purpose of conducting such assessments must be clear from evidence contained in the PoE.

3.1.3 **Processing of internal assessment mark for the year**

A year mark out of 100 is calculated by adding the marks of the theoretical component and the practical component of the internal continuous assessment.

3.1.4 **Moderation of internal assessment mark**

Internal assessment is subject to internal and external moderation procedures as set out in the *National Examinations Policy for Further Education and Training College Programmes*.

3.2 **External assessment (50 percent)**

A national examination is conducted annually in October or November by means of a paper set externally and marked and moderated internally. External assessment details are set out in the *Assessment Guidelines: Drawings, Setting out, Quantities and Costing (Level 3)*.

4 **WEIGHTED VALUES OF THE TOPICS**

<table>
<thead>
<tr>
<th>TOPICS</th>
<th>WEIGHTED VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Read, interpret and draw construction drawings and specifications</td>
<td>40%</td>
</tr>
<tr>
<td>2. Theodolites</td>
<td>10%</td>
</tr>
<tr>
<td>3. Calculation of quantities</td>
<td>20%</td>
</tr>
<tr>
<td>4. Advanced cost calculations</td>
<td>15%</td>
</tr>
<tr>
<td>5. Quantity Surveying</td>
<td>15%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

5 **CALCULATION OF FINAL MARK**

Continuous Assessment: \[ \text{Student’s mark/}100 \times 50/1 = \text{a mark out of 50} \] \((a)\)

Theoretical Examination Mark: \[ \text{Student’s mark/}100 \times 50/1 = \text{a mark out of 50} \] \((b)\)

Final Mark: \((a) + (b) = \text{a mark out of 100}\)

All marks are systematically processed and accurately recorded to be available as hard copy evidence for, amongst others, purposes of moderation and verification.

6 **PASS REQUIREMENTS**

A student must obtain at least fifty (50) percent in ICASS and fifty (50) percent in the examination.

7 **SUBJECT AND LEARNING OUTCOMES**

On completion of Drawings, Setting out, Quantities and Costing Level 3 the student should have covered the following topics:

- **Topic 1:** Read, interpret and draw construction drawings and specifications
- **Topic 2:** Theodolites
- **Topic 3:** Calculation of quantities
- **Topic 4:** Advanced cost calculations
- **Topic 5:** Quantity surveying
7.1 Topic 1: Read, interpret and draw construction drawings and specifications

7.1.1 Subject Outcome: Identify drawings and symbols used in construction.

Learning Outcome:
- Identify drawings in terms of types and application for a construction process.
- Explain the purpose of each view in terms of the end product.
- Interpret symbols and abbreviations in terms of their functions and their meanings.
- Explain specification and other notes in terms of work requirements.

7.1.2 Subject Outcome 2: Interpret information from drawing in construction activities.

Learning Outcome:
- Explain from the drawings the side landmarks and the north indicator.
- Interpret the scales and measurements converted in terms of actual dimensions required.
- Interpret the dimensions from the drawings in terms of site requirements.
- Briefly explain the information supplied in the notes section in terms of the engineer's designed purpose.
- List the material identified in terms of ordering material.

7.1.3 Subject Outcome 3: Draw up a building plan according to a prescribed scale.

Learning Outcome:
- Explain and discuss the proposed requirements for a building plan as derived from rough sketches.
- Draw up a site plan according to a scale of 1:500.
- Draw up a floor plan of a small building according to a scale of 1:100 from a given layout.
- Draw different elevations of a building from the floor plan.
- Make a cross sectional sketch which indicates the required measurements.
- List a detailed bill of quantities from information and sketches supplied.

Range: Information of measurements and scale of building plan, prescribed materials: cladding of roof, type of bricks, ceilings, floor covering, plastering, windows, doorframes, roof trusses

7.2 Topic 2: Theodolites

7.2.1 Subject Outcome 1: Explain, adjust the settings, and use the Theodolite.

Learning Outcome:
- Explain the use of a Theodolite.
- Explain and illustrate the setting and adjustment of the Theodolite.
- Use a Theodolite correctly to determine different levels.

7.3 Topic 3: Calculation of quantities

7.3.1 Subject Outcome 1: Calculate quantities based on drawings.

Learning Outcome:
- Calculate quantities needed according to the building drawings and plans.

Range: Cladding of roof, type of bricks, ceilings, floor covering, plastering, windows, doorframes, roof trusses
7.4 Topic 4: Advanced cost calculations

7.4.1 Subject Outcome 1: Calculation of costs based on quantities of materials needed in advanced building plans.

Learning Outcome:
- Determine required quantities of materials according to measurements of advanced building plans.
  Range: Multi level buildings, school, clinic, crèche
- Calculate costs based on determined quantities of material.
  Range: Cladding of roof, type of bricks, ceilings, floor covering, plastering, windows, doorframes, roof trusses

7.5 Topic 5: Quantity Surveying

7.5.1 Subject Outcome 1: Describe and apply quantity surveying techniques.

Learning Outcome:
- Explain quantity surveying principles and techniques in different processes of quantity surveying.
- Apply surveying techniques on a construction site.
  Range: Compass surveying, plain surveying, angular measurements, use of different scales, plain tables, point fixing, calculation of areas, use of a ranging rot, optical square for setting out right angles, calculation of distances, area in hectares, area of circle sector, volume of earth to remove, slope distances between two points

8 RESOURCE NEEDS FOR THE TEACHING OF DRAWING, SETTING, QUANTITIES AND COSTING - LEVEL 3

8.1 Human Resources
Minimum educator qualifications: an acceptable NQF level qualification, registered assessor and on-going top-up training/upskilling requirements

8.2 Physical Resources
Suitable venue to conduct computer classes, teaching aids and pre-designed models, work tables, chairs, chalkboards.

8.3 Teaching and learning resources
Overhead projector, Chalkboard, pre-designed models tools/equipment requirements, teaching and learning materials/resources.

8.4 Other resources
- Electronic distant measuring devices
- Measuring tape
- Theodolite
- Drawing paper