



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

REPORT 191 PROGRAMMES

SUBJECT SYLLABUS

QUANTITY SURVEYING N4

SUBJECT CODE: 2050004

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Syllabus: Quantity Surveying N4

1. General aims

To equip students:

- With knowledge to be able then to manage cost estimations related to civil engineering projects.

2. Specific Aim

- To acquire in-depth knowledge to promote cost estimation and measuring skills supported by a standard system of measuring building work document.

3. Pre-requisite

- A student must have passed National Vocational Certificate (L4) in Building and Civil Construction or N3 with Building Science and Building and Civil Technology as a subjects.
- Grade 12 passed with mathematics and science

4. Duration

- Full-time: 7.5 hours per week. This instructional offering may also be offered part-time.

5. Evaluation

- Evaluation is conducted continuously by means of term tests and class tests. Integrated Continuous Assessment (ICASS) mark of 40% as well as a minimum examination mark of 40% are required to pass the minimum instructional offering.

6. Learning content

- **WEIGHTING:** Recall, comprehension, application, analysis, synthesis and evaluation of learning content are important aspects in determining a student's knowledge and understanding of the learning content of the instructional offering.

Knowledge and Understanding	Applying	Analysing / Synthesis and Evaluating
10 - 20	30 – 40	30 – 40

7. Promotional Mark for student

- ICASS 40%
- External Exam 60%

Syllabus: Quantity Surveying N4

MODULES	WEIGHTING
1. Quantity Surveying in construction industry	20
2. Office procedures related to the production of the Bill of Quantities	10
3. Recording of measurements	10
4. Measurement of 4.1 Foundation 4.2 Super-structure 4.3 Roof-structure 4.4 Door 4.5 Window 4.6 Plain opening Note: The examiner will choose anyone of these sub-modules for assessment purpose.	40
5 Working up	10
6 Price analysis and estimating	10
TOTAL	100

Module 1: Quantity Surveying in Construction industry

General Aim

On completion of this module, the student should be able to comprehend and have sound knowledge of what is Quantity Surveying and its important role in the construction Industry.

LEARNING CONTENT	LEARNING OUTCOMES The student must be able to :
Introduction to quantity surveying and its role and duties in the construction industry.	<ul style="list-style-type: none"> • Describe the functions and duties of a Quantity Surveyor.
Quantity surveying documents.	<ul style="list-style-type: none"> • Analyse quantity surveying documents. • List and explain the following quantity surveying documents. <ul style="list-style-type: none"> - Bill of quantities - Interim payment certificate - Final account certificate - Specification - Condition of contract - Contract drawings - Standard system of measuring building work
Standard system of measurements, (Bill of Quantity and its role in construction project.)	<ul style="list-style-type: none"> • Interpret standard system of measurement and compile the role of Bill of Quantities. • List and explain the objects of the standard system of building work. • List the functions of standard system. • Explain the purpose of the standard system.

Module 2: Office procedures (Bill of Quantities).

General Aim

On completion of this module, the student should be able to describe the office procedures in relation to production of the bill of quantities.

LEARNING CONTENT	LEARNING OUTCOMES The student must be able to:
Quantity Surveying Terminologies	<ul style="list-style-type: none">• Describe the following Quantity Surveying terminologies.<ul style="list-style-type: none">- Circular work- Measured net- Variation order- Interim money- Retention fund- Casting up- Reducing- Drawings- Interim valuations- Contingencies
Office duties relating to production of the bill of quantity	<ul style="list-style-type: none">• Describe the following tasks performed by a quantity surveyor<ul style="list-style-type: none">- Query list- Collection- Waste calculation- Side cast- Checking- Taking off list- Checklist- Taking off- Working up- Ditto- Reference notes- Extra Over• Explain advantages and disadvantages of Bill of Quantities.

Module 3: Recording of measurements.

General Aim

On completion of this module, the student should be able to apply the development of measurement skills devolves on the correct interpretation of measuring rules.

LEARNING CONTENT	LEARNING OUTCOMES The student must be able to:
Principles and techniques of measurements	<ul style="list-style-type: none"> • Describe the difference between Trade - by- Trade and the group method of taking off. • Explain the function of the dimension paper columns: <ul style="list-style-type: none"> - Timesing - Dimension - Squaring - Description • Demonstrate the booking of dimension according to the rules of measurement for the following: <ul style="list-style-type: none"> - Forms of dimension - Bracketing of descriptions - Timesing - Dotting on - Deductions and addition items - Adding on - Alterations - Sign posting • Calculate the centreline or mean girth
Sketching/ free hand drawings	<ul style="list-style-type: none"> • Show by means of a free hand sketches the difference between cornice and skirting. • Sketch the section through one brick foundation wall.

	<ul style="list-style-type: none">• Describe why it is necessary to sketch free hand in good proportions.• Sketch the section of a half truss with open eaves.• Sketch the section through a section of window.• Sketch the section through manhole.• Sketch the section through a septic tank
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|| Module 3 – Recording of measurements

Module 4

Sub-module 4.1: Measuring of Substructure

General Aim

- The module aims to enable the students to apply construction technology and interpret construction drawings.

LEARNING CONTENT	LEARNING OUTCOMES The student must be able to:
Measuring (Foundation).	<p>Measure using the following specification ,note: (size varies)</p> <p>Earthwork : Clean the building site beyond the external brick walls. Excavated soil must be used for filling.</p> <p>Concrete : Size varies Masonry : Ordinary brickwork built in 1:4 cement mortar and the full description of the type of brick.</p> <p>Waterproofing: Damp-proof sheeting reference must be laid between the hard-core filling and the concrete surface bed.</p> <p style="text-align: center;">&</p> <ul style="list-style-type: none"> • Prepare measurements of sub-structure from the following take off list:- <ul style="list-style-type: none"> - Site clearance - Excavations - Risk of collapse - Keeping excavation free of water - Concrete footing - Foundation wall - Backfilling - Cart away - Hard Core - Damp proof membrane Facing

Sub-module 4.2: Measuring (Super-structure)

General Aim

- The module aims enable the student to begin a complete understanding of construction technology on the common building and civil engineering projects.

LEARNING CONTENT	LEARNING OUTCOMES The student must be able to:
Measuring (Superstructure).	<p>Measure using the following specifications, note: (size varies)</p> <ul style="list-style-type: none"> - 15 Mpa surface bed concrete - Brickwork in stretcher bond 1:4 cement mortar - External face brick - Internal fair faced - 19mm granolithic floor finish - 75mm granolithic skirting - 6mm rhino board ceiling - 38 x 38 brandering - H-section cover strips - 75mm core cornice - 2 coats of paint on the ceiling <p style="text-align: center;">&</p> <p>Measure the superstructure elements and finishing's using the following take off list: -</p> <ul style="list-style-type: none"> - Damp proof course - Surface bed - Brick wall - External finishes - Facings - Internal finishes - Fair facing - Floor - Skirting - Ceiling - Cornice - Painting

Sub-module 4.3: Measuring of roof-structure

General Aim

- The student must show the booking of dimensions in a neat and ordinary way using roofing methods of taking off.

LEARNING CONTENT	LEARNING OUTCOMES The student must be able to:
Measuring (Roof structure)	<p>Measure using the following specification ,note: (size varies)</p> <ul style="list-style-type: none"> - All timber for the trusses are 38x114mm pre-treated SA Pine - Trusses are spaced 750 c/c - 114mm x 38mm wall plate - 52mm x 76mm sawn purlins - 76 x 76 WSAP purlin - 600mm over lag at eaves - fibre cement sheet roof covering - fibre cement ridge - 15 x 200mm fibre ridge <p>30° pitch</p> <ul style="list-style-type: none"> - 220 mm <ul style="list-style-type: none"> • Measure gable brickwork Measure rainwater goods and roof covering. <p style="text-align: center;">&</p> <p>Prepare a measuring list for measuring roof from the following take off list:-</p> <ul style="list-style-type: none"> - Wall - Beam filling - Wall plate - Trusses - Roof ties - Purlins - Covering - Ridging - Fascia & badge boards - Gutters - Down pipe

Sub-module 4.4: Measurement (Door)

General Aim

- The student must be able to interpret door drawing and apply the booking of door dimensions in a neat way carpentry trade method of measuring.

LEARNING CONTENT	LEARNING OUTCOMES The student must be able to:
Measuring (Door)	<p>Measure using the following specification ,note: (size varies)</p> <ul style="list-style-type: none"> - Sizes varies but it must be framed, ledged, braced and batten door - 70 x 100 merati door frame - External face brick - soldier course lintel externally -Internal plastered -75mm x 100mm standard precast lintel - Granothic threshold and steps - 76 x 19mm meranti skirting - 2 coats pva paint <p style="text-align: center;">&</p> <ul style="list-style-type: none"> • Measure different types of doors, its frame and its adjustments by making use of the following <p>take off list:-</p> <ul style="list-style-type: none"> - Door - Door Finish - Frame (built in) - Paint <p>Adjustments:</p> <ul style="list-style-type: none"> - Deduct wall - External wall finish - Internal wall finish

|| Module 4.4 – Door measurement

Sub-module 4.5: Measurement (Window)

General Aim

- To apply knowledge and competencies using window drawing and develop a detailed understanding of window taking off.

LEARNING CONTENT	LEARNING OUTCOMES The student must be able to:
Measuring (Window)	<p>Measure using the following specification, note: (size varies)</p> <ul style="list-style-type: none">- 927 x 264 x 3 clean glass- face brick externally- Plaster internally- 25 Mpa in situ concrete two courses high. <p style="text-align: center;">&</p> <ul style="list-style-type: none">• Measure window and its frame with adjustments using the following take off list:-<ul style="list-style-type: none">- Window- Glass- Painting- Building in <p>Adjustments:</p> <ul style="list-style-type: none">- Brickwork- External wall finish- Internal wall finish- Lintel- Internal reveals- Internal sill- External reveals- External sill

Sub-module 4.6: Measuring (Plain opening)

General Aim

- To provide students with a basic understanding of measuring plain opening.

LEARNING CONTENT	LEARNING OUTCOMES The student must be able to:
Measuring (plain opening)	<p>Measure using the following specification ,note: (size varies)</p> <ul style="list-style-type: none"> -Sizes varies but it must be framed, ledged, braced and batten door - 70 x 100 merati door frame - External face brick - soldier course lintel externally -Internal plastered -75mm x 100mm standard precast lintel - Granothic threshold and steps - 76 x 19mm meranti skirting - 2 coats pva paint <p>Measure plain opening including finishing's using the following: take off list:-</p> <p>Adjustments</p> <p>Deduct :</p> <ul style="list-style-type: none"> - wall - External facings - Internal plaster <p>Add :</p> <ul style="list-style-type: none"> - Threshold - Reveals - Lintel

Module 5: Working Up

General Aim

- To provide students with a basic understanding of doing Working up

LEARNING CONTENT	LEARNING OUTCOMES The student must be able to:
Square measured work	<ul style="list-style-type: none">• Calculate the volumes, areas, length etc. contained in the dimension column and the answer entered in the squaring column• Indicate double line under the answer• Show that waste collections and collection have been checked• Show the page number on the dimension paper in the description column.• Illustrate “run through “on the description
Abstract and bill measured work	<ul style="list-style-type: none">• Describe the rules for abstracting and the method of using abstract paper• Describe the rules of Billing and elaborate on the method of using the bill paper

Module 6: Price analysis and estimating

General Aim

- To estimate construction costs building material, plant and labour.

LEARNING CONTENT	LEARNING OUTCOMES The student must be able to:
Cost estimating	<ul style="list-style-type: none"> • Define cost and its difficult groups. • List typical expenses incurred by a small contractor to build a house. • Estimate material costs to build a masonry house • Investigate and explain productivity rates • List all construction costs building material, plant and labour. • Define earning and explain its different categories. • Calculate profit/loss of the project • Calculate areas of different shapes • Calculate number of bricks and amount of mortar to build a ½ brick wall • Calculate number of bricks and amount of mortar to build a 1 brick wall • Calculate the number of bricks and sand to build the wall. • Calculate the number of bricks required to build a gable end. • Calculate the concrete mixture proportions.