

REPUBLIC OF SOUTH AFRICA

SYLLABUS

FOR

CARPENTRY AND ROOFING THEORY N2

CODE NUMBER: 11022192

Examination Instruction no. 14/97

DATE OF IMPLEMENTATION:
September 1997

FIRST EXAMINATION DATE:
November 1997

CARPENTRY AND ROOFING THEORY N2

1. AIMS

1.1 General aims

The student must, after having successfully completed CARPENTRY AND ROOFING THEORY N2, have enough knowledge to meaningfully integrate with the building industry's training programme.

1.2 Specific aims

1.2.1 This course is designed to offer 80% general content coverage and 20% specific content coverage.

1.2.2 The 80% content aims to enable the student to:

- * Be conversant with the setting out of buildings
- * Understand and describe roof construction theory
- * Comprehend dormer and bay-window roof construction
- * Comprehend roof light construction

1.2.3 The 20% content coverage of the Carpentry section aims to enable the student to:

- * Draw (freehand) and evaluate different ceiling constructions
- * Draw (freehand) and describe wall panelling and partitioning with regard to fixing and construction
- * Be conversant with centering, shoring and formwork
- * Identify different types of doors; the construction and hanging procedure of doors
- * Discuss and describe, with the aid of drawings, the constructional detail of timber floors
- * Do relevant trade calculations

1.2.4 The 20% content coverage of the Roofing section aims to enable the student to:

- * Be conversant with the characteristics, compatibility, uses and design of the common waterproofing materials used in sheetmetal work by the roofer
- * Be conversant with the characteristics, compatibility, uses and design and development of

the common roofcovering materials used in industry

- * Be conversant with the most common waterproofing materials in use in the roofing industry
- * Identify, describe and name the uses of the common tools used by the roofer.
- * Identify the different types of gutters, describe the fixing methods and sundry fittings, as well as compare the suitable application of different sizes and profiles of gutters
- * Do relevant trade related calculations

2. DURATION OF INSTRUCTIONAL OFFERING

Full time: One trimester
 Part time: One trimester

3. EVALUATION

The students must be evaluated continually.

4. EXAMINATION

4.1 One three hour examination paper, comprising 100 marks and covering the complete syllabus (taking into account the 80/20 split between the general and specific content) will be written at the end of the instructional offering.

THE SETTING OF QUESTIONS AND THE ALLOCATION OF MARKS MUST BE AS FOLLOWS:

GENERAL	80%
CARPENTRY	20%
ROOFING	20%

STUDENTS MUST ANSWER THE GENERAL AND EITHER CARPENTRY OR ROOFING QUESTIONS

4.2 Students must obtain at least 40% in the examination to pass the instructional offering.

4.3 Knowledge, comprehension, application and analysis, synthesis and evaluation (ASE) are important aspects in determining the level of difficulty and should be as follows:

KNOWLEDGE	COMPREHENSION	APPLICATION	ASE
60%		30%	10%

5 GENERAL INFORMATION

5.1 All work must comply with:

- * The latest National Building Regulations
- * All relevant SABS codes
- * All drawings to be freehand and in good proportion

5.2 The correct use of suitable technical and subject terminology must be stressed.

5.3 Neat, labelled freehand drawings must be made when drawings are required. The student's artistic ability is not to be evaluated.

5.4 The student should be taught to relate the length of his answer to the marks allocated to the question.

5.5 All safety aspects applicable to the learning content must be brought to the attention of the students.

5.6 The weighted value of a module:

- * Gives an indication of the percentage of the total content of the work which is covered by the module
- * Gives an indication of the percentage of the time available for the instructional offering, which is to be spent on the module
- * Gives an indication of the percentage of the total of the marks for an examination paper, which is to be allocated to the module

6. LEARNING CONTENT

6.1 The modules for Carpentry and Roofing N2 consist of the following:

General content (80%) for both CARPENTRY and ROOFING

MODULE	THEME	WEIGHTED VALUE
GENERAL		(TOTAL 80%)
1.	SETTING OUT OF BUILDINGS	10
2.	ROOF CONSTRUCTION	20
3.	ROOF COVERINGS	15
4.	CEILINGS	8
5.	DORMER ROOF CONSTRUCTION	15
6.	ROOF LIGHT CONSTRUCTION	12
CARPENTRY		(TOTAL 20%)
7.	WALL PANELLING, PARTITIONS, DOORS AND FRAMES	14
8.	CENTERING, FORMWORK AND SHORING	6
ROOFING		(TOTAL 20%)
9.	SHEETMETAL WORK	8
10.	WATERPROOFING OF ROOFS AND RAINWATER GOODS	8
11.	ROOFER'S TOOLS	4

7. DETAILED SYLLABUS

GENERAL

MODULE 1: SETTING OUT OF BUILDINGS

On completion of this module, the student should be able to:

1.1 Describe the sequence of operations used to set out a single storey building

1.2 Identify and explain the use of various setting-out equipment:

- * Tape measures
- * Measuring rods
- * Spirit level
- * Water level (clear plastic tube)
- * Straight edges
- * Plumb bob
- * Dumpy level

1.3 Explain the following:

- * Bench marks
- * Datum pegs
- * Setting-up builders profiles

1.4 Differentiate between the following:

- * Sketch
- * Design
- * Working (locality, site and layout) plans

MODULE 2: ROOF CONSTRUCTION

On completion of this module, the student should be able to:

- 2.1 Describe and illustrate with the aid of drawings, the construction of the following roof trusses:
 - * Lean-to
 - * W or fink
 - * Howe
 - * Attic
- 2.2 Identify and name the different members of the roof trusses listed in paragraph 2.1
- 2.3 Describe and illustrate with the aid of drawings, the layout of the following methods of roof construction
 - * On site manufactured trusses (with nails and bolts)
 - * Factory engineered trusses (with connector plates)
- 2.4 Describe and illustrate with the aid of drawings, the construction methods and layout of on site manufactured roof trusses of the following:
 - * Rectangular roof with gable ends
 - * Rectangular roof with hip ends
 - * L-shaped roof with gable, hip, flying hip and valley.
- 2.5 Explain with the aid of drawings how to determine the lengths of parts of roof trusses listed in paragraph 2.1 by means of:
 - * Geometrical construction
 - * Roofing square
- 2.6 Describe and illustrate with the aid of drawings, the construction of:
 - * Open eaves
 - * Closed eaves

MODULE 3: ROOF COVERING

On completion of this module, the student should be able to:

3.1 List the physical properties and the typical applications of the following roof coverings:

- * Secret fixed sheets
- * Natural slates
- * Fibre cement slates
- * Thatching
- * Clay tiles
- * Metal tiles
- * Wood shingles
- * Asphalt shingles

3.2 Describe and illustrate with the aid of drawings the minimum pitch and fixing methods of the roof covering materials listed in paragraph 3.1

3.3 Describe the specific criteria to be followed when storing the roof covering materials listed in paragraph 3.1

3.4 Indicate by means of drawings the construction details for valleys and ridges when using the roof covering materials listed in paragraph 3.1

3.5 Discuss the characteristics, properties, applications and fixings of the following waterproofing materials:

- * Plastics
- * Mastics
- * Acrylic
- * Asphalt
- * Coatings (brush application which hardens)

MODULE 4: CEILINGS

On completion of this module, the student should be able to:

4.1 Describe and illustrate with the aid of drawings the fixing details for the following ceilings:

- * Suspended
- * Boarded
- * Timber

4.2 Compare the ceiling systems as listed in paragraph 4.1 with regard to uses and finishes

MODULE 5: DORMER ROOF CONSTRUCTION

On completion of this module, the student should be able to:

- 5.1 Differentiate and illustrate with the aid of drawings, between the following types of dormer roof constructions:
 - * Dormer roof construction with a flat roof
 - * Dormer roof construction with a pitched roof
 - * Segmental dormer construction
- 5.2 Describe and illustrate with the aid of drawings the construction of the dormers as listed in paragraph 5.1
- 5.3 Describe and illustrate with the aid of drawings, bay window roof construction for the following conditions:
 - * Separate roof construction (over bay window)
 - * Extension of main roof construction
- 5.4 Describe with the aid of drawings the flashing and sealing to dormer construction as listed in paragraph 5.1

MODULE 6: ROOF LIGHT CONSTRUCTION

On completion of this module, the student should be able to:

- 6.1 Explain and illustrate with the aid of drawings, how rooflights manufactured of the following materials, are fitted:
 - * Metal
 - * Timber
 - * Plastic

- 6.2 Discuss with the aid of drawings the application and integration of the rooflights referred to in paragraph 6.1:
 - * The type of roof covering
 - * The type of roof construction

- 6.3 Describe with the aid of drawings the flashing and sealing to rooflights construction as listed in paragraph 5.1

CARPENTRY

MODULE 7: WALL PANELLING, PARTITIONING, DOORS AND DOORFRAMES

On completion of this module, the student should be able to:

- 7.1 Distinguish with the aid of drawings the following types of wall panelling:
 - * Processed board
 - * Strip
 - * Framed
- 7.2 Describe with the aid of drawings the fixing and finishing details (including grounds) of the panelling listed in paragraph 7.1
- 7.3 Describe with the aid of drawings the fixing and finishing details of the following partitions:
 - * Drywall construction (timber frame) with board facings
 - * Drywall construction (metal frame) with board facings
- 7.4 Describe with the aid of drawings the finishing details of partitions with regard to:
 - * Corners
 - * Door openings
 - * Floors
 - * Ceilings
- 7.5 Describe with the aid of drawings the construction details of doorframes:
 - * With top and sidelights
 - * With and without a cill
 - * Solid jamb linings and methods of fixing

7.6 Identify and describe the following doors:

- * Stable
- * Panel
- * Batten (ledged; ledged and braced; framed ledged and braced)
- * Flush
- * Glazed

7.7 Describe the procedure of the hanging of the doors listed in paragraph 7.6

7.8 Describe with the aid of drawings a standard flush sliding door

7.9 Explain the setting up procedure for timber and metal door frames

MODULE 8: CENTERING, FORMWORK AND SHORING

On completion of this module, the student should be able to:

- 8.1 Explain the reasons for using centering in arches
- 8.2 Explain with the aid of drawings the use and construction details of centering with regard to open or closed laggings
- 8.3 Explain the concept formwork and the different materials used
- 8.4 Describe with the aid of drawings the constructional details of the formwork for the following elements:
 - * Columns
 - * Beams
 - * Floors
 - * Walls
 - * Staircases
- 8.5 Discuss the basic requirements for formwork with regard to:
 - * Containment
 - * Strength
 - * Leakage
 - * Accuracy
 - * Handling
 - * Re-use/finishing
 - * Access for building material
 - * Storage
- 8.6 Explain the concept shoring and its uses
- 8.7 Explain with the aid of single line diagrams the following shoring types and the application thereof:
 - * Vertical
 - * Raking
 - * Horizontal

ROOFING

MODULE 9: SHEETMETAL WORK

On completion of this module, the student should be able to:

- 9.1 Explain the characteristics, uses and compatibility of the following materials as applicable to the roofing trade:
- * Copper
 - * Lead
 - * Galvanised iron
 - * Aluminium
 - * Zinc
 - * Brass
- 9.2 Explain the different methods of joining any of the materials listed in paragraph 9.1
- 9.3 Develop the sheetmetal patterns for:
- * Stepped flashing
 - * Valley gutter
 - * Vent pipe flashing
- 9.4 Illustrate by means of freehand drawings the fixing methods of the flashings listed in paragraph 9.3

MODULE 10: WATERPROOFING OF ROOFS AND RAINWATER GOODS

On completion of this module, the student should be able to:

- 10.1 Explain the different profiles for gutters and its common applications
- 10.2 Describe the four common materials used in the manufacture of gutters
 - * Fibre cement
 - * uPVC
 - * Aluminium
 - * Galvanised iron
- 10.3 Describe the different fixing methods and sundry fittings used with gutters
- 10.4 Discuss the standard specifications employed when purchasing gutters
- 10.5 Describe and distinguish between the concepts of waterproofing and weatherproofing
- 10.6 Describe the process of applying the following waterproofing systems:
 - * Membrane reinforced liquid
 - * Self adhesive membrane
 - * Heat-fusion membrane

MODULE 11: ROOFER'S TOOLS

On completion of this module, the student should be able to identify and explain the uses of the following roofer's tools:

- * Scriber
- * Hand saw
- * Slater's hammer
- * Slate ripper
- * Parallel sheers
- * Bentley slate cutter
- * Disc cutter
- * Fein jigsaw
- * Drills and drill bits
- * Hand guided band saw
- * Crowbar