



education

Department:
Education
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATES (VOCATIONAL)

SUBJECT GUIDELINES

CONSTRUCTION MATERIALS

NQF LEVEL 2

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INTRODUCTION

A. What is Construction Materials?

Construction Materials provides training to students in construction materials, construction activities and construction processes. It equips students to become part of the mainstream construction industry.

B. Why is Construction Materials important in the Building and Civil Construction programme?

Construction Materials provides learners with practical means to understand and become part of the mainstream construction industry.

C. The link between the Construction Materials Learning Outcomes and the Critical and Developmental Outcomes

Students will be able to identify different types of construction materials to perform various construction activities. They will work effectively with the other team members to complete activities such as identifying and describing different construction material characteristics. Construction Materials also prepares students to communicate understanding for the different uses of appropriate construction materials in required circumstances.

D. Factors that contribute to achieving the Construction Material Learning Outcomes

- Thorough preparation for teaching and learning activities
- An environment conducive to teaching and learning through effective learner support, motivation, commitment and a positive attitude
- An interest in Construction Materials

CONSTRUCTION MATERIALS – LEVEL 2

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1 DURATION AND TUITION TIME

This is a one-year instructional programme comprising 200 teaching and learning hours. The subject may be offered on a part-time basis provided the student meets all the assessment requirements.

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

2 SUBJECT LEVEL FOCUS

The student will be able to:

- Identify, describe and use of different materials in construction.
- Explain and describe reinforcements.
- Procure materials, tools and equipment.
- Explain porosity, capillarity and bulking of sand.
- Distinguish between clay, refractory and concrete bricks.
- Discuss the use of timber and other materials.

3 ASSESSMENT REQUIREMENTS

3.1 Internal assessment (50 percent)

Internal assessment refers to continuous assessment which is college based. The achievement of Learning Outcomes counts towards the achievement of a qualification. All internal assessments must be finalised by an assessor who has been declared competent by an accredited service provider.

3.1.1 Theoretical component

The theoretical component forms 40 percent of the internal assessment mark.

Internal assessment of the theoretical component in Construction Materials Level 2 takes the form of observation, class questions, group work, informal group competitions with rewards, individual discussions with students, class, topic and semester tests and internal examinations. Lecturers can observe students when marking exercises from the previous day and asking class questions.

Assignments, case studies and tests can be completed at the end of a topic. Tests and internal examinations must form part of the internal assessment.

3.1.2 Practical component

The practical component forms 60 percent of the internal assessment mark.

Practical components include applications and exercises. All practical components must be indicated in a Portfolio of Evidence (PoE).

Internal assessment of the practical component in Construction Materials Level 2 takes the form of assignments, practical exercises, case studies and practical examinations in a simulated building environment.

Students may complete practical exercises daily. Assignments and case studies can be completed at the end of a topic. Practical examinations can form part of internal practical assessment.

- **Some examples of practical assessments include, but are not limited to:**

- A. Presentations (lectures, demonstrations, group discussions and activities, practical work, observation, role-play, independent activity, synthesis and evaluation)
- B. Exhibitions by students
- C. Visits undertaken by students based on a structured assignment task
- D. Research
- E. Task performance in a "Structured Environment"

• Definition of the term “Structured Environment”

For the purposes of assessment, “Structured Environment” refers to a simulated workplace or workshop environment. Activities in the simulated workplace or environment must be documented in a logbook with a clear listing of the competencies to be assessed. The following information must be contained in the logbook:

- Nature of department or environment in which practical component was achieved
- Learning Outcomes
- Activities in the environment with which to achieve the Learning Outcomes
- Time spent on activities
- Signature of lecturer or supervisor and student

For the logbook to be regarded as valid evidence, it must be signed by an officially assigned supervisor.

• Evidence in practical assessments

All evidence pertaining to evaluation of practical work must be reflected in the students’ Portfolio of Evidence (PoE). The tools and instruments constructed and used to conduct these assessments must be clear from the evidence contained in the Portfolio of Evidence (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 (40 percent) and the practical component (60 percent) of the internal continuous assessment (ICASS).

3.1.4 Moderation of internal assessment mark

Internal assessment is subjected to internal and external moderation procedures as set out in the *National Examinations Policy for FET College Programmes*.

3.2 External assessment (50 percent)

A National Examination is conducted annually in October or November by means of a paper(s) set and moderated externally. A practical component will also be assessed.

External assessment details and procedures are set out in the *Assessment Guidelines: Construction Materials (Level 2)*.

4 WEIGHTED VALUES OF TOPICS

TOPICS	WEIGHTED VALUE
1. Materials in Construction	20
2. Introduction to Reinforcement	20
3. Materials, Tools and Equipment	10
4. Porosity, Capillarity and Bulking of Sand	10
5. Clay, Refractory and Concrete Block Bricks	20
6. Timber	10
7. Other Materials	10
TOTAL	100

5 CALCULATION OF FINAL MARK

Internal assessment mark: Student’s mark/100 x 50 = a mark out of 50 (a)

Examination mark: Student’s mark/100 x 50 = a mark out of 50 (b)

Final mark: (a) + (b) = a mark out of 100

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

6 PASS REQUIREMENTS

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

7 SUBJECT AND LEARNING OUTCOMES

On the completion of Construction Materials Level 2, the learner should have covered the following topics:

- Topic 1: Materials in Construction
- Topic 2: Introduction to Reinforcement
- Topic 3: Materials, Tools and Equipment
- Topic 4: Porosity, Capillarity and Bulking of Sand
- Topic 5: Clay, Refractory and Concrete Block Bricks
- Topic 6: Timber
- Topic 7: Other Materials

7.1 Topic 1: Materials in Construction

Subject Outcome: Identify, describe and use natural building materials.

Learning Outcomes:

The student should be able to:

- Identify and select relevant natural building materials.
- Describe building, plaster and concrete sand in terms of physical appearance.
- Describe building, plaster and concrete sand in terms of sieve analysis or grading envelope for compliance to project specifications.

Range: Making mortar for building and plaster activities, making concrete bedding materials for pipes and paving blocks

7.2 Topic 2: Introduction to Reinforcement

Subject Outcome: Explain reinforcement and its application.

Learning Outcomes:

The student should be able to:

- Explain different types of reinforcement.
- Explain various structures where reinforcement is used.

7.3 Topic 3: Materials, Tools and Equipment

Subject Outcome 1: Measure and order materials, tools and equipment.

Learning Outcomes:

The student should be able to:

- Measure and compile a list of materials needed.
- Order and purchase appropriate materials, tools and equipment.

Subject Outcome 2: Maintain tools and equipment.

Learning Outcomes:

The student should be able to:

- Store tools and equipment according to housekeeping requirements.
- Adhere to health and safety requirements for the maintenance and storage of tools and equipment.

7.4 Topic 4: Porosity, Capillarity and Bulking of Sand

Subject Outcome 1: Define density concepts and complete density experiments.

Learning Outcomes:

The student should be able to:

- Calculate density of various materials based on formulae derived from density concepts.
- Carry out experiments to determine the density of different materials.

Subject Outcome 2: Use instruments and apparatus to measure.

Learning Outcome:

The student should be able to:

- Use instruments and apparatus to measure different quantities.
Range: Measuring scale, measuring tape, buckets, wheelbarrows, boxes and materials in cubic metres (5/10 cubic metre truck)

Subject Outcome 3: Complete and explain experiments on capillarity and porosity of sand.

Learning Outcomes:

The student should be able to:

- List and describe porous and non-porous materials.
- Explain and complete an experiment on capillarity action.
- Explain and complete an experiment on bulking of sand.
- Describe and calculate water cement ratio.

7.5 Topic 5: Clay, Refractory and Cement Block Bricks

Subject Outcome: Describe clay, refractory and cement block bricks and explain their correct uses.

Learning Outcomes:

The student should be able to:

- Distinguish between clay, refractory and cement block bricks.
- Identify the ingredients used to manufacture clay, refractory and cement block bricks.
- Identify different types and sizes clay, refractory and cement block bricks.
- Indicate and motivate where different types and sizes of clay, refractory and cement block bricks can be used successfully.

7.6 Topic 6: Timber

Subject Outcome 1: Explain timber structures and properties.

Learning Outcomes:

The student should be able to:

- Explain and name different classes of timber.
- List and explain parts of tree trunk properties.

Subject Outcome 2: Describe methods of seasoning timber and timber preservation.

Learning Outcomes:

The student should be able to:

- Name and explain methods of drying timber.
- Calculate percentage moisture content using the relevant formula.
- Define and explain preservation of timber and the properties of persevered timber.
- List and explain various classes of preservatives and their application.

7.7 Topic 7: Other Materials

Subject Outcome 1: Explain what lime is and use lime correctly as part of a mortar mixture.

Learning Outcomes:

The student should be able to:

- Explain and classify various types of lime.
- Explain the uses and properties of lime.
- Use lime correctly in the mixing of mortar.

Subject Outcome 2: Explain and use different types of paint.

Learning Outcomes:

The student should be able to:

- Describe the qualities of paint.
- Explain different types of paints available and their applications.
- Apply the correct types of paint on different surfaces.

Subject Outcome 3: Explain the purpose of wood glue and apply it correctly.

Learning Outcomes:

The student should be able to:

- Explain the purpose of wood glue.
- Correctly apply and use wood glue.

8 RESOURCE NEEDS FOR THE TEACHING OF CONSTRUCTION MATERIALS – LEVEL 2

8.1 Physical resources

- Classroom
- Teaching aids and pre-designed models and structures
- Work tables, work area, chairs and chalkboards
- Overhead projector

8.2 Human resources

The lecturer should have an acceptable NQF level qualification in Building and Civil Construction and should preferably be a registered assessor. The lecturer should be committed to continually improving and expanding his or her knowledge and skills.

8.3 Other resources

- Budget according to Construction Materials requirements
- Computers
- File and other documents