NATIONAL CERTIFICATE (VOCATIONAL)

SUBJECT GUIDELINES

CONSTRUCTION PLANT AND EQUIPMENT
NQF level 3

September 2007
CONSTRUCTION PLANT AND EQUIPMENT – LEVEL 3

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INTRODUCTION

A. What is Construction Plant and Equipment?
Construction Plant and Equipment is a subject that deals with operating, using and maintaining building and civil construction machinery and plant. It also addresses health and safety regulations related to the use of various machines.

B. Why is Construction Plant and Equipment important in the Building and Civil Construction programme?
Construction Plant and Equipment serves as basis for the Building and Civil Construction sub-field in terms of the performance of various activities especially those that require practical components utilising the services of these plant in their day to day operation.

C. The link between the Construction Plant and Equipment Learning Outcomes and the Critical and Developmental Outcomes
Students will be able to identify and describe different types of tools, equipment, machinery and plant used within Building and Civil Construction. They will work effectively with the team in activities such as interpretation of health and safety programmes, and will use technology appropriately according to requirements of Construction Plant and Equipment.

D. Factors that contribute to achieving the Construction Plant And Equipment Learning Outcomes
Good preparation for teaching and learning activities is essential. Creating a conducive teaching and learning environment by providing effective learner support, motivation, commitment, positive attitude, safety awareness and interest in the Construction Plant and Equipment.
1 DURATION AND TUITION TIME

This is a one-year instructional programme comprising of 200 teaching and learning hours (20 credits). The subject may be offered on a part-time basis provided all of the assessment requirements set hereunder are adhered to.

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

2 SUBJECT LEVEL FOCUS

- Describe machinery and plant used within building and civil construction
- Perform building and civil construction activities using different plant
- Explain and apply health and safety procedures and practices

3 ASSESSMENT REQUIREMENTS

3.1 Internal assessment (50 percent)

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

3.1.1 Theoretical Component

The theoretical component will form 40 percent of the internal assessment. Evidence of theoretical assessment must be reflected in the Portfolio of Evidence (PoE).

3.1.2 Practical Component

The practical component will form 60 percent of the internal assessment.

The practical component in this subject is likely to be taken out of college premises or in a workplace where the relevant equipment is available.

- 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
  - Structured environment

- 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 this 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 (60 percent indicated above) 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: Construction Plant and Equipment (Level 3).

4 WEIGHTED VALUES OF THE TOPICS

<table>
<thead>
<tr>
<th>TOPICS</th>
<th>WEIGHTED VALUES</th>
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<td>3. Preparation and use of shutters for straight and curved walls,</td>
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<td>columns, beams and concrete slabs</td>
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<td>4. Use of handling equipment in construction</td>
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<td>5. Earthmoving equipment</td>
<td>15</td>
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<td>6. Rock drilling equipment</td>
<td>10</td>
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<td><strong>TOTAL</strong></td>
<td><strong>100</strong></td>
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5 CALCULATION OF FINAL MARK

Continuous Assessment: Student’s mark/100 x 50/1 = a mark out of 50 (a)

Theoretical Examination Mark: Student’s mark/100 x 50/1 = 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, 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 Construction Plant and Equipment Level 3 the student should have covered the following topics:

Topic 1: Levelling, grading and lifting equipment.
Topic 2: Concrete batch plant.
Topic 3: Preparation and use of shutters for straight and curved walls, columns, beams, concrete slabs.
Topic 4: Use of handling equipment in construction.
Topic 5 Earthmoving equipment.
Topic 6 Rock drilling equipment.

7.1 Topic 1: Levelling and grading and lifting equipment

7.1.1 Subject Outcome: Describe levelling and grading equipment used on a construction site.

Learning Outcome:
- Describe the operating systems of different types of levelling and grading equipment.
- Describe the advantages of using levelling and grading equipment in construction.
- Describe lifting equipment and its operating systems used in construction.
  Range: Cranes, mobile tower cranes.
- Explain how to use lifting equipment safely and correctly.
  Range: Document interpretations, job instructions, sequence of operations, checks and services, identification of possible risks, preparation and safety of work area, statutory requirements, local body regulations and any other special requirements.

7.2 Topic 2: Concrete batch plant

7.2.1 Subject Outcome 1: Explain concrete batch plant on a construction site.

Learning Outcome:
- Explain the importance and advantages of using concrete batch plant on site.
- Explain the functions of concrete batch plant.
- Describe the operation of concrete batch plant.
- Describe the care and maintenance of concrete batch plant.
- Explain safety standards while using concrete batching plant.

7.3 Topic 3: Preparation and use of shutters for straight and curved walls, columns, beams and concrete slabs

7.3.1 Subject Outcome 1: Describe materials and procedures needed for concrete shutters.

Learning Outcome:
- Describe different materials for use of formwork.
- Describe safety measures and precautions for formwork.
- Describe the procedures for setting out and preparing shutters for straight and curved walls, columns, beams and concrete slabs.

7.3.2 Subject Outcome 2: Plan, set out and prepare shutters for straight and curved walls, columns, beams and concrete slabs.

Learning Outcome:
- Plan, set out and prepare shutters for straight and curved walls, columns, beams and concrete slabs.
7.3.3 Subject Outcome 3: Demonstrate the ability to erect concrete shutters.

Learning Outcome:
- Erect shutters for straight and curved walls, columns, beams and concrete slabs according to building plan layout.

7.4 Topic 4: Use of handling equipment in construction

7.4.1 Subject Outcome 1: Identify, describe, use and maintain different handling equipment in construction.

Learning Outcome:
- List and describe different types of handling equipment used in construction.
  \textit{Range: Concrete mixers, compacters, cutting machines, dumpers.}
- Explain the importance of using handling equipment in construction.
- Use different types of handling equipment correctly in construction.
- Describe the care and maintenance of different handling equipment.

7.5 Topic 5: Earthmoving equipment

7.5.1 Subject Outcome 1: Identify and describe different earthmoving concepts, equipment and its uses, in the construction industry.

Learning Outcome:
- Explain “earthworks” and related concepts and its relevance as applied in building and construction.
- Identify different equipment within a plant.
- Describe the uses of different equipment within a plant.

7.6 Topic 6: Rock drilling equipment

7.6.1 Subject Outcome 1: Describe and use different rock drilling equipment in the construction industry.

Learning Outcome:
- Explain the concept “drilling” and its relevance in building and construction.
- Describe the uses of rock drilling equipment
- Use rock drilling equipment correctly in construction

8 RESOURCE NEEDS FOR THE CONSTRUCTION PLANT AND EQUIPMENT - LEVEL 3

8.1 Human Resources
Minimum educator qualifications in building and civil construction, competent assessor and on-going top-up training/up-skilling requirements.

8.2 Physical Resources
Accredited workshop with the appropriate machines and equipment to achieve required outcomes, teaching aids and pre-designed models, work tables, work area, chairs, chalkboards.

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