CIVIL TECHNOLOGY

Grade 12 Civil Technology (Specialization) learner

It is extremely important that you practise your drawings throughout the year and do plenty of freehand sketches to understand the various components of civil drawings. Practical work is of outmost importance to link the theory to it.

Subject Requirements

Three fields of specialisation are offered in this field:

- Civil Services
- Construction
- Woodworking

Content Checklist

Below is a checklist you should use to ensure that you have covered the Grade 12 content of Civil Technology in full.

NB: Remember that a Generic part as well as a Specific part will be covered. The list below indicates the topics of Civil Technology according to the specialization.

Generic Section for Construction, Woodworking and Civil Services:

- **APPLICATION OF THE OHS ACT PERTAINING TO GENERAL HEALTH AND SAFETY IN THE WORKPLACE:**
  - Scaffolding
  - Handling of material
  - Floors and stairs with open sides
  - Builders hoist
  - Ladders
- **MATERIALS**
  Preservation and sustainability of materials:
  - Painting
  - Curing
  - Electroplating
  - Powder coating
  - Galvanising
- **TOOLS AND EQUIPMENT**
  Identification, proper use and care of the following specialised tools:
  - Dumpy level
  - Laser level
  - Multi detector
- **JOINING**
  Identify and explain the uses of:
  - Bolts and nuts
  - Rawl bolts
  - Plastic plugs
  - Rawl plugs
- **GRAPHICS AS MEANS OF COMMUNICATION (GENERIC)**
  Interpretation of advanced drawings:
  - Site plan, floor plan and elevation of multi storey buildings.
  - Basic drawing symbols relating to the built environment in accordance with the SANS for building drawings.

CIVIL SERVICES:

- **Occupational Health and Safety Act 85 Of 1993 (OHS)**
  Safeguarding of openings and the use of safety harness.
  Safety risk associated with deep manholes eg. fumes and gasses
- **MATERIALS (specific)**
  Explain chemical reactions between dissimilar materials.
- **EQUIPMENT AND TOOLS (specific)**
  pumps, drain cleaning tools, machine tools and testing tools
- **Graphics as means of communication (specific)**
  Pattern development
- **Quantities (specific)**
  Calculate quantities of bricks, volume of concrete, etc
- **Joining (specific)**
  Identify and explain the uses of fixing agents
  Methods of cutting, joining and securing pipe connections.

  Subject Specific Content For Civil Services
- **Construction Associated With Civil Services**
  Brick and concrete ring manholes. Setting out levels and trenches
- **Cold Water Supply**
  Uses and installation of valves, joints and fittings for pipes, water saving devices and repairs and alterations to existing pipe work
- **Hot Water Supply**
  Working priniciples, Installation, regulations, advantages and disadvantages of heating units and faults in water systems
- **Storm Water**
  Methods of disposing large quantities of water.
- **Hot Water Supply**
  Working principles, installation, regulations, advantages and disadvantages of heating units and faults in water systems
- **Roof Work**
  Installation of rectangular gutters
- **Storm Water**
  Methods of disposing large quantities of water
- **Drainage (Sewarage) Above and Below Ground**
  Drainage system. Septic tanks, vacuum tanks and French drains.
- **Sanitary Fitments**
  Working parts, working principles, labelling of sectional sketches.

CONSTRUCTION:

- **Occupational Health and Safety Act 85 Of 1993 (OHS) -**
  General health and safety in the workplace, scaffolding, handling of material, floors and stairs with open sides, builders hoist, ladder
- **Materials**
  Application and uses of concrete, properties of ferrous and non-ferrous metals, cladding, glass
- **Equipment and Tools**
  Safe handling, application and care of construction machinery
- **Graphics As Means Of Communication**
  Detailed scale of drawings
- **Quantities**
  Calculation of the quantity of materials for a building.
- **Joining**
  Identify and explain the uses of bolts and nuts.
  Roof trusses to brickwork, wall plate to wall, concrete to steel.
- **Brick work:** Cavity walls - Scale drawings, Paving, Beam filling
- **Excavations**
  Safety factors and regulations. Shuttering for shallow trenches
- **Foundations**
  Pile foundations
- **Concrete floors:** Rib and Block floors
- **Reinforcement in concrete:** Floors, Beams & Columns
- **Construction:** Roofs
- **Formwork**
  Beams, Beams with attached floor slab, Straight flight of stairs
  Properties of materials, The use of wedges in form work
- **Arches:** Construction detail, Advantages, disadvantages
- **Staircase**
  Vertical cross- through a straight flight of concrete staircase.
- **Construction:** Plaster and Screed
- Plaster, Alternative finishes to walls, Screed

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- **Rib and Block Floor**
  Sketches, advantages, installation method and precautions.
- **Reinforcement**
  Floors, beams, columns, cavity walls and defect due to shuttering.
- **Plaster and Screed**
  Application, skimming, admixtures, finishes bagging.
- **Screed:** preparation, application, purpose and admixtures.

WOODWORKING:

Materials
The procedure, properties tested and the advantages of grading timber. Methods of applying various types of preservatives on timber. Factors to be considered in the selection of timber

Equipment And Tools
Safe handling and care of portable and fixed woodworking machines.

Graphics as Means of Communication (Specific)
Scale drawing of exploded and assembled isometric view of woodworking joints. Sketches of line diagrams of roof trusses

- **Quantities**
  Calculation of material required for a small building. Development of a cutting list for a bedroom cupboard from floor to ceiling.
- **Joining**
  Identify and explain the uses of fixing agents
  Methods of joining woodworking items to structures.
  Application, uses and drawings of woodworking (joints (exploded and assembled views)

SUBJECT SPECIFIC CONTENT FOR WOODWORKING

- **Casement**
  Sketch of the vertical section through the transom and adjacent members. Identification and drawing of the external elevation of a double casement with fanlights within a frame
- **Doors**
  Drawing of front elevations, horizontal and vertical sections and constructional details of purpose made external doors.
- **Wall Panelling and Cupboards**
  Front elevation, horizontal section and vertical section of wall panelling up to ceiling. Joining of strip boards.

  Working drawings of a built-in and free standing cupboard up to ceiling height
- **Roofs**
  Scale drawings and constructional detail of roof trusses
- **Centering**
  Sketches, methods of construction and erection of centres for flat and semi-circular arches with maximum 1 200 mm span
- **Formwork**
  Properties of materials used for formwork.

  Drawing of formwork and methods of erecting and supporting horizontal and vertical concrete structures. Wedges in formwork
- **Shoring**
  Single line diagrams showing the components of the shoring for a three storey building
- **Ironmongery**
  Identification and use of door and cupboard locks used in woodworking
- **Suspended Timber Floor**
  Sketch of a plan and the vertical section through a suspended timber floor
- **Ceiling**
  Constructional details around the trap door of a ceiling
- **Staircase**
  Line diagram with details of a straight flight of stairs with a landing and a staircase well with a half landing
- **Roofs**
  Regulations, purpose and methods of installation of roofs with coverings. Roof underlay. Methods of joining smaller trusses to full trusses. Identification and uses.

Assessment

School based assessment (25%) 100 marks

Assessment Task	Mark Allocation	Weighting for Term	Weighting for Year	Term 1	Term 2	Term 3	Term 4
Assignment	Minimum 50	Term 1 - 100%	10%	1			
Mid Year Examination	200	Term 2 - 100%	7.5% (25%)		1		
Preparatory Examination	200	Term 3 - 100%	7.5%			1	
Final Examination	200	Term 4 - Examination 100%	50% (75%)				1
PAT Phase 1 = 20 Marks 100 PAT Phase 2 = 80 Marks	100	PAT Term 4 - 25%	25%				1

Practical Assessment Task (PAT) (25%): 100 marks External Examination: (50%) 3 hours 200 marks

SCAN ME! Civil Technology: Woodworking Overview

SCAN ME! Civil Technology: Construction Overview

SCAN ME! Civil Technology: Civil Services Overview

Complete construction of RCC-DESIGN
https://www.youtube.com/watch?v=_A7_tfvt0UY

Basic Wood Joints
https://www.youtube.com/watch?v=i-F7tTNRH_04