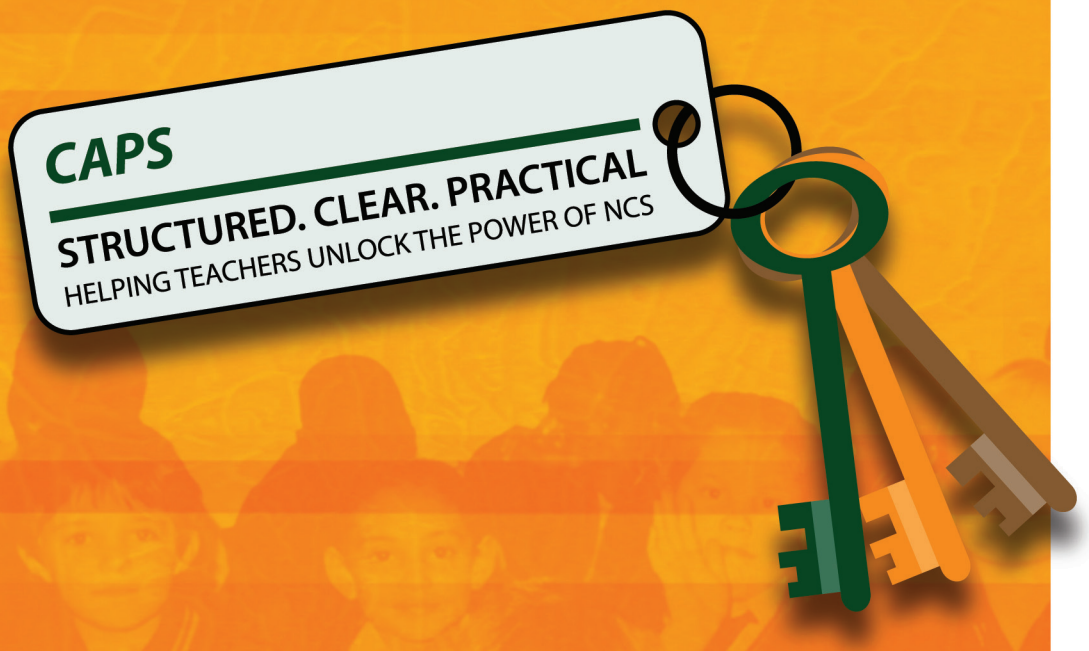
CIVIL TECHNOLOGY

National Curriculum Statement (NCS)

Curriculum and Assessment Policy Statement



Further Education and Training Phase Grades 10-12

basic education
Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

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CURRICULUM AND ASSESSMENT POLICY STATEMENT
GRADES 10-12

CIVIL TECHNOLOGY

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FOREWORD BY THE MINISTER

Our national curriculum is the culmination of our efforts over a period of seventeen years to transform the curriculum bequeathed to us by apartheid. From the start of democracy we have built our curriculum on the values that inspired our Constitution (Act 108 of 1996). The Preamble to the Constitution states that the aims of the Constitution are to:

- heal the divisions of the past and establish a society based on democratic values, social justice and fundamental human rights;
- improve the quality of life of all citizens and free the potential of each person;
- lay the foundations for a democratic and open society in which government is based on the will of the people and every citizen is equally protected by law; and
- build a united and democratic South Africa able to take its rightful place as a sovereign state in the family of nations.

Education and the curriculum have an important role to play in realising these aims.

In 1997 we introduced outcomes-based education to overcome the curricular divisions of the past, but the experience of implementation prompted a review in 2000. This led to the first curriculum revision: the *Revised National Curriculum Statement Grades R-9* and the *National Curriculum Statement Grades 10-12* (2002).

Ongoing implementation challenges resulted in another review in 2009 and we revised the *Revised National Curriculum Statement* (2002) to produce this document.

From 2012 the two 2002 curricula, for *Grades R-9* and *Grades 10-12* respectively, are combined in a single document and will simply be known as the *National Curriculum Statement Grades R-12.* The *National Curriculum Statement for Grades R-12* builds on the previous curriculum but also updates it and aims to provide clearer specification of what is to be taught and learnt on a term-by-term basis.

The *National Curriculum Statement Grades R-12* accordingly replaces the Subject Statements, Learning Programme Guidelines and Subject Assessment Guidelines with the

(a) Curriculum and Assessment Policy Statements (CAPS) for all approved subjects listed in this document;

(b) *National policy pertaining to the programme and promotion requirements of the National Curriculum Statement Grades R-12*; and

(c) *National Protocol for Assessment Grades R-12.*

MRS ANGIE MOTSHEKGA, MP
MINISTER OF BASIC EDUCATION

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SECTION 1

INTRODUCTION TO THE CURRICULUM AND ASSESSMENT POLICY STATEMENTS FOR CIVIL TECHNOLOGY GRADES 10-12

1.1 Background

The *National Curriculum Statement Grades R-12 (NCS)* stipulates policy on curriculum and assessment in the schooling sector.

To improve implementation, the National Curriculum Statement was amended, with the amendments coming into effect in January 2012. A single comprehensive Curriculum and Assessment Policy document was developed for each subject to replace Subject Statements, Learning Programme Guidelines and Subject Assessment Guidelines in Grades R-12.

1.2 Overview

(a) The *National Curriculum Statement Grades R-12 (January 2012)* represents a policy statement for learning and teaching in South African schools and comprises the following:

(i) Curriculum and Assessment Policy Statements for each approved school subject;

(ii) The policy document, National policy pertaining to the programme and promotion requirements of the National Curriculum Statement Grades R-12; and

(iii) The policy document, National Protocol for Assessment Grades R-12 (January 2012).

(b) The *National Curriculum Statement Grades R-12 (January 2012)* replaces the two current national curricula statements, namely the

(i) Revised National Curriculum Statement Grades R-9, Government Gazette No. 23406 of 31 May 2002, and

(ii) National Curriculum Statement Grades 10-12 Government Gazettes, No. 25545 of 6 October 2003 and No. 27594 of 17 May 2005.

(c) The national curriculum statements contemplated in subparagraphs b(i) and (ii) comprise the following policy documents which will be incrementally repealed by the *National Curriculum Statement Grades R-12 (January 2012)* during the period 2012-2014:

(i) The Learning Area/Subject Statements, Learning Programme Guidelines and Subject Assessment Guidelines for Grades R-9 and Grades 10-12;

(ii) The policy document, National Policy on assessment and qualifications for schools in the General Education and Training Band d, promulgated in Government Notice No. 124 in Government Gazette No. 29626 of 12 February 2007;

(iii) The policy document, the National Senior Certificate: A qualification at Level 4 on the National Qualifications Framework (NQF), promulgated in Government Gazette No.27819 of 20 July 2005;

(iv) The policy document, An addendum to the policy document, the National Senior Certificate: A qualification at Level 4 on the National Qualifications Framework (NQF), regarding learners with special needs, published in Government Gazette, No.29466 of 11 December 2006, is incorporated in the policy document, National policy pertaining to the programme and promotion requirements of the National Curriculum Statement Grades R-12; and

(v) The policy document, An addendum to the policy document, the National Senior Certificate: A qualification at Level 4 on the National Qualifications Framework (NQF), regarding the National Protocol for Assessment (Grades R-12), promulgated in Government Notice No.1267 in Government Gazette No. 29467 of 11 December 2006.

(d) The policy document, *National policy pertaining to the programme and promotion requirements of the National Curriculum Statement Grades R-12*, and the sections on the Curriculum and Assessment Policy as contemplated in Chapters 2, 3 and 4 of this document constitute the norms and standards of the *National Curriculum Statement Grades R-12.* It will therefore, in terms of *section 6A* of the *South African Schools Act, 1996 (Act No. 84 of 1996,)* form the basis for the Minister of Basic Education to determine minimum outcomes and standards, as well as the processes and procedures for the assessment of learner achievement to be applicable to public and independent schools.

1.3 General aims of the South African Curriculum

(a) The *National Curriculum Statement Grades R-12* gives expression to the knowledge, skills and values worth learning in South African schools. This curriculum aims to ensure that children acquire and apply knowledge and skills in ways that are meaningful to their own lives. In this regard, the curriculum promotes knowledge in local contexts, while being sensitive to global imperatives.

(b) The National Curriculum Statement Grades R-12 serves the purposes of:

- equipping learners, irrespective of their socio-economic background, race, gender, physical ability or intellectual ability, with the knowledge, skills and values necessary for self-fulfilment, and meaningful participation in society as citizens of a free country;
- providing access to higher education;
- facilitating the transition of learners from education institutions to the workplace; and
- providing employers with a sufficient profile of a learner's competences.

(c) The National Curriculum Statement Grades R-12 is based on the following principles:

- Social transformation: ensuring that the educational imbalances of the past are redressed, and that equal educational opportunities are provided for all sections of the population;
- Active and critical learning: encouraging an active and critical approach to learning, rather than rote and uncritical learning of given truths;
- High knowledge and high skills: the minimum standards of knowledge and skills to be achieved at each grade are specified and set high, achievable standards in all subjects;
- Progression: content and context of each grade shows progression from simple to complex;

- Human rights, inclusivity, environmental and social justice: infusing the principles and practices of social and environmental justice and human rights as defined in the Constitution of the Republic of South Africa. The National Curriculum Statement Grades R-12 is sensitive to issues of diversity such as poverty, inequality, race, gender, language, age, disability and other factors;
- Valuing indigenous knowledge systems: acknowledging the rich history and heritage of this country as important contributors to nurturing the values contained in the Constitution; and
- Credibility, quality and efficiency: providing an education that is comparable in quality, breadth and depth to those of other countries.

(d) The National Curriculum Statement Grades R-12 aims to produce learners that are able to:

- identify and solve problems and make decisions using critical and creative thinking;
- work effectively as individuals and with others as members of a team;
- organise and manage themselves and their activities responsibly and effectively;
- collect, analyse, organise and critically evaluate information;
- communicate effectively using visual, symbolic and/or language skills in various modes;
- use science and technology effectively and critically showing responsibility towards the environment and the health of others; and
- demonstrate an understanding of the world as a set of related systems by recognising that problem solving contexts do not exist in isolation.

(e) Inclusivity should become a central part of the organisation, planning and teaching at each school. This can only happen if all teachers have a sound understanding of how to recognise and address barriers to learning, and how to plan for diversity.

The key to managing inclusivity is ensuring that barriers are identified and addressed by all the relevant support structures within the school community, including teachers, District-Based Support Teams, Institutional-Level Support Teams, parents and Special Schools as Resource Centres. To address barriers in the classroom, teachers should use various curriculum differentiation strategies such as those included in the Department of Basic Education's *Guidelines for Inclusive Teaching and Learning* (2010).

1.4 Time Allocation

1.4.1 Foundation Phase

(a) The instructional time in the Foundation Phase is as follows:

SUBJECT	GRADE R (HOURS)	GRADES 1-2 (HOURS)	GRADE 3 (HOURS)
Home Language	10	8/7	8/7
First Additional Language		2/3	3/4
Mathematics	7	7	7
Life Skills • Beginning Knowledge • Creative Arts • Physical Education • Personal and Social Well-being	**6** (1) (2) (2) (1)	**6** (1) (2) (2) (1)	**7** (2) (2) (2) (1)
TOTAL	**23**	**23**	**25**

(b) Instructional time for Grades R, 1 and 2 is 23 hours and for Grade 3 is 25 hours.

(c) Ten hours are allocated for languages in Grades R-2 and 11 hours in Grade 3. A maximum of 8 hours and a minimum of 7 hours are allocated for Home Language and a minimum of 2 hours and a maximum of 3 hours for Additional Language in Grades 1-2. In Grade 3 a maximum of 8 hours and a minimum of 7 hours are allocated for Home Language and a minimum of 3 hours and a maximum of 4 hours for First Additional Language.

(d) In Life Skills Beginning Knowledge is allocated 1 hour in Grades R-2 and 2 hours as indicated by the hours in brackets for Grade 3.

1.4.2 Intermediate Phase

(a) The instructional time in the Intermediate Phase is as follows:

SUBJECT	HOURS
Home Language	6
First Additional Language	5
Mathematics	6
Natural Sciences and Technology	3,5
Social Sciences	3
Life Skills • Creative Arts • Physical Education • Personal and Social Well-being	**4** (1,5) (1) (1,5)
TOTAL	**27,5**

1.4.3 Senior Phase

(a) The instructional time in the Senior Phase is as follows:

SUBJECT	HOURS
Home Language	5
First Additional Language	4
Mathematics	4,5
Natural Sciences	3
Social Sciences	3
Technology	2
Economic Management Sciences	2
Life Orientation	2
Creative Arts	2
TOTAL	**27,5**

1.4.4 Grades 10-12

(a) The instructional time in Grades 10-12 is as follows:

SUBJECT	TIME ALLOCATION PER WEEK (HOURS)
Home Language	**4.5**
First Additional Language	**4.5**
Mathematics	**4.5**
Life Orientation	**2**
A minimum of any three subjects selected from **Group B** Annexure B, Tables B1-B8 of the policy document, *National policy pertaining to the programme and promotion requirements of the National Curriculum Statement Grades R-12,* subject to the provisos stipulated in paragraph 28 of the said policy document.	**12 (3x4h)**
TOTAL	**27,5**

The allocated time per week may be utilised only for the minimum required NCS subjects as specified above, and may not be used for any additional subjects added to the list of minimum subjects. Should a learner wish to offer additional subjects, additional time must be allocated for the offering of these subjects.

SECTION 2

2.1 What is Civil Technology?

Civil Technology focuses on concepts and principles in the built environment and on the technological process. It embraces practical skills and the application of scientific principles. This subject aims to create and improve the built environment to enhance the quality of life of the individual and society and to ensure the sustainable use of the natural environment. The subject focuses on three main areas, namely:

- civil services;
- construction; and
- woodworking.

The table below indicates the main topics in Civil Technology.

Safety
Materials
Equipment
Graphics and communications
Terminology
Applied mechanics
Construction
Civil services
Quantities
Joining

2.2 Topics to be Studied in Civil Technology:

- Methods of construction of joinery
- Methods of installation of joinery
- Designing of wooden structures for buildings
- Methods of sustaining wooden installations in a building
- Tools and equipment used in the building industry
- Woodwork joints
- Roof construction
- Materials: properties and uses
- Construction: from foundation to wall plate level
- Applied mechanics

- Steel structures
- Quantity surveying
- Graphics and communication
- Sewage and storm-water disposal
- Water supply
- Sanitary fittings and fitments
- Hot water systems
- Reticulation systems

2.3 Specific Aims

The aim of the subject Civil Technology is to develop the skills levels of learners from Grade 10-12 to such an extent that they will be able to enter a career pathway at a Further Education and Training college or a university immediately after obtaining the National Senior Certificate . Learners will be ready to enter into learnerships or apprenticeships that will prepare them for a trade test.

Through the integrated completion of theoretical work and the practical assessment tasks (PAT) skills in respect of the following will be developed:

- safe working practices;
- good housekeeping;
- first aid practices;
- interpretation of working drawings;
- erection of structures;
- working with accurate measurements; and
- workshop practice.

Knowledge of subject principles, combined with applied skills, equips the Civil Technology learner with a unique set of skills, placing her or him apart from other learners and in a category much desired by industry, tertiary institutions and entrepreneurs. Learners with Civil Technology as a subject fare markedly better during the first two years at tertiary level when studying engineering than learners without this background, giving them an advantage when studying engineering.

2.4 Requirements for Civil Technology as a Subject

The following is of the utmost importance in the subject:

1. Each learner should have access to:
    - a textbook;
    - a workshop with tools and equipment;
    - a variety of civil engineering and building industry magazines and reference books;
    - drawing equipment;
    - a calculator;
    - measuring equipment, tools and consumable items for civil technology; and
    - a computer with simulation and CAD software (strongly recommended).
2. The school should subscribe to at least one or two building and civil engineering magazines for the teacher to keep abreast with the latest developments in the built environment. These magazines could also be lent out to learners (in the same way as library books). These resources must be readily available in the classroom or in the library.
3. The teacher should have a variety of reference books, charts and brochures in the classroom to stimulate the learners' interest in the subject.
4. The teacher should have access to the internet to be able to source, download and print relevant and new information, as the built environment is a dynamic industry with new trends and developments. The teacher should also have electronic mail facilities, as new information from subject advisors and other sources need to be downloaded via electronic mail.
5. Schools offering Civil Technology must have a well - equipped workshop for learners to complete the PATs.
6. Subject advisers must provide regular support to the teachers.

2.5 Career Opportunities

Learners offering Civil Technology will opt for one of the following career opportunities:

- apprenticeship to become an artisan;
- continued studies at a college in the NC(V) in a vocational career pathway;
- higher education at a university of technology;
- higher education at a university (to study engineering);
- working as an entrepreneur or working with an entrepreneur; or
- higher education to study technical education in order to become a teacher of technology.

Career and life experience opportunities for learners with a foundation in Civil Technology include those of:

- carpenter and joiner;
- bricklayer;
- tiler;
- painter;
- plumber;
- drainlayer;
- roof specialist;
- cabinet maker;
- shutter hand;
- building inspector;
- quantity surveyor;
- architect;
- draughtsman;
- building surveyor;
- building technician;
- civil engineer;
- structural engineer; or
- civil technology teacher.

SECTION 3

3.1 Content Outline

TOPIC	GRADE 10	GRADE 11	GRADE 12
SAFETY	Occupational Health and Safety Act (OHSA) - Personal and general safety for power and hand tools. Safe storage of material and equipment.	OHSA - Personal and general safety. Safe storage of material. Fire-fighting and prevention of fires	Application and regulation of OHSA pertaining to personal safety, hand and power tools
GRAPHICS AND COMMUNICATIONS	Line work, freehand sketches of tools, orthographic projections, introduction to CAD, symbols used in building drawings. Section through sub-structure of a dwelling.	Sketches of building components, vertical section of building and building components, isometric views of parts of buildings. Section through super-structure of a dwelling. CAD application	Sketches of building components, vertical section of building and building components, isometric views of parts of buildings. Section through entire building. Completion of plan for a dwelling. CAD application
MATERIALS	Properties of materials: metals; timber; concrete and concrete products; bricks and plastics.	Use of materials in the built environment	The sustainability of materials according to their appropriate use and nature (preservation, painting, curing, electroplating, powder-coating and galvanising)
EQUIPMENT	Use, safe handling and care of hand and power tools: basic site equipment, measuring and setting out tools, bricklaying tools, woodwork tools	Use, safe handling and care of hand and power tools: plastering tools, construction machinery and plumbing tools	Use, safe handling and care of hand and power tools: specialised tools and construction machinery
TERMINOLOGY	Correct application of terminology in every lesson	Correct application of terminology in every lesson	Correct application of terminology in every lesson

TOPIC	GRADE 10	GRADE 11	GRADE 12
APPLIED MECHANICS	Knowledge and understanding of SI units The difference between mass and weight Bow's notation Graphical determination of solutions to problems using parallelogram, triangle and polygon of forces Introduction to beams. Calculation of reactions with **(maximum TWO point loads without uniformly distributed load (UDL) NO OVERHANGS OR CANTILEVERS)**	Graphic determination of the solutions for force diagrams. Application of Bow's notation Beams: Calculation of reactions at the supports **(max THREE point loads and ONE UDL. NO OVERHANGS OR CANTILEVERS)** Calculation of shear forces and bending moments Drawing of diagrams of shear force and bending moments Calculation of centroids of squares, rectangles and triangles only (Supply formulae sheet to learners.)	Graphic determination of the nature and magnitude for the different members in force diagrams of roof frames and structures, including cantilever frames (only vertical loads) Beams: Reactions at the supports-calculation of reactions at the supports **(max THREE point loads and ONE UDL. NO OVERHANGS OR CANTILEVERS).** Calculations and diagrams of shear force and bending moments Use of the correct units and terminology Centroids of irregular shapes consisting of a combination of squares, rectangles or triangles only (Supply formulae sheet to learners.)
CONSTRUCTION	Concrete: mix proportions, grades, testing Strip foundations Brickwork: stretcher bond, junctions and quoins Waterproofing: materials for floors and walls Excavations: setting out, timbering Woodworking: hard and soft woods, seasoning, sizes Finishing: material, thickness and finishes to screeds	Concrete: beams, columns and cantilevers Reinforcements: materials function and position. Plaster: mix proportion and application. Brickwork and block work: English bond, junctions and quoins, cavity walls, lintels Waterproofing: for windows, doors and walls. Formwork: materials, columns, stairs, scaffolding Excavations: types and uses of shoring. Woodworking: mouldings, doors and windows, preservation, cutting list Finishing: plastering, tiling, and painting	Concrete: grades, piling: purpose and positioning, ready-mixed concrete, rib and block floor, reinforcing in concrete, drywall construction Brickwork and block work: brick bonds; stretcher and English, quoins and 'T' junctions, beam filling, arches Waterproofing: for floors, roofs and walls Formwork: materials, scaffolding. Woodworking: mouldings, ceiling construction, doors and windows, preservation, cutting list, roof trusses Roof covering: Types and methods of installation Finishing: plastering, tiling, painting, and special finishes

TOPIC	GRADE 10	GRADE 11	GRADE 12
CIVIL SERVICES	Materials, storage and distribution of cold water supply Introduction to sewerage: materials, regulations and abbreviations Introduction to storm - water disposal: materials and regulations Introduction to electrical systems: kick pipes only	Basic plumbing in a house, materials, hot water systems Sewerage layout for a building Calculation of invert levels Colour coding Disposal of storm - water and regulations Positioning of distribution board and conduit	Cold water supply, plumbing for a house, materials, hot water systems, solar systems Alternate fresh water supplies Sewerage layout for a building Sewage disposal Regulations, sectional views Water traps Conservancy and septic tanks French drains Disposal of storm - water and regulations Electrical symbols
QUANTITIES	Conversion: SI units Quantities for the sub- structure of a dwelling	Method of extracting quantities for the sub - structure and super - structure of a dwelling	Method of extracting quantities for a one - bedroom dwelling
JOINING	Joining other materials to brickwork Materials used to join timber to timber Methods of joining materials used for cold water supply	Methods of joining timber and aluminium windows and doors to brickwork Woodworking joints Copper pipe joints: capillary and compression	Joining roof trusses to brickwork Bolts, screws, nails, gang nails, galvanised straps Thread joints, PVC adhesives

3.2 Content Outline per Term

GRADE 10 - TERM 1

Four hours of contact time is prescribed per week. Two and a half hours is intended for theory and one and a half hours for practical work and completion of the PAT. (**One double period per week is required for practical work)**

Week	Topics	Content
1 week (4 hours)	**SAFETY**	OHSA *Personal safety*: Safety attire from head to foot *General safety*: Hand tools and power tools. Safe storage and housekeeping of material on site and in the workshop Explanation of the PAT document to learners
2 weeks (8 hours)	**GRAPHICS AND COMMUNICATION**	*Use and care of the following drawing instruments*: pencils, eraser, T-square, drawing board, protractor, scale rulers, set squares, compass , dividers, drawing clips, paper sizes Line types conforming to South African National Standards (SANS) Scale drawings of three-dimensional and orthographic drawings of objects used in the built environment
2 weeks (8 hours)	**GRAPHICS AND COMMUNICATION**	Interpretation and application of basic symbols as used in the drawing of floor plans of single-storey dwellings Vertical section through the sub-structure of a single-storey building Introduction to CAD
1 week (4 hours)	**MATERIALS**	Basic uses and properties of materials and ingredients of concrete and mortar; fabricated boards (chip board, gypsum board, hard board, compressed fibre board (supawood), and plywood) hardwood (meranti and saligna) and soft wood (SA pine); bricks (common and face brick); ferrous (mild steel, tin and cast iron) and non-ferrous metals (copper, brass, zinc, aluminium and stainless steel) and plastics (thermo plastic and thermo hardened plastics) used in the built environment. Profiles, properties and uses of flat, square and round steel bars
2 weeks (8 hours)	**EQUIPMENT**	Use, care, maintenance and safe handling of hand tools: *Basic site equipment*: shovels; pick; wheelbarrow; metal pegs *Measuring and setting out tools*: steel tape measure , straight edge, building line, chalk line, steel square (builders), spirit level, transparent pipe level, dumpy level and plumb bob *Bricklaying tools*: brick trowel, float, line block, club hammer, brick hammer, bolster, cold chisel, jointing tools
1 week (4 hours)	**EQUIPMENT**	Use, care, maintenance and safe handling of hand tools: *Woodwork tools*: try square, sliding bevel, marking gauge, trying plane, rip saw, cross-cut saw, mortise chisel, wood rasp, files, cross-peen and claw hammers, and screwdrivers Use, care, maintenance and safe handling of power drill
1 week (4 hours)	**COMPLETION OF FIRST PHASE OF PAT**	

GRADE 10 - TERM 2

Week	Topic	Content
1 week (4 hours)	**EQUIPMENT**	*Use, care, maintenance and safe handling of small plant equipment*: concrete mixer; plate compactor; portable concrete vibrator and jack hammer
2 weeks (8 hours)	**APPLIED MECHANICS**	Knowledge and understanding of SI units The difference between mass and weight Bow's notation Graphic determination of solutions to problems using parallelogram, triangle and polygon of forces Introduction to beams
1 week (4 hours)	**APPLIED MECHANICS**	Calculation of reactions with maximum TWO point loads without UDL (NO OVERHANGS OR CANTILEVERS)
1 week (4 hours)	**CONSTRUCTION**: **CONCRETE**	*Concrete*: Application and mixing proportions of ingredients set out in a table for low, medium and high strength concrete The mixing area, equipment and tools for mixing and placing concrete *Different methods of mixing concrete*: Advantages and disadvantages of hand mixing, machine mixing and ready-mixed concrete
1 week (4 hours)	**CONSTRUCTION**: **CONCRETE**	Procedure to be followed when placing and compacting concrete Methods of placing, levelling and floating concrete The materials, reasons for and methods of curing concrete
1 week (4 hours)	**CONSTRUCTION:** **CONCRETE,** **MORTAR AND SCREED**	The purpose, procedure and apparatus for conducting slump and cube test on concrete Analysis of the outcomes of slump tests *Mortar*: Purpose, uses, ingredients, mixing methods and types of jointing *Screed*: Purpose, uses, ingredients, mixing methods and proportions, types, preparation of surfaces, placing, thickness and finishes of different types of screeds, as well as differentiation between monolithic and bonded screeds
3 weeks (12 hours)	**CONSOLIDATION, MID-YEAR EXAMINATION AND COMPLETION OF SECOND PHASE OF PAT**	

GRADE 10 - TERM 3

Week	Topic	Content
2 weeks (8 hours)	**CONSTRUCTION**: **FOUNDATIONS**	The purpose, dimensions, reasons, regulations, excavations, timbering for strip foundations Sketches of foundations for a single-storey building
1 week (4 hours)	**CONSTRUCTION:** **BRICKWORK**	Sketches to show raking back, toothing and block bonding Sketches of front elevations, end elevations and alternate plan courses of walls built in half and one brick wide walls in stretcher bond. Sketches of alternate plan courses of half and one brick wide stretcher bond walls for T-junctions and corners
1 week (4 hours)	**CONSTRUCTION:** **WATER - PROOFING** **FORMWORK**	Purpose, reasons, regulations, materials, and sketches to show damp proofing for concrete ground floors, basement (advanced construction), cavity walls
1 week (4 hours)	**CONSTRUCTION:** **EXCAVATIONS**	*Methods of setting out foundations and foundation brickwork for a building for excavation*: 3 - 4 - 5 method for setting out square corners and checking squareness, placing and marking of profiles *Excavation*: Excavation methods, methods of maintaining the level of foundations, regulations pertaining to the excavation of trenches, regulations to protect public and workers and timbering for hard, firm, dry loose and wet loose soils
1 week (4 hours)	**CONSTRUCTION:** **WOODWORKING**	*Seasoning of timber*: Definition, reasons, advantages and disadvantages of artificial and natural seasoning *Testing of timber*: Differentiation between mechanical grading and visual grading *Sizes of timber*: Schedule of sizes of timber available for skirtings and quadrant
1 week (4 hours)	**CIVIL SERVICES:** **WATER SUPPLY**	*Topics to be covered*: dams and reservoirs, distribution to households, brief explanation of the natural water cycle *Properties, advantages and disadvantages of materials used in the distribution of cold water*: PVC pipes, copper pipes and galvanised pipes
1 week (4 hours)	**CIVIL SERVICES:** **STORM - WATER**	*Safe disposal of storm-water in the following ways*: roof gutters to water tanks, surface channels, hard surfaces, manholes, onto road kerbs, methods of channelling storm-water to catchments areas Responsibilities of municipalities and regulations with regard to storm-water disposal Knowledge gained from the above to be used in the development of the PAT.
1 week (4 hours)	**CIVIL SERVICES:** **SEWERAGE**	*Introduction to sewerage, covering the following topics* : definition of sewerage, differentiation between sewage and sewerage, differentiation between soil water and waste water, ventilation system, soil vent pipes, water traps and gulley
1 week (4 hours)	**CONSOLIDATION AND COMPLETION OF THE PAT**	

GRADE 10 - TERM 4

Week	Topic	Content
1 week (4 hours)	**CIVIL SERVICES:** **SEWERAGE**	Regulations governing sewerage, abbreviations and symbols used in sewerage systems' Properties, advantages and disadvantages of materials used in a sewerage system: PVC pipes and fittings and cast iron pipes
1 week (4 hours)	**CIVIL SERVICES:** **ELECTRICAL SYSTEM**	Introduction of electrical system in a simple dwelling considering advantages, location and installation of kick pipes Electrical symbols used in floor plans of drawings
2 weeks (8 hours)	**QUANTITIES**	A good understanding of the SI units that must lead to the calculation of: areas, volumes and linear measurements Calculation of all materials required for a sub-structure of a building
1 week (4 hours)	**JOINING: ANCHORS AND SCREWS**	*Anchors*: Identification and uses of nylon anchor, hammer fix nylon anchor and rawl bolts *Screws*: Identification and uses of countersunk head, round head, raised head, drywall screw, coach screw; advantages of using screws rather than nails
1 week (4 hours)	**JOINING:** **NAILS AND** **GLUES**	*Nails*: Identification and uses of round wire, clout nail, steel cut nail; advantages of using nails rather than screws *Glues*: Properties, use, precautions and application of PVA wood glue, contact glue, epoxy glue and mastic sealants
1 week (4 hours)	**JOINING:** **WOOD**	Use and sketches of the following joints: *Housing*: stopped and through, Halving joints: cross half-lap and longitudinal half-lap
3 weeks (12 hours)	**FINAL EXAMINATION AND ASSESSMENT OF PAT**	

GRADE 11 - TERM 1

Four hours of contact time is prescribed per week. Two and a half hours is intended for theory and one and a half hours for practical work and completion of the PAT. (**One double period per week is required for practical work)**

Week	Topic	Content
1 week (4 hours)	**SAFETY AND PAT**	*Safety practices and regulations related to*: construction machinery, site and workshop, excavations, scaffolding, handling of materials, floors and stairs with open sides, builders' hoist, ladders *Fire*: prevention, types, extinguishers, fire hose and sprinkler valve systems, fire triangle causes, preventive measures PAT handout to learners
2 weeks (8 hours)	**GRAPHICS AND COMMUNICATION**	*Labelled and dimensioned to SANS specifications*: developing drawings of elevations, sections and floor plans of buildings selecting doors and windows from catalogues and schedules Application of CAD
1 week (4 hours)	**MATERIALS:** **BLOCKS** **METALS**	*Blocks and block work*: purpose and use: concrete blocks and landscape blocks Profiles, properties and uses of rectangular, square and round tubes
1 week (4 hours)	**MATERIALS:** **GLASS**	Basic properties and uses of glass: sheet, translucent and safety glass Methods of securing glass to doors and windows
1 week (4 hours)	**EQUIPMENT HAND TOOLS**	Identification, uses and care of: *Plastering tools*: plastering trowel, hand hawk and block brush *Plumbing tools*: Stilson (monkey wrench), basin spanner, shifting spanner, pipe cutter, hack-saw and water pump pliers
1 week (4 hours)	**EQUIPMENT POWER TOOLS**	Power tools: *Use, care, safe handling and maintenance of*: portable electric circular saw, angle grinder, portable electric plane and router *Use, care, safe handling and maintenance of construction machinery*: portable concrete vibrator, concrete mixer, Jack hammer, generator to supply electricity
2 weeks (8 hours)	**APPLIED** **MECHANICS**	Graphic determination of solutions for force diagrams applying Bow's notation Beams: Calculation of reactions at the supports **(max THREE point loads and ONE UDL, NO OVERHANGS OR CANTILEVERS)**
1 week (4 hours)	**COMPLETION OF FIRST PHASE OF PAT**	

GRADE 11 - TERM 2

Week	Topic	Content
1 week (4 hours)	**APPLIED MECHANICS**	Graphic determination of solutions, for force diagrams applying Bow's notation Beams: Calculation of reactions at the supports **(max THREE point loads and ONE UDL,NO OVERHANGS OR CANTILEVERS)** Calculation of shear forces and bending moments Drawing of diagrams of shear force and bending moments Calculation of centroids of squares, rectangles and triangles only (Supply formulae sheet to learners.)
1 week (4 hours)	**CONSTRUCTION**: **RE-INFORCEMENT**	*Reinforcement*: function, materials, methods of fixing, minimum cover and position of reinforcement in columns and beams
1 week (4 hours)	**CONSTRUCTION:** **PLASTER** **BRICKWORK**	*Plaster*: Mixing proportion, application and preparation of wall for plaster *Brickwork*: The use and drawings of the alternate plan courses of one brick wide T-junctions and corners built in English bond
1 week (4 hours)	**CONSTRUCTION:** **CAVITY WALLS**	The purpose, advantages, disadvantages and constructional details of cavity walls
1 week (4 hours)	**CONSTRUCTION:** **LINTELS** **WATER-PROOFING**	*Lintels*: Purpose, use, types, sizes of pre-stressed lintels. *Waterproofing*: Position and method of installing DPC in the following areas in a building: windows, doors and walls
1 week (4 hours)	**CONSTRUCTION:** **FORMWORK** **SHORING**	*Formwork*: materials used and identification of different parts of formwork used for columns, stairs and arches Methods of erecting formwork The type of props and scaffolding and their uses *Shoring*: Purpose and reasons for using raking and flying shores Constructional details
1 week (4 hours)	**CONSTRUCTION:** **WOODWORKING**	Location, sizes, purpose, method of installing and sketching section of profiles of wooden building components, e.g. skirting, quadrant, cornices and architraves Layout, construction, method of finishing for a ceiling for one room
3 weeks (12 hours)	**CONSOLIDATION, MID-YEAR EXAMINATION AND COMPLETION OF SECOND PHASE OF PAT**	

GRADE 11 - TERM 3

Week	Topic	Content
1 week (4 hours)	**CONSTRUCTION:** **WOODWORKING**	Drawings of elevation, horizontal and vertical sections of a four-panel entrance door and hollow-core flush-panel internal doors. Purpose, need, materials and methods of application of preservatives for timber
2 weeks (8 hours)	**CONSTRUCTION FINISHING:** **PLASTERING** **TILING**	Preparation of walls and application of plaster Planning, preparation, installation procedure and finishing of floor and wall tiles
1 week (4 hours)	**CONSTRUCTION FINISHING: PAINTING**	Preparation of surfaces and various methods of application of paints for interior and exterior purposes
2 weeks (8 hours)	**CIVIL SERVICES: WATER SUPPLY** **HOT WATER SYSTEMS**	*Basic plumbing in a house to include*: Fitments, distribution and placement of pipes (surface and chased) Types of pipe materials used for hot and cold water supply *Introduction to hot water systems*: electric pressure geysers and gravity geysers
2 weeks (8 hours)	**CIVIL SERVICES:** **SEWERAGE**	Line diagram of the layout of a sewerage plan for a simple single-storey dwelling, up to the connection point of the local authority (taking into account abbreviations, gradient, regulations and sewerage principles). Calculation of invert levels
1 week (4 hours)	**CIVIL SERVICES:** **STORM-WATER**	*Storm-water*: The regulations and methods of disposing of large quantities of water from a site to the municipal storm-water system
1 week (4 hours)	**CONSOLIDATION AND COMPLETION OF THE PAT**	

GRADE 11 - TERM 4

Week	Topic	Content
1 week (4 hours)	**CIVIL SERVICES: ELECTRICAL SYSTEM**	Electrical system: Installation and location of distribution box, card supply (prepaid) box and conduits
2 weeks (8 hours)	**QUANTITIES**	Method of extracting quantities of materials for the sub-structure and super structure of a dwelling by applying basic mathematical formulae Cutting list for doors and ceiling
2 weeks (8 hours)	**JOINING: BRICKWORK**	Materials and methods used to join brickwork to timber, steel and aluminium frames
1 week (4 hours)	**JOINING: WOOD**	*Sketches and uses of the following joints*: mortise and tenon joint and long and short shoulder mortise and tenon joint (rebate joint).
1 week (4 hours)	**JOINING: PLUMBING PIPES**	Joining methods of capillary joint and compression joints, PVC water pipes
3 weeks (12 hours)	**FINAL EXAMINATIONS AND ASSESSMENT OF PAT**	

GRADE 12 - TERM 1

Four hours of contact time is prescribed per week. Two and a half hours is intended for theory and one and a half hours for practical work and completion of the PAT. (**One double period per week is required for practical work)**

Week	Topic	Content
1 week (4 hours)	**SAFETY AND PAT** **MATERIALS**	Application and regulations of the OHSA pertaining to clothing, head protection, eye and ear protection, footwear Application and regulations of the OHSA pertaining to hand tools, power tools, construction machinery, workplace and safe site working methods Safe site planning and organisation pertaining to excavations, handling of materials, floors and stairs with open sides, builders' hoist and ladders **Sustainability of materials according to their appropriate use and nature** Profiles, properties and uses of I-beam, H-beam, channel and angle iron. Preservation, painting and curing of wood, metal, concrete, walls and plastic PAT handout to learners
1 week (4 hours)	**GRAPHICS/** **COMMUNICATION**	**Instrument drawings involving orthographic projection with sections** Different elevations of a building Vertical sections with labels and dimensions to SANS specification for building drawings
2 weeks (8 hours)	**GRAPHICS/** **COMMUNICATION**	Drawing of house plans for dwellings with gable roof, hipped roof with valleys, lean-to roof, flat roof and roofs with parapet walls, including floor plan, drainage plan, site plan, elevations and the ability to develop drawings from specifications and descriptive notes CAD and electronic media
1 week (4 hours)	**EQUIPMENT** **HAND TOOLS** **POWER TOOLS**	Use, care and setting up of the dumpy level to determine datum point, slopes and distances Hand and power tools used in the construction processes of roof trusses: *Hand tools*: steel tape measure, building line, chalk line, plumb bob steel square (builders), spirit level and transparent pipe level *Woodwork tools*: try and mitre squares, sliding bevel, rip saw, cross-cut saw, cross-peen -and claw hammer *Power tools*: portable electric circular saw, portable generator, angle grinder and portable electric plane. *Construction machinery*: generator (electricity supply) and electric mitre saw
2 weeks (8 hours)	**APPLIED MECHANICS**	**Graphical determination of the nature and magnitude for the different members in force diagrams of roof frames and structures including cantilever frames (only vertical loads)** *Beams***:** Reactions at the supports **Calculation of reactions at the supports (max THREE point loads and ONE UDL, NO OVERHANGS OR CANTILEVERS)** Calculations and diagrams of shear force and bending moments Use of the correct units and terminology Calculation of centroids of irregular shapes consisting of a combination of squares, rectangles or triangles only (Supply formulae sheet to learners.)

Week	Topic	Content
2 weeks (8 hours)	**CONSTRUCTION: PILING** **CONCRETE** **RIB AND BLOCK FLOOR**	*Piling*: sketches, purpose, types, positioning, how, when and where used *Ready-mixed concrete*: mix proportions of concrete (low, medium and high strength) Components of concrete Difference between mass and reinforced concrete Transport, placing, levelling, compacting and curing Setting times and admixtures *Tests on concrete and the purpose of each*: slump and cube test Sketches, advantages, installation method, precaution before and after installation of rib and block/block and beam construction (or similar technique) for multi-storey floor slabs and roofs
1 week (4 hours)	**COMPLETION OF FIRST PHASE OF PRACTICAL ASSESSMENT TASK (PAT)**	

GRADE 12 - TERM 2

Week	Topic	Content
1 week (4 hours)	**CONSTRUCTION: REINFORCING**	*Show reinforcing in concrete for*: floors, beams, cantilever beams and columns, sectional views only Minimum concrete cover Materials and compliance requirements for materials used for reinforcing
1 week (4 hours)	**CONSTRUCTION: FORMWORK**	Materials used and identification of different parts of formwork used for columns, stairs, beams, floors and arches Methods of erecting formwork Types of props and scaffolding, their uses and regulation during use and erection *Formwork*: form oils and emulsions, and defects that can occur in concrete due to shuttering
1 week (4 hours)	**CONSTRUCTION: DRYWALL CONSTRUCTION**	Materials, advantages, disadvantages, methods of finish and installation methods of dry wall construction for dry and wet conditions
1 week (4 hours)	**CONSTRUCTION: BRICKWORK**	Alternate plan courses of T-junctions and corners built in Stretcher bond and English bond Constructional details, purpose, advantages and disadvantages of beam filling Sketches, constructional details, purpose, advantages and disadvantages of cavity walls Purpose, constructional details, advantages, disadvantages and support during construction of semi-circular and flat arches closed and open laging. Differentiation between rough arches and gauged arches
1 week (4 hours)	**CONSTRUCTION: WOODWORKING**	Position, sizes and purpose of cover strips, brandering, ceilings, cornice, skirtings and roof timbers. Layout, installation, different types of ceiling materials and finishing to ceilings Sketch of double casement without fanlight.

Week	Topic	Content
1 week (4 hours)	**CONSTRUCTION:** **WOODWORKING**	*Roof trusses*: couple roof, King post truss, SA or Howe truss, W truss, lean-to truss and lean-to frame with open and closed eaves and sectional views *Layout of trusses*: gable roof, hipped roof with valleys and lean-to roof, including roofs with parapet walls
1 week (4 hours)	**CONSTRUCTION:** **ROOF COVERING** **WATER-PROOFING**	Regulations, purpose, methods of installation, spacing of roof trusses and spacing of purlins/battens for particular types of roof coverings Properties, composition, method of fixing, advantages and disadvantages of concrete roof tiles, thatch, IBR, and corrugated iron sheeting Waterproofing of roof (parapet walls) Positioning, properties and types of materials used for damp course in basements, walls, floors and roofs
3 weeks (12 hours)	**CONSOLIDATION, MID-YEAR EXAMINATION AND COMPLETION OF SECOND PHASE OF PAT**	

GRADE 12 - TERM 3

Week	Topic	Content
1 week (4 hours)	**CONSTRUCTION:** **FINISHING**	*Plastering*: different finishes (rough cast and smooth plastered) *Tiling*: floors and walls *Painting*: interior, exterior and different applications Covering of plumbing, electrical and drainage pipes by chasing into wall or floor and covering with plaster, tiles or other appropriate material Modern methods of finishing walls, roofs and floors
1 week (4 hours)	**CIVIL SERVICES:** **COLD WATER SUPPLY**	*Water supply*: where used**,** advantages and disadvantages and working principles of other water supplies such as boreholes and shallow wells *Basic plumbing in a house including*: fittings, distribution and placement of pipes (surface or chased) *Types, advantages, disadvantages and properties of pipes*: used for hot and cold water supply
1 week (4 hours)	**CIVIL SERVICES:** **HOT WATER SUPPLY**	Working principles of geysers Types, installation, advantages, disadvantages and working principles of solar geysers and other water heaters (gas and online) Purpose of pressure-reducing valves

Week	Topic	Content
2 weeks (8 hours)	**CIVIL SERVICES:** **SEWERAGE**	Differentiation between sewage and sewerage, differentiation between soil water and waste water, ventilation system, soil vent pipes, water traps and gulley, regulations governing drainage, abbreviations used in drainage systems Properties, advantages and disadvantages of materials used in a sewerage system: PVC pipes and fittings and cast iron pipes Line diagram of the layout of a sewerage plan for a simple single-storey dwelling, up to the connection point of the local authority, taking into account abbreviations, gradient, regulations and sewerage principles Calculation of invert levels at the top and bottom of drains, taking into consideration regulations, colour coding and sectional view (identification of different components) Reasons for installing, advantages, disadvantages, regulations, purpose and functioning of conservancy tank, septic tank and French drains
1 week (4 hours)	**CIVIL SERVICES:** **STORM-WATER** **ELECTRICAL SYSTEM**	The regulations and methods of disposing of large quantities of water from a site to the municipal storm-water system. Methods of chanelling storm-water from municipal manholes to run-offs, catchments, dams and rivers Identification and interpretation of basic electrical symbols, which are to be used in the drawing of a basic electrical layout for a building Installation and location of meter box, distribution box, card supply (prepaid) and conduits
1 week (4 hours)	**JOINING:** **BRICKWORK** **WOOD** **PLUMBING/ PIPES**	Joining roof trusses to brickwork Bolts, screws, nails, gang nails, roof wire, hoop iron (galvanised strap) Joining of pipes for cold water supply from municipal supply to sanitary fixtures and geysers Material used and joining methods for capillary joint and compression joints Materials used and joining methods for thread joints, PVC adhesives
3 weeks (12 hours)	**TRIAL EXAMINATIONS AND COMPLETION OF THE PAT**	

GRADE 12 - TERM 4

Week	Topic	Content
2 weeks (8 hours)	**QUANTITIES**	Calculating quantities of materials for a one-bedroom dwelling applying basic mathematical formulae Cutting list for doors, ceilings and windows
2 weeks (8 hours)	**CONSOLIDATION**	
	END-OF-YEAR EXAMINATIONS	

SECTION 4

ANNUAL ASSESSMENT REQUIREMENTS

4.1 Introduction

Assessment is a continuous, planned process of identifying, gathering and interpreting information about the performance of learners, using various forms of assessment. It involves four steps: generating and collecting evidence of achievement, evaluating this evidence, recording the findings and using this information to understand and assist the learner's development in order to improve the process of learning and teaching.

Assessment involves activities that are undertaken throughout the year. In Grades 10 to 12 assessment should be both informal (assessment for learning) and formal (assessment of learning). In both cases regular feedback should be provided to learners to enhance the learning experience.

Evidence of all assessments including tests, simulations and tasks should be placed in the learner's script. It is imperative that all items be marked clearly. Items that are loose should be pasted into the script to form a permanent part thereof.

All items in the learner script must contain the following references:

- Date;
- Topic;
- Homework assignments must show a text book page and exercise reference;
- Learner scripts are required to show scrutiny and interaction from the teacher in red pen;
- All teacher actions/interventions in the script must be dated; and
- Learners are required to mark all self-assessments in pencil and all corrections must be shown in pencil.

As the script is a formal assessment document, the learner is required to cover and keep the script neat and clean. The teacher is required to provide guidance in this respect.

Apart from the learner script, no additional file or portfolio is required.

4.2 Informal or Daily Assessment (Assessment for Learning)

Assessment for learning has the purpose of continuously collecting information on learners' achievement that can be used to improve their learning.

Informal assessment is a daily monitoring of learners' progress. This is done through observations, discussions, practical demonstrations, learner-teacher conferences, informal classroom interactions, etc. Informal assessment may be as simple as stopping during the lesson to observe learners or to discuss with learners how learning is progressing. Informal assessment should be used to provide feedback to the learners and to inform planning for teaching, but need not be recorded. It should not be seen as separate from learning activities taking place in the classroom. Learners or teachers can mark these assessment tasks.

Self-assessment and **peer assessment** actively involve learners in assessment. This is important, as it allows learners to learn from and reflect on their own performance. The results of the informal daily assessment tasks are not formally recorded unless the teacher wishes to do so. In such instances, a simple checklist may be used to record this assessment. However, teachers may use the learners' performance in these assessment tasks to provide verbal or written feedback to learners, the school management team and parents. This is particularly important if barriers to learners or poor levels of participation are encountered. The results of daily assessment tasks **are not taken** into account for promotion and certification purposes.

Informal assessment tasks do not contribute to the promotion and progression of the learner. Its sole intention is the development of knowledge and skills in preparation for formal assessment.

ASSESSMENT TASKS	TERM 1	TERM 2	TERM 3	TERM 4
Tests (class, theory and revision tests)	1	1	1	Consolidation
Assignment	1	1	1	0
Class work/case studies/work sheets	Weekly	Weekly	Weekly	0
Homework (theory and practical)	Weekly	Weekly	Weekly	Consolidation
Workshop/practical	Weekly	Weekly	Weekly	0

Evidence of informal assessment will be found in the learner's script. The nature of these tasks is described under assessment for learning.

4.3 Formal Assessment (Assessment of Learning)

4.3.1 Formal assessment requirements

All assessment tasks that make up a formal programme of assessment for the year are regarded as formal assessment. Formal assessment tasks are marked and formally recorded by the teacher for progression and certification purposes. All formal assessment tasks are subject to moderation for the purpose of quality assurance and to ensure that proper standards are maintained.

Formal assessment provides teachers with a systematic way of evaluating how well learners are progressing in a grade and in a particular subject. Examples of formal assessments include projects, oral presentations, demonstrations, performances, tests, examinations, practical tasks, etc. Formal assessment tasks form part of a year-long formal programme of assessment in each grade and subject.

PROGRAMME OF ASSESSMENT		
School-based Assessment (SBA)	PAT	November examination
25%	25%	50%

The formal assessment requirements for Civil Technology are as follows:

- School-based assessment shows the learner's progress throughout the year and accounts for 25% of the learner's promotion mark. These assessments comprise the SBA tasks, which are written at the end of terms 1, 2 and 3.
- The PAT accounts for the skills the learner has mastered. This is assessed at intervals and requires the learner to engage in multiple practical sessions. During these weekly sessions, skills such as simulation, experimentation, hand skills, tool skills, machine skills and workshop practice are honed and perfected to the

point where the learner may engage in the tasks set out for that particular term. The PAT accounts for 25% of the learner's promotion mark.

- At the end of each academic year every learner is required to write a final examination, which is compiled in such a way that it represents the entire theoretical content covered throughout the year. The final examination will test the learner's knowledge and skills acquired throughout the year in Civil Technology. The November question paper accounts for 50% of the learner's promotion mark.
- In Grades 10 and 11 all SBA are set and moderated internally.
- In Grades 10 and 11, however, the PAT is set internally but moderated externally.
- In Grade 12 the formal assessment (25%) is internally set and marked but externally moderated. The end of the year written assessment (50%) is externally set, marked and moderated and the PAT (25%) is externally set, internally marked and externally moderated.

Formal assessments must cater for a range of cognitive levels and abilities of learners as shown below:

Cognitive Levels	Percentage of Task
Lower order: Knowledge	30
Middle order: Comprehension and application	50
Higher order: Analysis, evaluation and synthesis	20

4.4 Projects

Learners will only do one project per subject per annum. In Civil Technology the PAT will serve as the project for the learners in Grades 10-12 (refer to term plans). The PAT for grade 12 is set by the Department of Basic Education and the PATs for Grades 10 - 11 are set internally by the teacher.

A project should require the learner to:

- do some planning/preparation/investigation/research to solve the identified problem/task;
- perform the task/carry out instructions (according to criteria given);
- develop the project according to the given criteria; and
- apply some innovation and creativity.

To set the project, the teacher should:

- determine the content/skills/knowledge to be addressed;
- set clear criteria and give good instructions to guide the learner (the learner should know exactly what to do and what is expected);
- keep the scope manageable;
- determine which resources will be required to complete the project. Ensure that learners will have access to these resources;

- determine the time frame/duration/due date; and
- determine the distribution of marks and compile an assessment tool.

4.5 Programme of Assessment

4.5.1 Timing of tests and tasks

The programme of assessment is designed to spread formal assessment tasks in all subjects in a school throughout a term. Without this programme, tests and tasks are crowded into the last few weeks of the term, creating unfair pressure on the learners.

The following is the programme of assessment for Grade 10 and 11:

GRADE 10 and 11 ASSESSMENT REQUIREMENTS							
ASSESSMENT TASKS	**TERM 1**	**TERM 2**	**TERM 3**	**TERM 4**	**% OF FINAL PROMOTION MARK**		**MARK WEIGHTING**
Tests	1		1		10	25 in total	250 total converted to mark out of **100**
Mid-year examination		1			15		
PAT	☑	☑	☑		25		250 total converted to mark out of **100**
End-of-year assessment				1	50		**200**
TOTAL - PROMOTION MARK							**400**

The table below shows the compilation of the SBA mark.

Description	**Time frame**	**Weighting of final mark**	**Mark allocation**
Control test 1	**Term 1** January - April	5%	50
Mid-year examinations	**Term 2** May - June	15%	150
Control test 2	**Term 3** July - October	5%	50
Total		25%	250

The following is the programme of assessment for Grade 12:

GRADE 12 ASSESSMENT REQUIREMENTS							
ASSESSMENT TASKS	**TERM 1**	**TERM 2**	**TERM 3**	**TERM 4**	**% OF FINAL PROMOTION MARK**		**MARK WEIGHTING**
Tests	1				5	25 in total	450 total converted to mark out of **100**
Mid-year and trial examination		1	1		20		
PAT	☑	☑	☑		25		250 total converted to mark out of **100**
End-of-year assessment				1	50		**200**
TOTAL - PROMOTION MARK							**400**

The table below shows the compilation of the SBA mark.

Description	Time Frame	Weighting of final 25%	Marks
Control test	Term 1	5%	50
May examination	Term 2	10%	200
Preparatory examination	Term 3	10%	200
Total		**25%**	**450**

Tests

- A test for formal assessment should not comprise a series of small tests, but should cover a substantial amount of content and the duration should be at least 60 minutes.
- Each test and examination must cater for a range of cognitive levels.
- The forms of assessment used should be age and developmental level appropriate. The design of these tasks should cover the content of the subject and include a variety of tasks designed to achieve the objectives of the subject.

4.5.2 Examinations

- For Grades 10, 11 and 12, the three-hours end-of-year examination in Civil Technology (200 marks) comprises 50% of a learner's total mark.
- All question papers set by the teacher throughout the year, including the November paper, must be moderated by the head of department (HOD) at the school and approved by the Civil Technology facilitator at the district. This is done to ensure that the teacher adheres to the prescribed weightings.
- In the Grade 12 examination **only Grade 12 content** will be assessed. However, prior knowledge from Grades 10 and 11 may be necessary to interpret and answer some of the questions.

The mark allocation for examination papers in all grades is indicated below.

Question	Content covered	Marks
1	Construction, safety and material	30
2	Advanced construction and equipment	40
3	Civil services	30
4	Quantities, materials and joining	30
5	Applied mechanics	30
6	Graphics and communication	40
TOTAL		**200**

4.6 Recording

Recording is a process in which the teacher documents the level of a learner's performance in a specific assessment task. It indicates learner progress towards the achievement of the knowledge as prescribed in the Curriculum and Assessment Policy Statements. Records of learner performance should provide evidence of learners' conceptual progression within a grade and their readiness to progress or be promoted to the next grade. Records of learner performance should also be used to verify the progress made by teachers and learners in the teaching and learning process.

According to the above, teachers will record actual marks against the tasks by using a record sheet and also report in percentages against the subject on the learner's report cards.

4.7 Reporting

Reporting is a process of communicating learner performance to learners, parents, schools, and other stakeholders. Learner performance can be reported in a number of ways. These include report cards, parents' meetings, school visitation days, parent-teacher conferences, phone calls, letters, class or school newsletters, etc. Teachers in all grades report in percentages against the subject. The following rating scale will apply for reports:

CODES AND PERCENTAGES FOR RECORDING AND REPORTING

Rating code	Description of competence	Percentage
7	Outstanding achievement	80 - 100
6	Meritorious achievement	70 - 79
5	Substantial achievement	60 - 69
4	Adequate achievement	50 - 59
3	Moderate achievement	40 - 49
2	Elementary achievement	30 - 39
1	No achievement	0 - 29

Note: The seven-point scale should have clear descriptors that give detailed information for each level.

4.8 Moderation of Assessment

Moderation refers to the process that ensures that the assessment tasks are fair, valid and reliable. Moderation should be implemented at school, district, provincial and national levels. Comprehensive and appropriate moderation practices must be in place for the quality assurance of all subject assessments.

4.8.1 PAT moderation

Moderation of the PAT can start as early as the end of the first term i.e. Design portfolios and drawings. The project, however, will only be moderated upon completion.

The moderation process is as follows:

- During moderation learners are selected at random to demonstrate the different PAT skills/simulations.
- Learners being moderated will have access to their completed project during moderation and may refer to the tasks they completed earlier in the year.
- Learners may not ask assistance from other learners during moderation.
- All projects must be on display for the moderator.
- Where required, the moderator should be able to call on the learner to come and explain the function and principles of operation and also request the learner to exhibit the skills acquired through the skills for moderation purposes (face moderation).
- Upon completion the moderator will, if needed, adjust the marks of the group upwards or downwards, depending on the decision reached as a result of moderation.
- Normal examination protocols for appeals will be adhered to if a dispute arises from adjustments made.

4.8.2 SBA moderation

Moderation of written tests and examinations shall be conducted by the subject facilitator or a peer teacher. Grade 10 and 11 tasks are internally moderated, except the PAT, which is externally moderated. The subject advisor must moderate a sample of these tasks during her school visits, to verify the standard of the internal moderation. Moderation of written tests constitutes re-marking of the learners' work to ensure assessment by the teacher is correct.

Grade 12 tasks must be moderated by the provincial subject advisor. This process will be managed by the provincial education department.

School-based moderation by the HOD requires the HOD to check the following:

- Learner compliance
  - Work done by learners comply with the following requirements:
    - Date
    - Topic
    - Homework assignments must show a text book page and exercise reference.
    - Learner scripts are required to show scrutiny and interaction from the teacher in red pen.
    - All teacher actions/interventions in the script must be dated.
    - Learners are required to mark all self-assessments in pencil and all corrections must be shown in pencil.
  - Safety
    - Learners are required to dress appropriately when entering the workshop.
    - Personal safety should be adhered to.
    - Learner conduct in the workshop must be orderly and appropriate.
    - Learners are required to enact safety drills, practise safe operating procedures, perform housekeeping tasks and assist in workshop preventative maintenance such as cleaning, painting, sanding, etc.
  - Practical assessment tasks/session in the workshop.
    - Learners are required to engage actively in PATs, assignments, simulations and experiments.
    - Learners who are un-cooperative will receive de-merits or a zero mark allocation for that particular section of work.
    - Learners who act unsafely in a workshop and/or place other learners in danger will be removed from the workshop and will have to perform additional tasks or engage in corrective behaviour tasks to show improvement in safety awareness and skill. This will be done outside of normal contact time.
- Teacher compliance
  - Preparation done by the teacher includes:
    - keeping to pace setters and work schedule;
    - planning of work schedule dates and indicating achievement of dates;
    - lesson preparation for each topic; and

- o aligning lesson preparations and dates in learners' books.
- Worksheets/tasks/homework assignments in lesson preparation align with learner books.
- Work is being done every day in the learner books.
- Work in books is regularly checked and dated by the teacher.
- Memorandums are compiled before tests are written.
- Examinations and major tests are moderated by a peer teacher/facilitator from the district.

• Workshop management

- Storeroom is indexed, neat and clean.
- Inventory is kept up to date every six months
- Workshop is clean and neat.
- Preventative maintenance schedule is drawn up.
- Workshop budget is prepared and ready.
- Procurement schedule for PAT and consumable items is kept up to date.
- Replacement of old equipment is planned and implemented.
- Maintenance of tools and equipment

• Classroom management

- Classroom is neat and clean.
- Posters and exhibits are evident.
- Pin boards are neatly populated.
- Teacher workstation/desk is neat and clean.
- Filing is neat and tidy

4.9 Practical Assessment Task

In all grades each learner must do a PAT for the year:

• *Grade 10 and 11*: Teachers will set and assess the PAT and it will be moderated externally by the subject specialists.

• *Grade 12:* The practical assessment tasks in Grade 12 will be assessed by the teacher and will be externally moderated by the provincial subject specialists.

Practical sessions should therefore be scheduled in such a way that learners have enough time to practise skills needed for the completion of the PAT. Weekly practice sessions are needed for the learner to hone the needed skills. A guideline of one and a half hours per week is given in Grade 10, 11 and 12.

- The PAT comprises 25% (100) of the promotion mark
- The PAT will be presented for evaluation in the format of:
  - a design portfolio 25%;
  - working drawings 25%; and
  - an artifact comprising 50%.
- The design brief must be presented for evaluation at the end of the first term.
- The working drawing must be presented at the end of the second term for evaluation.
- The artifact must be presented at the end of the third term or very early in the fourth term for evaluation.
- The PATs for Grade 10 and 11 are set internally, in line with guidelines provided by the Department of Basic Education.
- Instructions for the Grade 12 PATs will be set externally and sent to schools at the end of the previous year. Learners may choose an option of scenarios if choices are given.
- The date for the external moderation will be decided by the province in which the school is situated.
- The provincial education departments or schools may not change or use the PAT of the previous year for Grade 12.
- Providing the resources for the PAT is the responsibility of the school and schools must ensure that adequate time is allocated for the completion of the PAT.

4.10 Progression and Promotion

A learner needs to achieve at least 30% (120) of the final mark to pass Civil Technology.

4.11 General

This document should be read in conjunction with:

4.11.1 *National policy pertaining to the programme and promotion requirements of the National Curriculum Statement Grades R-12*; and

4.11.2 The policy document, *National Protocol for Assessment Grades R-12.*