

AGRICULTURAL SCIENCES

This document must be read in conjunction with the IEB Manual for the Moderation of School-based Assessment (Updated September 2015)

A. MEANS OF ASSESSMENT

Paper I: Theory	3 hours	[300]
School-based Assessment (SBA)		[100]

400 marks

B. REQUIREMENTS

1. EXAMINATIONS

Question Paper I:	Agricultural Sciences		
Title or description	Theory Paper I		
Time:	3 hours	Total Marks:	300
Areas of focus:	Questions are set on all topics		
Structure of the paper:	The paper comprises the following: Section A consists of objective type questions – 80 marks. Section B consists of 4 structured questions – 50 marks for each question. Section C requires an extended writing response All questions are compulsory.		

Weighting of cognitive levels:	60%			40%		
	30%	20%	10%	10%	15%	15%
	Knowledge	Comprehension	Application	Analysis	Synthesis	Evaluation

2. School-based Assessment (SBA)

SBA Item	Weighting
Preliminary Examination/Trial paper	25
Controlled test #1	15
Controlled test #2	15
Controlled writing piece (essay)	15
Oral Task	15
Visual Task	15
TOTAL	100

C. INTERPRETATION OF REQUIREMENTS

1. EXAMINATION

The Assessment Syllabus

The purpose of this Assessment Syllabus is to assist IEB teachers in reaching a common understanding of the scope of the topics and therefore support schools in planning their teaching, learning and assessment programmes consistently, as well as to make the IEB examination and SBA requirements at grade 12 explicit for teachers, assessors and moderators.

The document is not meant to be a teaching syllabus. Individual teachers and schools are not restricted to the contents of the Assessment Syllabus; they are free to expand on these in their own curriculum delivery. The teaching and learning programme should be rich, stimulating and challenging, while assessment is focused on the assessment requirements of the subject, in its contribution to the qualification.

The Grade 10 and 11 assessment syllabi are included for information and guidance, but only the Grade 12 assessment syllabus is mandatory. However Agricultural Sciences is a THREE year course and therefore learners should have an understanding of all terminology and concepts from previous grades where this forms the basis of work in the next grade(s).

The Assessment Syllabus follows the SBA requirements.

2. SCHOOL-BASED ASSESSMENT

2.1 Preliminary Examination/Trial Paper (25 marks out of 100)

This component must come from the last major Summative Assessment to have taken place before the Final NSC Examination period. The examination should mimic the external examination in its design, rigour and format. Whilst all of the content may not have been covered by the date of the Preliminary Examination, the paper must be set to the time and rigour of the Final Examination.

2.2 Controlled Tests (two tests: each to count 15 out of 100)

Controlled tests are written by the entire grade (preferably at the same time). These should count at least 50 marks each and must assess deeply within one Topic or across Topics. 60% of the marks should relate to lower order thinking skills (knowledge, comprehension and application) and 40% to higher order thinking skills (analysis, synthesis and evaluation).

2.3 Tasks

The three tasks must be set on different topics.

2.3.1 Controlled Writing Piece (15 marks out of 100)

This SBA item is designed to test higher order thinking skills of analysis, synthesis and evaluation of knowledge in a timed pen and paper exercise. It is important to give the candidates enough time to thoroughly plan and execute this activity. One hour is recommended as the ideal amount of time required to plan and write a 400 to 600 word essay. The content area/theme of the essay (**not the question**) must be provided to the candidates as an information sheet before this activity to allow them to do some initial reading and planning. The actual question for the essay must only be provided as an instruction sheet on the day as candidates enter the venue to write. Candidates must be allowed to bring resources such as textbooks and notes into the session with them to allow them the opportunity to check facts for accuracy. It is important to note that it is not the content of the essay that is of prime importance in this activity but rather how the candidate has used the content to motivate their response. Learners can be asked to, for example, provide their opinion on a controversial issue and substantiate it, critique a particular process or provide a strategy for dealing with an issue.

The theme/content area given to the candidates must relate to the Grade 12 Assessment Syllabus. This activity provides an opportunity for the candidates to connect new knowledge to their existing knowledge. This SBA piece must be assessed against a Marking Rubric.

2.3.2 Oral Presentation

This individual task involves the gathering, processing and verbal presentation of information around a current topic. The presentation should have an introduction, body and conclusion. Visual aids such as Power Point®, a poster or a chart may be used to support the presentation. The content should count at least 80% of the mark. This means that the presentation should not count for more than 20% of the overall mark. Hard copy evidence of the presentation, for example photographs, cue cards or PowerPoint® slides, must be included in the Learner's File.

2.3.3 Visual Task

This task should be a product that communicates information visually, for example a brochure, booklet or poster. The product should be based on agricultural issues. The assessment of the content should supersede attractiveness. The content should count at least 80% of the mark. This means that the presentation should not count for more than 20% of the overall mark. Hard copy evidence of the task, for example photographs of the brochure, booklet or poster must be included in the Learner's File

Moderation at School Level

It is expected that moderation of the assessment process has taken place at school level to ensure that assessment is valid, fair and reliable. This includes moderation of assessments before they are done by learners, moderation of the marking of the learner evidence by the teacher/assessor and checking of the calculations of learners' results. Evidence of this having taken place must be included in both the Teacher's and Learner's Files.

AGRICULTURAL SCIENCES: ASSESSMENT SYLLABUS

GRADE 10

Topic	Subtopic	Content	Examples (including but not limited to)
Soil Science	Basic soil components	<p><i>The concept: soil</i></p> <ul style="list-style-type: none"> • The main functions/importance of soil in an ecosystem • <i>The following major components of soil:</i> <ul style="list-style-type: none"> - Organic matter, Soil air, Soil water and Mineral particles 	
	Rocks and their formation	<p><i>The concept: rocks/mother rock</i></p> <ul style="list-style-type: none"> • The main types of rocks based on: <ul style="list-style-type: none"> - Their origin (formation) that are important in soil formation processes <ul style="list-style-type: none"> ▪ Igneous rocks, Sedimentary rocks and Metamorphic rocks • The cultivation properties/suitability of soil that originate from different types of rocks 	Igneous rocks: Granite, Basalt Sedimentary rocks: Sand stone, Shale Metamorphic rocks: Marble, Slate
	Weathering of rock	<p><i>The concept: weathering of rocks</i></p> <ul style="list-style-type: none"> • The importance of the weathering of rocks • The weathering factors important in soil formation: <ul style="list-style-type: none"> - Physical/mechanical, Chemical weathering and Biological weathering 	
	Minerals (primary and secondary)	<p><i>The concept: minerals</i></p> <ul style="list-style-type: none"> • The main differences between primary and secondary minerals <ul style="list-style-type: none"> - Primary minerals and Secondary minerals • The main characteristics used in mineral identification 	Primary minerals: Quartz, Feldspars Secondary minerals: Clays, Oxides
	Soil formation	<p><i>The concept: soil formation</i></p> <ul style="list-style-type: none"> • The description of the following main soil forming factors: <ul style="list-style-type: none"> - Geographical/topographical factors, Climatic factors, Organisms/biological factors, Parent material and Time • Soil forming processes that are active in soils: <ul style="list-style-type: none"> - Mineralization, Humification, Leaching, Luviation, Plinthite formation, Inversion and Bioturbation 	Geographical/Topographical factors: Altitude, Slope, Aspect Climatic factors: Temperature, Rainfall, Wind Organisms/biological factors: Plants/vegetation, Mesofauna, Animals, Human activities Parent materials: Geology, Mineralogy

Topic	Subtopic	Content	Examples (including but not limited to)
Sustainable Natural Resource Utilization	Natural and agricultural resources	<p><i>The concepts: natural resources and agricultural resources</i></p> <ul style="list-style-type: none"> • The different types of agricultural resources and their importance in Agriculture with relevant examples • The pressure exerted on the natural resources by the growing population to meet the demand for food • The sustainable utilization of natural resources in Agriculture 	
	Grazing ecology	<p><i>The concepts: grazing ecology</i></p> <ul style="list-style-type: none"> • Natural and artificial pastures • Grazing ecology <ul style="list-style-type: none"> - Ecological succession in grassland and adaptations to grazing by game animals before agriculture - Selective and non-selective grazing - Zero grazing • Optimal grazing <ul style="list-style-type: none"> - Carrying capacity/grazing capacity and Stocking rate • Veld types of Southern Africa: <ul style="list-style-type: none"> - Sweetveld, Sourveld and Mixed-veld • Characteristics of grazing plants <ul style="list-style-type: none"> - Grazing value in terms of palatability - Nutritive value and resistance to grazing - Ecological status • Scientific approach to pasture evaluation and monitoring <ul style="list-style-type: none"> - Methods used to determine the condition of pastures 	
	Pasture or veld management	<p><i>The concepts: pasture or veld management</i></p> <ul style="list-style-type: none"> • Importance of pastures for the livestock industry in South Africa • Relationship between pasture management and pasture condition • Veld management practices: <ul style="list-style-type: none"> - Stocking rate, Animal ratio and Grazing systems • Veld management systems <ul style="list-style-type: none"> - Use of camps/farming units • Advantages and disadvantages of the various grazing systems • The pasture veld management practices which lead to poor pasture conditions 	Grazing systems: Slow rotational, Continuous, Game and communal farming, Veld burning

Topic	Subtopic	Content	Examples (including but not limited to)
Plant Science	Importance and economic value of plants in agriculture	<ul style="list-style-type: none"> • The average volumes of production of economically important crops/plants: <ul style="list-style-type: none"> - The main production areas of crops in South Africa - The general economic importance and utilization of crops • Criteria for successful crop production 	Alphabetical list of plant examples: <ul style="list-style-type: none"> - Apples; Apricots; Artichokes; Asparagus; Avocado - Banana; Beetroot; Bell Peppers; Broccoli - Cabbage; Carrot; Cashew; Cauliflower; Celery; Cherry; Cinnamon; Coconut; Cotton - Egg Plant - Gooseberry; Granadilla; Grape; Grapefruit; Guava; Gum - Kikuyu - Lavender; Lemon; Lettuce; Litchi - Macadamia; Mahogany; Maize; Mango; Melon; Mustard - Oats; Olives; Orange - Parsley; Peach; Peanut; Pear; Pecan; Pepper; Pine; Pineapple; Pumpkin - Radish; Raspberry; Rye - Sisal; Soya beans; Spinach; Strawberry; Sugar Cane; Sweet potato - Tea (Camellia); Thyme - Wattle; Wheat
	Classification by human use	<ul style="list-style-type: none"> • Edibles <ul style="list-style-type: none"> - Fruits <ul style="list-style-type: none"> ▪ Tree fruits (Citrus, Pome, Stone or other), Small fruits (Berries) or other - Vegetables <ul style="list-style-type: none"> ▪ Growth season (warm or cool season) or the part of the plant consumed (root, bark, stem, leaf, flower, fruit, or seed) - Herbs <ul style="list-style-type: none"> ▪ Culinary or Medicinal - Nuts <ul style="list-style-type: none"> ▪ Tree or ground nuts • Fuel • Fibre • Building/construction • Ornamental/Landscape plants <ul style="list-style-type: none"> - Woody plants, herbaceous plants or grass/turf • Potted plants, house plants, gift plants <ul style="list-style-type: none"> - Flowering gift plants or foliage plants 	
	Classification by climatic requirements	<ul style="list-style-type: none"> • Tropical • Subtropical • Temperate • Boreal • Arctic • Deserts 	
	Classification by growth habit	<ul style="list-style-type: none"> • Trees, shrubs or vines 	
	Classification by leaf retention	<ul style="list-style-type: none"> • Deciduous or Evergreen 	
	Classification by life span	<ul style="list-style-type: none"> • Annual • Biennials • Perennial • Combination 	

Topic	Subtopic	Content	Examples (including but not limited to)
Plant Science continued	Agronomic classification	<ul style="list-style-type: none"> • Forage <ul style="list-style-type: none"> - Grass (Annual and Perennial) - Legume • Pulse • Grain or cereal • Small grain • Cover crop • Catch crop • Green manure crop • Companion or nurse crop • Hay • Row crop • Silage • Soilage crop • Trap crop • Oil seed crop • Fibre crop • Root and tuber crop • Sugar crop • Drug/stimulant/beverage crop • Essential oil crop • Rubber crop 	
	Flowers and shrubs	<p>Flower crops</p> <ul style="list-style-type: none"> • The basic climatic and soil requirements of the following main types of flower crops extensively used in South Africa: <ul style="list-style-type: none"> - Fynbos – Diversity and agro-tourism - Garden flowers - Flowers as features - Cut flowers - Floral shops, festive seasons and special occasions <p>Shrubs and indigenous crops:</p> <ul style="list-style-type: none"> • The basic climatic and soil requirements for the following shrubs: <ul style="list-style-type: none"> - Rooibos and Roses 	
	Forestry	<ul style="list-style-type: none"> • <i>The concept: Forests vs plantation</i> (wood production) • The classification of the main groups of forests crops/trees <ul style="list-style-type: none"> - Hard wood types - Soft wood types • The distinction between natural forests (indigenous) and commercial plantations (exotic) • Reasons for promoting and growing protected trees/plant and eradicating invasive tree/plant 	

Topic	Subtopic	Content	Examples (including but not limited to)
Animal Science	General importance and economic value of farm animals	<ul style="list-style-type: none"> • Development and domestication of farm animals • The general economic importance of the livestock industry in South Africa with reference to: <ul style="list-style-type: none"> - Cattle – Beef, Milk and Hides - Sheep – Wool, Mutton, Pelt and Hides - Goats – Meat, Mohair and Hides - Pigs – Pork, Pork products and Bristle - Poultry – Broilers and Eggs - Horses, mules and donkeys – Work, Sport and Recreation - General by-products from animals (including but not limited to): <ul style="list-style-type: none"> • Manure, Bone meal, Carcass meal, Blood meal and Feather meal • The basic differences between ruminants and non-ruminants with relevant examples 	
	Classification of farm animals	<p>Cattle</p> <ul style="list-style-type: none"> • Classification according to: <ul style="list-style-type: none"> - Species <ul style="list-style-type: none"> ▪ <i>Bos indicus</i> (African or Asian types), <i>Bos taurus</i> (European type) and Composite breed made up of a <i>Bos indicus</i> crossed with <i>Bos taurus</i> - Production purpose <ul style="list-style-type: none"> ▪ Beef or meat, Dual purpose (meat and milk) and Milk • Classify by looking at: <ul style="list-style-type: none"> ▪ Basic structure, Functionality, Country of origin, Unique characteristics and Special adaptation features 	<p>Breeds:</p> <ul style="list-style-type: none"> • Beef breeds <ul style="list-style-type: none"> - Indigenous or locally developed breeds that include but are not limited to: <ul style="list-style-type: none"> ▪ <i>Afrikaner, Bonsmara, Drakensberger and Nguni</i> - Exotic breeds that include but are not limited to: <ul style="list-style-type: none"> ▪ <i>Hereford, Dexter, Bangus, Limousin, Aberdeen Angus, Brahman, Boran</i> • Dairy breeds including but not limited to: <ul style="list-style-type: none"> - <i>Holstein/Friesland, Jersey, Guernsey, Ayrshire</i> • Dual purpose breeds including but not limited to: <ul style="list-style-type: none"> - <i>Pinzgauer, Simmentaler</i>
		<p>Sheep</p> <ul style="list-style-type: none"> • Classification according to purpose: <ul style="list-style-type: none"> - Meat, Wool, Dual purpose and Pelt • Classify by looking at: <ul style="list-style-type: none"> - Basic structure, Functionality, Country of origin, Unique characteristics and Special adaptation features 	<p>Breeds:</p> <ul style="list-style-type: none"> • Wool breeds including but not limited to: <ul style="list-style-type: none"> - <i>Merino</i> • Dual purpose including but not limited to: <ul style="list-style-type: none"> - <i>Dohne Merino, SA Mutton Merino, Ile de France, Dormer</i> • Meat breeds including but not limited to: <ul style="list-style-type: none"> - <i>Damara, Persian, Van Rooy, Dorper</i> • Pelt breeds including but not limited to: <ul style="list-style-type: none"> - <i>Karakul</i>

Topic	Subtopic	Content	Examples (including but not limited to)
Animal Science continued	Classification of farm animals continued	<p>Goats</p> <ul style="list-style-type: none"> • Classification according to purpose: <ul style="list-style-type: none"> - Meat, Dual purpose, Dairy/milk, Fibre • Classify by looking at: <ul style="list-style-type: none"> - Basic structure, Functionality, Country of origin, Unique characteristics, Special adaptation features 	<p>Breeds:</p> <ul style="list-style-type: none"> • Meat breeds including but not limited to: <ul style="list-style-type: none"> - <i>Boer, Savanna, Kalahari Red</i> • Milk/dairy breeds including but not limited to: <ul style="list-style-type: none"> - <i>Saanen, British Alpine, Toggenburg</i> • Dual purpose including but not limited to: <ul style="list-style-type: none"> - <i>Nguni, Xhosa Lob Eared, Northern Cape Speckled</i> • Fibre breeds including but not limited to: <ul style="list-style-type: none"> - <i>Angora</i>
		<p>Pigs</p> <ul style="list-style-type: none"> • Classified according to level of “commercial improvement” <ul style="list-style-type: none"> - Unimproved/indigenous, Improved • Classify by looking at: <ul style="list-style-type: none"> - Basic structure, Functionality, Country of origin, Unique characteristics, Special adaptation features 	<p>Breeds:</p> <ul style="list-style-type: none"> • Unimproved breeds including but not limited to: <ul style="list-style-type: none"> - <i>Kolbroek, Transki Black, Pot Bellied</i> • Improved breeds including but not limited to: <ul style="list-style-type: none"> - <i>Large White, Duroc, Landrace, Pietrain, Commercial pigs</i>
		<p>Poultry</p> <ul style="list-style-type: none"> • Classification according to purpose: <ul style="list-style-type: none"> - Meat production, Egg production, Dual purpose • Classify by looking at: <ul style="list-style-type: none"> - Basic structure, Functionality, Country of origin, Unique characteristics, Special adaptation features 	<p>Breeds:</p> <ul style="list-style-type: none"> • Meat breeds <ul style="list-style-type: none"> - <i>Broiler</i> • Egg <ul style="list-style-type: none"> - <i>Laying hen</i> • Dual purpose <ul style="list-style-type: none"> - Indigenous including but not limited to: <ul style="list-style-type: none"> ▪ <i>Naked Neck, Venda, Ovambo, Potchefstroom Koekoek</i> - Exotic including but not limited to: <ul style="list-style-type: none"> ▪ <i>Rhode Island Red, Australorp, Cornish Game, Plymouth Rock, Leghorn</i>
		<p>Horses, donkeys and mules</p> <ul style="list-style-type: none"> • Classification according to species: <ul style="list-style-type: none"> - Horses, Donkeys, Mules • Classification according to purpose: <ul style="list-style-type: none"> - Light/riding, Draught • Classify by looking at: <ul style="list-style-type: none"> - Basic structure, Functionality, Country of origin, Unique characteristics, Special adaptation features 	<p>Breeds:</p> <ul style="list-style-type: none"> • Light/riding breeds including but not limited to: <ul style="list-style-type: none"> - <i>Thoroughbreds, Arabs, Quarter horses</i> • Draught breeds including but not limited to: <ul style="list-style-type: none"> - <i>Shire, Percheron, Clydesdale</i>

Topic	Subtopic	Content	Examples (including but not limited to)
Animal Science continued	Classification of farm animals continued	<p>Game</p> <ul style="list-style-type: none"> • Classification according to: <ul style="list-style-type: none"> - Species - Dietary requirements <ul style="list-style-type: none"> ➢ Herbivore (Selective grazer, Bulk grazer, Browser), Omnivore, Carnivore (Predator, Scavenger) - Habitat - Natural distribution - Habits <ul style="list-style-type: none"> ➢ Diurnal or nocturnal • Classify by looking at: <ul style="list-style-type: none"> -Basic structure, Functionality, Country of origin, Unique characteristics, Special adaptation features 	<p>Breed/species</p> <ul style="list-style-type: none"> • Herbivores including but not limited to: <ul style="list-style-type: none"> - Rhinoceros, Elephant, Buffalo, Kudu, Eland, Springbok, Reedbuck • Omnivores <ul style="list-style-type: none"> - Monkeys, Baboons, Warthog • Carnivores <ul style="list-style-type: none"> - Lion, Leopard, Karukul/Lynx, Hyena, Jackal
	Behaviour and handling of farm animals	<p>Behaviour of farm animals</p> <ul style="list-style-type: none"> • The common behaviours of the following farm animals under various conditions: <ul style="list-style-type: none"> • Large ruminants (cattle), Small ruminants (sheep), intensive non-ruminants (pigs); and Poultry. <p>Handling of farm animals</p> <ul style="list-style-type: none"> • The reasons/importance of handling farm animals • The effect of incorrect handling on farm animals (harm and effect) • The basic guidelines for handling the following farm animals: <ul style="list-style-type: none"> • Large ruminants (cattle), Small ruminants (sheep), intensive non-ruminants (pigs); and Poultry. • The different techniques/tools/aids utilized to handle farm animals • The basic guidelines/requirements for transporting/moving farm animals from one farm to another/abattoirs 	

Topic	Subtopic	Content	Examples (including but not limited to)
Agricultural Economics continued	Agricultural legislation	<ul style="list-style-type: none"> • <i>The following legal concepts:</i> <ul style="list-style-type: none"> - The Constitution - Green Paper - Agricultural legislation/Laws (basic legislation) - Amendments (Law) and - Regulation/by laws • The aims/purposes of agricultural legislation • The important Laws which affect agriculture (directly or indirectly) such as: <ul style="list-style-type: none"> - Labour, Land, Marketing, Resource protection, Disease control and Chemicals 	
	Agricultural organizations	<ul style="list-style-type: none"> • The basic aims of agricultural organizations • The national, provincial and local levels of agricultural organizations (with relevant examples) • The roles of the following agricultural organizations found in South Africa: <ul style="list-style-type: none"> - Agricultural Research Council (ARC) - National Agricultural Marketing Council (NAMC) and - Council for Scientific and Industrial Research (CSIR) • At least FOUR benefits/advantages of nationally recognized agricultural Organization for individual farmers 	
Basic Genetics and Biological Concepts	Plant and animal cells	<ul style="list-style-type: none"> • <i>The basic concept: cell, tissue and organs in living organism</i> • Organizational levels of a multi-cellular organism • Plant and animal cells including: <ul style="list-style-type: none"> - Labelled diagrams - Identification of the main cell structures and organelles - Functions in both plant and animal cells • Differences between an animal cell and a plant cell 	
	Cell division	<ul style="list-style-type: none"> • <i>The concept: cell division</i> • The cell division process and its application (the importance of cell division in plants and animals) • The types of cell division in plants and animals (mitosis and meiosis) • The description of process of both mitosis and meiosis cell division • The identification/description of the phases of mitosis and meiosis • How cell division (mitosis and meiosis) takes place • The differences between mitosis and meiosis 	

Topic	Subtopic	Content	Examples (including but not limited to)
Basic Agricultural Chemistry	Basic agricultural chemistry	Introduction to basic chemistry <ul style="list-style-type: none"> • <i>The following terminology:</i> matter, atom, molecules, periodic table and isotopes • The differences between elements, compounds and mixtures (with relevant examples) • The basic interpretation of the periodic table of elements • The difference between acids and bases • The general structure of an atom • The main types of particles of an atom and their respective charges • The relation between atomic numbers and number of particles in the nucleus • The formation of ions • The arrangement of electrons around the nucleus and valency 	
	Chemical bonding	<ul style="list-style-type: none"> • A basic chemical bonding as it occurs to form a molecule • The following chemical bonding with their respective structural formulae: <ul style="list-style-type: none"> - covalent bonding (hydrogen gas, water, etc.); and - ionic bonding (copper chloride, sodium chloride, etc.). 	
	Organic and inorganic compound	<ul style="list-style-type: none"> • The distinction between inorganic and organic compounds (with examples) • The chemical formulae, structural formulae, Lewis structures, importance and functions of the following inorganic compounds: <ul style="list-style-type: none"> - water - Carbon dioxide - mineral salts, for example sodium chloride/table salt and - Ammonia • The characteristics of the carbon atom (bonding on the carbon atom) and organic substances • The basic grouping of organic compounds 	
	Alkanes and alcohols	Alkanes <ul style="list-style-type: none"> • The basic types of alkanes (not more than 5 carbon atoms) • Their chemical and structural formulae • Their importance in plants and animal metabolism • <i>The concept:</i> isomers as illustrated by simple alkane structures Alcohols <ul style="list-style-type: none"> • The basic types of alcohols (their structures and importance) with reference to methanol and ethanol • Comparison between alcohols and alkanes based on their general structural formulae 	

Topic	Subtopic	Content	Examples (including but not limited to)
Basic agricultural chemistry continued	Fatty acids and bio- molecules Lipids/fats	Fatty acids <ul style="list-style-type: none"> The chemical structure of a simple fatty acid Differentiation between saturated and unsaturated fatty acids (their structures and importance) The differences between fatty acids and alcohols based on their structural formulae Bio-molecules Lipids <ul style="list-style-type: none"> basic composition of a simple lipid/fat; The differences between fats and oils, saturated and unsaturated fats; and The main functions/importance of lipids/fats in living organisms. 	
	Proteins	<ul style="list-style-type: none"> General structure of the monomers of proteins (amino-acids) The differences between simple and complex proteins (also refer to essential amino acids and non-essential amino acids) The general structural of polypeptides/simple proteins The synthesis and hydrolysis of proteins The main functions/importance of proteins in living organisms 	
	Carbohydrates	<ul style="list-style-type: none"> The basic chemical composition of carbohydrates The general formulae of carbohydrates Structural and chemical formulae of simple sugars (monosaccharides) The main classifications of carbohydrates - monosaccharide, disaccharides and polysaccharide (with relevant examples) The main functions of carbohydrates in living organisms 	
Agro-ecology	Ecology and agro-ecology	<p><i>The concepts: ecology, levels of organization (individual, species, population, community, ecosystem, biome, biosphere)</i></p> <ul style="list-style-type: none"> <i>The concepts: agro-ecology, agro-ecosystems</i> Components of ecosystems <ul style="list-style-type: none"> Biotic and abiotic factors The biotic and abiotic factors/components influencing an ecosystem: <ul style="list-style-type: none"> <i>Abiotic factors:</i> <ul style="list-style-type: none"> Physiographic factors (slope, aspect, altitude); Climatic factors (sunlight, temperature, rainfall and wind) and Edaphic/soil factors (soil texture, soil depth, soil water, soil fertility); and Biotic factors: <ul style="list-style-type: none"> Producers; Consumers and Decomposers 	

Topic	Subtopic	Content	Examples (including but not limited to)
Agro-ecology continued	Interactions in ecosystems and ecological farming	<ul style="list-style-type: none"> • Energy flow in ecosystems <ul style="list-style-type: none"> - Food chains, Food webs and Food pyramids • Nutrient cycling in ecosystems <ul style="list-style-type: none"> - Water cycle; Carbon cycle; Nitrogen cycle • Interaction between organisms in ecosystems <ul style="list-style-type: none"> - Competition; Predator-prey; Mutualism; Commensalism; Parasitism • Ecological farming methods or ecological farming systems including: <ul style="list-style-type: none"> - Organic; Biological; Conservation; Game and Sustainable/alternative farming 	
	Biomes of South Africa	<ul style="list-style-type: none"> • A description of the main types of biomes of South Africa based on the following: <ul style="list-style-type: none"> - Location, climate, fauna and flora • Identification of the location of the main biomes on a map of Southern African • The human impact on the biomes of Southern Africa • The importance/significance of these biomes for Agriculture 	
	Climate change or effects of weather phenomena	<p><i>The concept: climate change and global warming</i></p> <ul style="list-style-type: none"> • The main factors that cause global warming • The impact of climate change or global warming on Agriculture • Long term weather predictions and cyclic pattern of rainfall in South Africa • Short term climate and weather predictions (weather bureau) • Agricultural adaptation measures to overcome climate change 	

GRADE 11

Topic	Subtopic	Content	Examples (including but not limited to)
Soil Science	Soil texture	<ul style="list-style-type: none"> • <i>The concept: soil texture</i> • The main groupings of soil particles (clay, silt and sand) that determine the soil textures and their respective diameters • Scientific method to determine the quantity of sand, silt and clay in a soil sample (use of a sieve/mechanical/chemical method) • Determination of the textural classes (soil texture triangle) of soil and interpretation of textural triangle • The influences of sand and clay particle size/texture on soil characteristics/behaviour • The two field methods to determine the soil texture class: <ul style="list-style-type: none"> - Sausage method and feeling method • The most important reasons for a farmer to know the textural class of his/her farm land 	
	Soil structure	<ul style="list-style-type: none"> • <i>The concept: soil structure</i> • The classification/types of soil structures (shape and size) • The factors influencing the development and stability of soil structure • The factors or malpractices that cause the destruction/decline in soil structure • The different methods which farmers can apply to improve a poor soil structure • The advantages of good soil structure with reference to: <ul style="list-style-type: none"> - The prevention of soil compaction - Crusting - Soil erosion - Salt imbalances and - limiting the effect of a drought and limit excessive wetness 	
	Soil colour and soil pores	<p>Soil colour</p> <ul style="list-style-type: none"> • Differences between a homogeneous and non-homogenous soil colour • The main factors that determine the colour of soil • The interpretation of the following soil colours: <ul style="list-style-type: none"> - Dark, Red, Light, Yellow, Greyish coloured and Mottled appearance <p>Soil pores</p> <ul style="list-style-type: none"> • The effect of soil texture, soil structure, soil depth and soil cultivation on the total pore space in a soil • The differences between macro pores and micro pores and their functions in a soil • The bulk density and porosity • The definitions of soil bulk density and porosity • Ways to determine, calculate and interpret the bulk density of a soil 	

Topic	Subtopic	Content	Examples (including but not limited to)
Soil Science continued	Soil air	<ul style="list-style-type: none"> • Factors that influence the bulk density • The factors that affect/influence storage and movement of soil air • Comparison between atmospheric and soil air (based on the nitrogen, oxygen and carbon dioxide content) • The importance/necessity of the following soil gases: oxygen, carbon dioxide and nitrogen 	
	Soil moisture	<ul style="list-style-type: none"> • The basic types of soil water and their characteristics • A description of soil water losses and ways to limit these losses • The forces of nature that have an effect on soil water (adsorption, electrostatic, capillarity, bonding, cohesion, etc.) • The different movements of water through the soil • The availability of soil water to a plant at the following limits of soil water content: <ul style="list-style-type: none"> - Saturation point; Field water capacity; Temporary wilting point; and Permanent wilting point. • Scientific methods to illustrate the following aspects that are related to soil water: <ul style="list-style-type: none"> - capillary; and Gravitational movement of water • Effective soil water management (based on the manipulation of the soil water balance) 	
	Soil temperature	<ul style="list-style-type: none"> • The main factors influencing soil temperature • The scientific approach to measure the effect of these factors that influence soil temperature • The effects of soil temperature on physical, chemical and biological processes that take place in the soil • The ways/methods to manipulate soil temperature for better production (cultivation methods and controlled environment) 	
	Soil colloids	<ul style="list-style-type: none"> • The description and characteristics of inorganic soil colloids • The differences between inorganic and organic colloids, cation adsorption and cation exchange in soil • manipulation of the cations and cation exchange in the soil 	
	Soil acidity	<ul style="list-style-type: none"> • The pH scale and hydrogen ions concentration • <i>The concepts: soil acidity</i> (predominant cations). • The distinction between active acidity and reserve acidity • The factors influencing/causing the soil acidification process • The effects of soil acidity on crop production • The methods of preventing/controlling soil acidification • The exchange reaction in the soil that occurs during the reclamation process (chemical reaction) 	

Topic	Subtopic	Content	Examples (including but not limited to)
Soil Science continued	Soil alkalinity and salinity	<ul style="list-style-type: none"> • <i>The concept: soil alkalinity</i> (predominant anions) • The differences between saline soils and sodic soils • The characteristics of saline soils/white brack soils • The factors influencing/causing brackishness/soil alkalinity/saltiness • The effects of alkaline/brack on crop productivity • The methods of preventing/controlling soil alkalinity • The procedures to be followed on the reclamation of alkaline/brackish soils 	
	Soil organisms	<ul style="list-style-type: none"> • The differences between soil micro-organisms and macro-organisms (with examples) • The main groups of soil micro-organisms (with examples) • The importance and roles of soil micro- and macro-organisms • The requirements for soil micro- and macro-organisms • The carbon cycle/conversion by micro-organisms • The nitrogen cycle/conversion by micro-organisms • The process of symbiosis based on the following: mycorrhiza (fungus) and <i>Rhizobium</i> bacteria. • <i>The terminology:</i> ammonification, nitrification, denitrification, nitrogen assimilation, solubilisation, immobilization and mineralization 	
	Soil organic matter	<ul style="list-style-type: none"> • <i>Definitions of the following concepts:</i> fresh organic matter and humus • The physical, chemical and biological effects of organic matter on soils • The factors affecting the balance between gains and losses of organic matter in soils • The effects of the decline in organic matter content on soil degradation 	
Plant Science	Photosynthesis	<ul style="list-style-type: none"> • The schematic representation of photosynthesis • The differences between photosynthesis and respiration • The main pigment involved with photosynthesis and its function in plants • The importance/role of photosynthesis • The dark and light reaction/phases of photosynthesis • The storage of food and various organs utilized for food storage in plants • The factors influencing the rate of photosynthesis • The manipulation of plants to increase the photosynthetic rate 	

Topic	Subtopic	Content	Examples (including but not limited to)
Plant Science continued	Water and nutrients	<p>Absorption and storage of water and nutrients</p> <ul style="list-style-type: none"> • The importance/functions of water in plants • The movement of water from the soil to the roots of plants • The distinctions between osmosis and diffusion • <i>The differences between the following processes:</i> movement of water from the roots to the stems and leaves, movement of water from the leaf to the air (atmosphere) • <i>The terms:</i> transpiration pull and osmotic flow • Plants' adaptation features to reduce transpiration rate (how plants control transpiration) • movement of the products of photosynthesis (nutrients) 	
	Mineral nutrition macro- and micro-elements	<ul style="list-style-type: none"> • The difference between micro/trace elements and macro-elements • <i>The different macro-elements:</i> Nitrogen, sulphur, phosphorus, potassium, calcium and magnesium (the importance/functions, form in which it is absorbed and the deficiency symptoms of each) • <i>The different micro-elements:</i> iron, manganese, boron, zinc, copper, molybdenum and cobalt (the importance/functions, form in which it is absorbed and the deficiency symptoms of each) 	
	Plant nutrient uptake and analysis	<ul style="list-style-type: none"> • The plant nutrient/mineral uptake based on the following: <ul style="list-style-type: none"> • passive ion uptake by diffusion; and • active ion uptake by transport carrier molecules. • The forms in which nutrients/minerals are available to plants • The factors affecting/influencing nutrients/mineral such as phosphorus, potassium and nitrogen availability to plants • The importance of nutrient element analysis in crop production • methods utilized in crop production to determine the nutritional status of the soil (soil samples, plant/leaf samples) 	
	Fertilizers and fertilization practices	<ul style="list-style-type: none"> • A definition of the term fertilizer • The difference between organic and inorganic fertilizers <p>Inorganic fertilizers</p> <ul style="list-style-type: none"> • The main nitrogenous, phosphorus and potassium inorganic fertilizers (their uses/applications with relevant examples) • The calculation of the percentages of each plant nutrient in the fertilizer mixtures/multi-fertilizer mixtures • Impact of inorganic fertilizers on the environment <p>Agricultural lime:</p> <ul style="list-style-type: none"> • The differences between calcitic and dolomitic lime; and • the beneficial effects of liming (physical, chemical and biological effects). <p>Gypsum: The use of gypsum</p>	

Topic	Subtopic	Content	Examples (including but not limited to)
		<p>Organic fertilizers</p> <ul style="list-style-type: none"> • The main types of organic fertilizers • impact of organic fertilizers on the environment <p>Green manure</p> <ul style="list-style-type: none"> • <i>The concept:</i> green manure/manuring • The purpose/beneficial effects of green manuring • The characteristics of green manure crops <p>Farm manure</p> <ul style="list-style-type: none"> • Description of farm manure • The types of farm manure • The factors that affect/influence the composition of farm manure <p>Compost</p> <ul style="list-style-type: none"> • The description of compost • The preparation and requirements for compost production • The beneficial effects of compost (physical, chemical and biological effects) on plant growth • The common agricultural organic products and by products used to supplement plant nutrients <p>Fertilization practices</p> <ul style="list-style-type: none"> • <i>The different methods of fertilizer applications in relation to:</i> soil application (band placing, liquid or gas application or broadcasting), foliar application, application through irrigation water (fertigation), aerial application, top-dressing and plant mixtures (with examples of fertilizers which can be used) 	
Plant Sciences continued	Plant pests and control	<p>Plant pests and their control</p> <ul style="list-style-type: none"> • <i>The terminology:</i> pesticides • The description of main groups of plant pests and life-cycles of some of plant pests • The types of damage caused by plant pest on crops • The preventative/control measures/methods of plant pests integrated Pest management control (iPm) 	
	Invasive alien plant, weeds and their control	<p>Weed management</p> <ul style="list-style-type: none"> • <i>The following terminologies:</i> weeds and herbicides • The harmful effects of weeds on plant growth • The adaptation features/modes of weeds which let them grow more easily than cultivated crops • The agents of weed dispersion/transmission from one field to the other • <i>The description of the methods of weed control:</i> mechanical, chemical, biological and integrated weed control management 	

Topic	Subtopic	Content	Examples (including but not limited to)
Plant Sciences continued	Plant diseases and control	<p><i>The concept:</i> Plant diseases and their control</p> <ul style="list-style-type: none"> • The types of micro-organisms causing diseases in plants • The various plant diseases caused by micro-organisms (mode of transmission, symptoms and affected plants): <ul style="list-style-type: none"> • Viral; Bacterial; and Fungal diseases • The preventative/control measures of plant disease 	
	Increasing plant production	<p>Intensive plant production systems</p> <ul style="list-style-type: none"> - Tie in with greenhouse etc. in sustainable natural resource utilization 	
	Integrated pest management and biological control	<p><i>The concept:</i> integrated pest management</p> <ul style="list-style-type: none"> • The benefits/advantages of practicing IPM by crop farmers • The fundamental principles/steps to be followed that determine iPm insect control in stored seed and grass • The conditions which influence/increases insect damages on stored seeds/grains • The life cycle of selected pests/insects of stored agricultural products • The various methods of controlling insects in stored seeds/grain The general role of the state in plant protection 	
Animal Science	Animal digestive systems	<ul style="list-style-type: none"> • <i>A comparison on the external structure of the alimentary canal of:</i> a ruminant (cow and sheep) and non-ruminant (fowl and pig) • Functions and adaptations of various structures of the alimentary canal • Type of digestion <ul style="list-style-type: none"> - Mechanical and Chemical digestion (enzymes) • Examples of alimentary canals: <ul style="list-style-type: none"> - Monogastric (simple stomach) <ul style="list-style-type: none"> ▪ Pig - Ruminant <ul style="list-style-type: none"> ▪ Sheep, Cow and Goat - Hind gut fermenter <ul style="list-style-type: none"> ▪ Horse and Rabbit - Chicken 	

Topic	Subtopic	Content	Examples (including but not limited to)
Animal Science continued	Digestion in animals	<p>Digestion in non-ruminants</p> <ul style="list-style-type: none"> • A brief explanation of the intake of feed • The process of digestion in the: <ul style="list-style-type: none"> - Mouth, Stomach, small intestine and Large intestine: • Functions of the accessory glands such as the: <ul style="list-style-type: none"> - Liver, pancreas and Intestinal glands <p>Digestion in ruminants</p> <ul style="list-style-type: none"> • <i>Terminology</i>: rumination, regurgitation, peristalsis • Explanation of the intake of food, chewing of the cud • The differences between a mature ruminant and a young ruminant based on the four stomach compartments (size, functionality, etc.) • Digestion in the rumen <p><i>The concept: rumen microbes</i></p> <ul style="list-style-type: none"> • The different types of rumen microbes • Important requirements for normal functioning of rumen microbes/micro-organisms • The functions of the rumen microbes • The absorption of food in the rumen directly by osmosis and diffusion into the blood stream 	
	Components of feed	<ul style="list-style-type: none"> • The functions (importance) of each of the following: <ul style="list-style-type: none"> - Water - Proteins - Carbohydrates <ul style="list-style-type: none"> ▪ Sugar, Starch and Crude fibre - Fats and Oils (ether extract) in animal production and growth • The bio-chemical functions (importance and deficiencies) of the following mineral constituents: <ul style="list-style-type: none"> - <i>Macro-elements</i>: <ul style="list-style-type: none"> ▪ Calcium, Phosphorus, Magnesium, Sodium, Chlorine, Potassium, Sulphur - <i>Trace-elements</i>: <ul style="list-style-type: none"> ▪ Iron, Iodine, Zinc, Selenium, Copper, Cobalt • The functions and two deficiencies of the following vitamins: <ul style="list-style-type: none"> - <i>Water-soluble</i>: <ul style="list-style-type: none"> ▪ Vitamin B1, Vitamin B2, Vitamin B6, Vitamin B12 and Vitamin B complex - <i>Fat-soluble</i>: <ul style="list-style-type: none"> ▪ Vitamin A, Vitamin D, Vitamin E and Vitamin K 	

Topic	Subtopic	Content	Examples (including but not limited to)
Animal Science continued	Types of feed	<p>Classification of animal feeds</p> <ul style="list-style-type: none"> • <i>The concept: roughages, and concentrates</i> • The characteristics of roughages and concentrates • The description of different types of roughages and concentrates • The schematic representation of different types of animal feeds • The functions (importance) of roughages and concentrates <p>subdivision of feeds</p> <ul style="list-style-type: none"> • The comparison between protein-rich and carbohydrate-rich types of feeds (examples of protein-rich and carbohydrate-rich feeds) <p>Supplements to rations</p> <ul style="list-style-type: none"> • <i>The different ways of supplementing: minerals, vitamins, non-protein nitrogen and growth stimulants</i> 	
	Digestibility of feeds	<p><i>The concepts: digestibility and digestibility coefficient of feeds</i></p> <ul style="list-style-type: none"> • The factors that affect/influence/determine the digestibility of feeds • The methods of improving/increasing digestibility of feeds • Calculation and interpretation of the digestibility coefficient of a feed 	
	Quality of feed, energy value of feeds and nutritive ratio	<p><i>The concepts: biological value (BV), essential amino acid index and ideal proteins</i></p> <ul style="list-style-type: none"> • The importance of animal proteins in rations • The evaluation of feed protein in terms of biological value, for example egg and milk <p>Energy value of feed</p> <ul style="list-style-type: none"> • The units in which energy value is expressed • <i>The terminology:</i> <ul style="list-style-type: none"> - Gross energy, Metabolic energy, Digestible and Nett energy • The purpose/aims of calculating energy value of the feed • Schematic representation of feed energy flow • Calculation of feed energy flow and interpretation of the results <p><i>The concept: nutritive ratio (NR)</i></p> <ul style="list-style-type: none"> • The purpose/aims of nutritive ratio in animal feeding • Calculation of the nutritive value of a feed and interpretation of the results 	

Topic	Subtopic	Content	Examples (including but not limited to)
Animal Science continued	Planning a feed flow programme	<p>Planning a feed flow programme</p> <ul style="list-style-type: none"> • <i>The terminology:</i> feed flow program, maintenance and production ration • A brief overview of the Pearson square method (feed formulation) • Calculation and the drawing of feed requirements using a Single Pearson Square method • The interpretation of the Pearson Square results for feed mixtures • Fodder/feed flow/fodder production planning • The importance of fodder flow/fodder production planning <p>Basic calculation of a feed/fodder flow program for a group of livestock (number of animals and feed needed over a period of time)</p>	
	Plant and metallic salt poisoning	<p>Plant and metallic salt poisoning</p> <ul style="list-style-type: none"> • <i>The most important plant poisoning:</i> maize fungus, poison bulb, thorn apple, etc. • The treatment of animals suffering from plant poisoning • The preventative/control measures of plant poisoning <p>Poisoning by metallic salts:</p> <ul style="list-style-type: none"> • <i>Common salt poisoning (the symptoms and treatment):</i> salt poisoning and urea poisoning • The preventative/control measures of salt poisoning 	
	Animal shelter/protection/housing	<p>Animal shelter/protection/housing</p> <ul style="list-style-type: none"> • The importance or reasons for shelter/housing • The different structures used for sheltering/housing livestock <p>Intensive animal production systems</p> <ul style="list-style-type: none"> • The different intensive production systems: <ul style="list-style-type: none"> - Backyard systems; intensive/semi-intensive systems; and Free range systems (poultry/pig/dairy production systems). • The basic housing or shelter requirements/guidelines for an intensive production system (holding shed, feed shed, holding pens, etc.) <p>The different equipment/tools for intensive housing systems (feeders, water supply, bedding and lighting, etc.)</p>	

Topic	Subtopic	Content	Examples (including but not limited to)
Animal Science continued	Increasing animal production	Animal production systems <ul style="list-style-type: none"> • Description and comparison of intensive and extensive animal production systems • The differences between small-scale/subsistence and large-scale/commercial farming systems Examples of intensive farming productions <ul style="list-style-type: none"> • Factors to increase animal production under intensive farming (broiler production): <ul style="list-style-type: none"> - Nutrition/feeding; Environment; Reproduction/breeding; and General enterprise management. Examples of extensive farming productions <ul style="list-style-type: none"> • Factors to increase animal production in extensive farming (beef production): <ul style="list-style-type: none"> - Nutrition/feeding; Environment; Reproduction; and General production enterprise management 	
Sustainable natural resource utilization	Water management	<ul style="list-style-type: none"> • The criteria to define water quality <i>The concepts: water source and water supply (scarcity of water)</i> <ul style="list-style-type: none"> • The different sources of water utilized in Agriculture/farming industry • The different forms/ways in which water is used specifically in Agriculture • Factors that affect the supply of water in Agriculture • The basic agricultural practices/activities that contribute to the: <ul style="list-style-type: none"> - Pollution of soil water; Subsoil or ground water and Surface water (water quality) • The appropriate management practices/strategies which can be adopted to prevent and control water pollution including the National Water Act of 1998 	
	Water use/irrigation	Water use <ul style="list-style-type: none"> • <i>The terminology:</i> irrigation, irrigation schedule • The main sources of water for irrigation • The criteria to determine water quality for irrigation • The irrigation systems (advantages and disadvantages and conditions to use): <ul style="list-style-type: none"> - flood irrigation/furrow and basin irrigation; - sprinkler irrigation/centre pivot; and - Drip irrigation/micro-irrigation • The reasons or advantages of irrigation scheduling • The use of the following instruments to determine the moisture content of soils: <ul style="list-style-type: none"> - Class A evaporation pan; Tensiometer; and Neutron moisture meter. 	

Topic	Subtopic	Content	Examples (including but not limited to)
Sustainable natural resource utilization	Soil drainage systems	Soil drainage systems <ul style="list-style-type: none"> • <i>The term:</i> soil drainage • Different types of soil drainage systems • The critical areas which should be considered before installation of a pipe drainage system in the field 	
	Soil cultivation and crop rotation	Soil cultivation <ul style="list-style-type: none"> • The aims of primary and secondary soil cultivation • Different types of common implements utilized for soil cultivation • Differentiation between primary and secondary soil cultivation • The description and comparison of different types of soil cultivation systems Crop rotation <ul style="list-style-type: none"> • <i>The concept:</i> crop rotation • The differences between monoculture and crop rotation • The factors which play a fundamental role when a farmer plans a crop rotation programme • The advantages and disadvantages of crop rotation 	
	Greenhouse, hydroponics and aquaponics	<i>The concept: greenhouse</i> <ul style="list-style-type: none"> • The benefits/advantages and disadvantages of having a greenhouse for production of high value cash crops • The types of materials used by farmers to construct a greenhouse • The environmental factors to be considered when selecting/choosing the general locality of the greenhouse <i>The concept: hydroponics production system</i> <ul style="list-style-type: none"> • The advantages/benefits of hydroponics production systems • Growing mediums that will support plants which can be used by growers in hydroponics systems • The advantages and disadvantages of closed and open systems in hydroponics' production • The differences between production in a hydroponic system and open field system <i>The concept: aquaculture</i> <ul style="list-style-type: none"> • Common species which are included in aquaculture farming in South Africa • The common and simple structures that can be used for housing both marine and fresh water species • <i>The description of the fish culture systems:</i> open through flow system and closed or recirculation system • The basic requirements for aquaculture farmers to achieve high yields • The factors which may restrict farmers from choosing certain species for aquaculture farming 	

GRADE 12

Topic	Subtopic	Content	Examples (including but not limited to)
Soil Science	Classification	<ul style="list-style-type: none"> Description of soil classification and the use of a binomial soil classification systems in South Africa The procedures to be followed when identifying and classifying soil by the binomial system The reasons/purposes/value of the classification of soils in agriculture The description of diagnostic horizons of the topsoil and subsoil horizons 	
Sustainable natural resource utilization	Soil surveying and planning	<p>Soil surveying and planning</p> <ul style="list-style-type: none"> <i>The concept:</i> soil survey The purpose (aims and principles) of soil survey The soil survey process in agriculture and steps which need to be followed during soil surveying <p>Precision farming</p> <ul style="list-style-type: none"> <i>The concept:</i> precision farming The basic principles/aims of precision farming The main ultra-modern technologies utilized with precision farming 	
	Soil conservation and management	<p><i>The concept: soil degradation</i></p> <ul style="list-style-type: none"> The types (physical, biological and chemical degradations) and processes of soil degradation (focus on causes, adverse effects and control) The impact of soil degradation on agricultural productivity 	
	Agricultural pollution	<p><i>The concept: agricultural pollution and different types of pollution</i></p> <ul style="list-style-type: none"> The major kinds/types of soil pollutants: <ul style="list-style-type: none"> Causes Effects and Control measures The economic impact of soil pollutants on natural resource sustainability for agricultural production Waste management in Agriculture 	
	Natural resource legislation	<ul style="list-style-type: none"> Environmental legislation Responsible farming 	

Topic	Subtopic	Content	Examples (including but not limited to)
Plant Science (Methods of plant reproduction and propagation)	Sexual reproduction (flowering, pollination and fertilization)	<ul style="list-style-type: none"> • Definition of sexual reproduction in plants • The functions and structures of the following parts of a flower: <ul style="list-style-type: none"> - Stamen; Pistil; and - Non-sexual parts, for example petals (corolla); sepals (calyx). <p><i>The concept:</i> pollination</p> <ul style="list-style-type: none"> • The differences between self-pollination and cross pollination • The description of the main agents of pollination • The structure of a matured/ripe pollen grain and a receptive stigma (use illustration/diagrams to explain) • The germination of a ripe pollen grain on a receptive stigma until fertilization (use illustration/diagrams to explain) <p>Fertilization process</p> <ul style="list-style-type: none"> • <i>The terminology:</i> fertilization and double fertilization • The development of a fertilized ovule to form a seed/fruit (structural development) • The distinction between vegetative and stimulative parthenocarpy 	
	Fruit setting and fruit ripening	<p>Seeds and fruits setting</p> <ul style="list-style-type: none"> • <i>The concept:</i> fruit setting • The development of seeds/fruits from a fertilized flower (structures) • The different types of fruits according to the way in which they develop such as simple, compound, multiple and accessory fruits 	
	Seed germination	<p>Seed germination</p> <ul style="list-style-type: none"> • The process of seed germination • The distinction between seed dormancy and scarification • The basic requirements for seed germination 	
	Asexual /vegetative reproduction (corms, stolons, rhizomes, roots, leaves and tubers)	<ul style="list-style-type: none"> • <i>The concept:</i> asexual reproduction/vegetative reproduction in plants • Types of asexual methods of reproduction (bulbs, tubers, cuttings, stolons and rhizomes) • The advantages and disadvantages of using asexual reproduction methods to propagate plants • Division, cuttings, budding and grafting 	

Topic	Subtopic	Content	Examples (including but not limited to)
Plant Science continued	Plant improvement and biotechnology	<p>Plant improvement</p> <ul style="list-style-type: none"> • <i>Description of the methods used in plant breeding:</i> selection, hybridization (hybrid seeds) and mutation • The use of gene mutation by plant breeders to improve plant production <p>Biotechnology</p> <ul style="list-style-type: none"> • <i>The concept: biotechnology</i> • The advantages and disadvantages of genetic modified crops/plants (GmOS) • The characteristics of GmOs • Examples of genetically modified crops in South Africa, for example maize (Bt maize) and cotton (Bt cotton), etc. 	
	Plant production legislation	<ul style="list-style-type: none"> • Genetically Modified Organisms • Plant breeding • Alien vegetation • Pesticides 	
Animal Science	Male and female reproductive systems	<p>Reproductive organs of cattle</p> <ul style="list-style-type: none"> • The (primary and secondary) male reproductive organs (structure) • The functions and structures of the following organs: <ul style="list-style-type: none"> - Testes; epididymis; Scrotum; The accessory sex glands (vesicular glands; prostate; Cowper's gland) • The process of sperm formation (spermatogenesis) and the schematic representation of spermatogenesis • The factors causing sterility and infertility in bulls • The primary and secondary female reproductive organs (structure) • The functions and structures of the following organs: <ul style="list-style-type: none"> - Ovaries; Fallopian tubes; Uterus; and Vagina. • The process of ovogenesis/oogenesis and the schematic representation of ovogenesis/oogenesis <p>Oestrus and oestrus cycle</p> <ul style="list-style-type: none"> • <i>The concept:</i> oestrus/heat period • The female sex hormones and their respective functions • The periods/stages/phases of the oestrus cycle in cows • The noticeable signs/characteristics of oestrus in cows • The practical methods dairy farmers can adopt to assist in identifying cows on heat 	

Topic	Subtopic	Content	Examples (including but not limited to)
Animal Science continued	Synchronization of oestrus and mating	<p>Synchronization of oestrus</p> <ul style="list-style-type: none"> • <i>The concept:</i> synchronization of oestrus/heat • Various techniques/methods of synchronization of oestrus/heat • The advantages and disadvantages of synchronization of oestrus • The factors causing sterility and infertility in females (cow) mating • <i>Terminology:</i> mating/copulation, ejaculation, etc. • The different methods of mating farm animals: <ul style="list-style-type: none"> - Natural mating <ul style="list-style-type: none"> o The male sexual display/courtship behaviour/pattern o The factors that regulate mating behaviour among bulls o The five main stages of mating/copulation <p>Fertilization and pregnancy</p> <ul style="list-style-type: none"> • <i>The following reproduction terminology:</i> fertilization, pregnancy/gestation, freemartins, placenta, etc. • Fertilization process • The formation of multiple births (twins) and freemartins • The phases/stages of pregnancy • The reasons for abortions 	
	Artificial mating (Artificial insemination, embryo transplantation and cloning)	<p>Artificial insemination (AI)</p> <ul style="list-style-type: none"> • <i>The concept:</i> artificial insemination • The main requirements for successful Ai • The advantages and disadvantages of Ai • The methods of collecting semen: <ul style="list-style-type: none"> - Artificial vagina; and Electrical stimulation/electro-ejaculator • The basic requirements for semen collection • The characteristics of good quality semen (semen evaluation) • <i>Types of semen:</i> dilutants and functions of such dilutants • The basic requirements for storage of collected semen • The correct time for artificial insemination (timing for AI) • The correct technique for carrying out Ai <p>Embryo transplantation/transfer (ET)</p> <ul style="list-style-type: none"> • <i>Terminology:</i> embryo transplantation/transfer (ET), superovulation, embryo flushing/harvesting, donor cows, recipient cows • <i>The aims/purposes of ET:</i> description of embryo flushing/harvesting • The advantages and disadvantages of ET <p>Nuclear transfer (cloning)</p> <ul style="list-style-type: none"> • <i>The concept:</i> nuclear transfer/cloning • The aims/purposes of animal cloning • Types of cloning processes such as reproductive cloning and therapeutic 	

		cloning <ul style="list-style-type: none"> The advantages and disadvantages of cloning 	
Animal Sciences continued	Birth/parturition and dystocia	Birth/parturition and dystocia <ul style="list-style-type: none"> <i>The concept:</i> parturition/birth, dystocia The signs/characteristics of a cow approaching parturition The functions of the layers covering the foetus The stages/phases of parturition The correct birth positions of a calf in the uterus just before birth the conditions which interfere with normal parturition process; and the principal factors causing the retention of the placenta/afterbirth in cows. 	
	Milk production/lactation	Milk production/lactation <ul style="list-style-type: none"> <i>The concept:</i> lactation, dry period, milk ejection The structure of the udder of a cow (functions) The milk ejection/milk let down process and hormones involved The importance and functions of colostrums to the new born calf The interpretation of the lactation curve and lactation cycle (period) 	
	Animal diseases and protection	Animal health <ul style="list-style-type: none"> The signs of poor health/sick animals (cattle, pigs and chickens) The methods of testing animal health The various methods of administering medicine to animals (cattle, pigs and chickens) Sustainable use of medication infectious, non-infectious and metabolic animal diseases Level of seriousness of animal disease(chronic, per-acute and acute) Animal diseases The main micro-organisms causing diseases in animals The most important diseases found in South Africa based on the mode of transmission, animal host, symptoms and treatment: <ul style="list-style-type: none"> - Viral diseases <ul style="list-style-type: none"> o Foot-and-mouth disease (FmD), rabies, Rift valley fever (RVF), avian/bird flu, swine fever/flu and Newcastle disease (NCD) - Bacterial diseases <ul style="list-style-type: none"> o Anthrax, mastitis and tuberculosis (TB) - Protozoan diseases <ul style="list-style-type: none"> o Anaplasmosis, redwater, heartwater and coccidiosis - Fungal diseases <ul style="list-style-type: none"> o Lumpy wool and ringworm The economic implications of animal diseases The preventative/control measures for animal diseases 	

Topic	Subtopic	Content	Examples (including but not limited to)
Animal Sciences continued	Internal parasites/endoparasites	Internal parasites/endoparasites <ul style="list-style-type: none"> • <i>The concept:</i> internal parasite • The main groups of internal parasites • The most important internal parasites (based on their life cycles, animal hosts, symptoms and treatment): <ul style="list-style-type: none"> - Tapeworms; - Liver fluke; and - Roundworms. • The financial implications and detrimental effect of internal parasites • The preventative/control measures of internal parasites 	
	External parasites/ectoparasites	External parasites/ectoparasites <ul style="list-style-type: none"> • <i>The concept:</i> external parasite • The types of external parasites • The most important external parasites: <ul style="list-style-type: none"> - Ticks (the life cycle of single/two/three host ticks); - Nasal worm (sheep); and - Blowflies, lice and mites (sheep). • The financial implications and detrimental effect of external parasites • The preventative/control measures of external parasites 	
	Animal production legislation	<ul style="list-style-type: none"> • The basic principles of good health to control animal diseases and parasites/pests • The role of the state in animal protection 	
Agricultural Economics	Production factors	Land <ul style="list-style-type: none"> • The functions of land (in economic terms) • The economic characteristics of land as a production factor • The techniques/methods of increasing land productivity. Labour <ul style="list-style-type: none"> • The term labour • The different types of labour in agriculture (with relevant examples) • The problems associated with labour in agriculture • The methods of increasing labour productivity • Labour legislation Acts affecting farm workers in South Africa • The standard format and layout (components) of a labour/farm worker contract Capital <ul style="list-style-type: none"> • <i>Terminology:</i> capital, assets, cash flow, budgets • The types of capital (with relevant examples) • The methods of creating capital • The sources of finance/credit (long-term, medium-term and short-term credit) • The problems associated with capital as a production factor 	

		<ul style="list-style-type: none"> • <i>The capital/financial management systems:</i> financial records, farm asset records and farm budgets • The differences between an enterprise budget and a whole farm budget (example of farm budget) • The components of a cash flow statement • The main aspects which are included in a cash flow budget statement <p>Management</p> <ul style="list-style-type: none"> • <i>The concept:</i> farm management/management, strategic farm risk management • The principles/components of management • The general management skills needed to manage a farm business • The internal and external forces which affect/influence farming businesses • The primary sources of risk in farming business • The main risk management strategies/techniques (diversification strategies, risk sharing strategies) 	
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D. ADMINISTRATIVE DOCUMENTS AND APPENDICES**1. ADMINISTRATIVE DOCUMENTATION FOR SBA**

- 1.1 Cover Sheet for Teacher's File
- 1.2 Cover Sheet for Learner's File
- 1.3 Teacher's Record of SBA Marks
- 1.4 Rank Order List
- 1.5 National Moderation Tool
- 1.6 Final Moderation Feedback form to IEB
- 1.7 Example of Letter of Authenticity
- 1.8 Example of Declaration of Omissions

2. APPENDICES

- 2.1 Appendix A: Example of Design Grid

1.1 TEACHER'S SBA COVER SHEET



**NATIONAL SENIOR CERTIFICATE EXAMINATION
AGRICULTURAL SCIENCES
COVER SHEET FOR TEACHER'S FILE**

School:
Teacher's Name:

SUPPORTING DOCUMENTATION		Evidence provided
1	IEB Moderation Selection List (where Learner Files have been requested)	
2	Teacher's Record of SBA Marks	
3	Rank Order List for ALL Learners in the grade	
4	Evidence of School (or External if one person department) Moderation	

EVIDENCE OF SBA ITEMS	
This Section must contain:	
<ul style="list-style-type: none"> • All assessments done by learners. If learners have been allowed to select their best evidence, the full range of assessments done by all learners must be provided. • Design grids exams and tests • Marking Guidelines for each assessment (Memoranda, Rubrics etc.) 	

Preliminary Examination that includes Papers I, II and III	
Controlled Test 1	
Controlled Test 2	
Controlled Writing Piece	
Oral Task	
Visual Task	

1.2 CANDIDATE'S SBA COVER SHEET



NATIONAL SENIOR CERTIFICATE EXAMINATION
AGRICULTURAL SCIENCES
COVER SHEET FOR LEARNER'S FILE

(To be filled in by the candidate and controlled by the teacher)

Centre Number

Candidate's Examination number

		Topic/Heading	Date	Raw Score	Weighted Mark
Preliminary Examination		Paper I			
		Total		/300	/25
Controlled Test 1					/15
Controlled Test 2					/15
Controlled Writing Piece					/15
Oral Task					/15
Visual Task					/15
				TOTAL out of 100	

1.4 SBA RANK ORDER SHEET



**NATIONAL SENIOR CERTIFICATE EXAMINATION
AGRICULTURAL SCIENCES
SBA RANK ORDER LIST**

CENTRE NO

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CANDIDATES LISTED IN RANK ORDER OF MARKS (HIGHEST TO LOWEST)

	EXAMINATION NUMBER										MARK – 100
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
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22											
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24											
25											



**NATIONAL SENIOR CERTIFICATE EXAMINATION
AGRICULTURAL SCIENCES
NATIONAL MODERATION TOOL**



SCHOOL	DATE
TEACHER'S NAME	CENTRE NO:
MODERATOR	

Compliance	Completed Teacher's SBA Cover Sheet included	IEB Selection List included (if applicable)	Mark Schedule completed correctly and signed by the Principal	Completed Rank Order List included	Proof of School/External Moderation provided	Irregularities clearly documented
	This row applies to Learner's SBA only	Suitable file used	Completed and correct Learner's SBA Cover Sheet included	Declaration of Authenticity provided	Declaration of Omissions provided	

Rating Scale									
1. Does not meet the requirements at all. 2. Some important omissions. 3. Some minor omissions. 4. Meets the requirements fully.									
Quality	Evidence of ...	Clear instructions/ question papers provided	Task of required rigour	Completed Grid to justify design	Appropriate and clear Marking Guidelines	Consistent assessment against marking guidelines	Constructive feedback to learners	Comments with regards to compliance with SAGs	
	Preliminary Examination								
	Controlled Test 1								
	Controlled Test 2								
	Controlled Writing Piece								
	Oral Task								
	Visual Task								

Moderator's Signature: _____ **Date:** _____



**NATIONAL SENIOR CERTIFICATE EXAMINATION
AGRICULTURAL SCIENCES
FINAL MODERATION FEEDBACK FORM
To be completed and retained by the IEB**

Examination Centre Number: _____

Date: _____

The candidates required to submit Learner Files for moderation (candidates supplied by IEB)

Examination number	School Mark (%)	Moderated Mark (%)

Comments:

Recommendations:

SBA MARKS SHOULD BE ACCEPTED WITHOUT ALTERATION	<i>Yes</i>	<i>No</i>
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Change recommended by moderator:

Change to be implemented:

SBA Moderator's signature _____ Date: _____

1.7 LETTER OF AUTHENTICITY



**NATIONAL SENIOR CERTIFICATE EXAMINATION
AGRICULTURAL SCIENCES
LETTER OF AUTHENTICITY**

School Letterhead

DECLARATION BY THE CANDIDATE

I hereby declare that all the work contained in this SBA is my own, original work and that if I have made use of any source, I have acknowledged this.

 LEARNER NAME

 DATE

I agree that, if it is determined by the competent authorities that I have engaged in any fraudulent activities whatsoever in connection with the contents of my SBA, I shall forfeit completely the marks gained for this assessment.

 LEARNER NAME

 DATE
DECLARATION BY THE CANDIDATE'S TEACHER

As far as I know, the above statement by the candidate is true and I accept that the work offered is his/hers.

 TEACHER

 DATE

1.8 DECLARATION OF OMISSIONS



**NATIONAL SENIOR CERTIFICATE EXAMINATION
AGRICULTURAL SCIENCES
DECLARATION OF OMISSIONS**

To be included in place of a missing SBA piece

SCHOOL LETTERHEAD

**AGRICULTURAL SCIENCES
SBA OMISSIONS**

Learner Name: _____ **Grade:** _____

SBA Task: _____

The learner has failed to include the set SBA task for the following reason:

	Illness. <i>Doctor's note attached.</i>
	The completed task is lost, but a mark is recorded.
	Absenteeism. <i>I hereby acknowledge the fact that I have failed to report on an alternate date to complete my Agricultural Sciences SBA Task. This means I will receive 0% for the task. I am completely to blame for my own failure to complete the task on time or not at all.</i>
	Failed to hand in the task. <i>I hereby acknowledge the fact that I have failed to hand in an Agricultural Sciences SBA Task. This means I will receive 0% for the task. I am completely to blame for my own failure to hand in the task on time or not at all.</i>
	Other:

The learner will have the following assessment reflected on the mark sheet for the task

Teacher's Signature

DATE

Learner's Signature

DATE

