

2023/24 ANNUAL TEACHING PLANS: TECHNOLOGY: GRADE 9 (TERM 1)

TERM 1	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5
CAPS TOPIC	REVISION	DESIGN SKILLS	DESIGN SKILLS	INVESTIGATION SKILLS	DESIGN & EVALUATE SKILLS
CORE CONCEPTS, SKILLS AND VALUES	Baseline assessment	Flight of stairs and wheelchair ramp: Design brief specifying number of steps, height of stair risers, width and gradient of ramp, handrail, etc. <ul style="list-style-type: none"> • Line types: Dark, feint, dashed, wavy, chain. Scale and dimensions • First angle orthographic projection: Three-dimensional objects on flat paper • Concept of drawing three different views: Front, top and side. Simple cubes 	<ul style="list-style-type: none"> • Draw a plan for the stair and ramp using first angle orthographic projection to an appropriate scale, using correct views, line types and dimensions according to convention • More complex 3D objects drawn in orthographic projection with instruments 	Introduce the problem scenario for the Practical Assessment Task (PAT) through Investigate, Design, Evaluate, Communicate and Make (IDMEC) Investigate: Provide the scenario so that learners can investigate the problem situation and various possible structures which could solve the problem(s) they identify. Analysis of existing products relevant to the identified problem in terms of fitness-for-purpose (including suitability of materials), safety for users, costs of materials and costs of construction. Realistic costs of real materials, labour, transport, etc. Textbook writers must supply useful resources for this	<ul style="list-style-type: none"> • Design brief: Learners write a design brief with specifications for the final idea • Sketch initial ideas: Each learner generates two possible ideas • Evaluate and adapt: Groups evaluate individual ideas and develop the idea further • Groups, with guidance from the teacher, collaborate to produce an evaluation instrument • Groups use the instrument to evaluate their solution and others
REQUISITE PRE-KNOWLEDGE	Gr 8 knowledge and skills	Graphic communication	Graphic communication	Investigation skills	Design & evaluation skills
RESOURCES (OTHER THAN TEXTBOOK) TO ENHANCE LEARNING	Exemplar baseline assessment activities	DBE Sasol Inzalo workbooks/textbooks and any applicable resource whether YouTube videos, etc.	DBE Sasol Inzalo workbooks/textbooks and any applicable resource whether YouTube videos, etc.	DBE Sasol Inzalo workbooks/textbooks and any applicable resource whether YouTube videos, etc.	DBE Sasol Inzalo workbooks/textbooks and any applicable resource whether YouTube videos, etc.
INFORMAL ASSESSMENT	Baseline assessment	Informal assessment	Informal assessment		Informal assessment
SBA (FORMAL ASSESSMENT)				PAT 1 FORMAL ASSESSMENT: INVESTIGATE	PAT 1 FORMAL ASSESSMENT: DESIGN

TERM 1	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10
CAPS TOPIC	MAKING SKILLS & STRUCTURES	MAKING SKILLS & STRUCTURES	MAKING SKILLS	BUDGETING	COMMUNICATION SKILLS
CORE CONCEPTS, SKILLS AND VALUES	<p>Working drawings: Each learner draws the plan (or an aspect of the plan) using first angle orthographic projection with suitable scale, correct line types and dimensions</p> <ul style="list-style-type: none"> • Flow chart: Teams discuss how to proceed, then each learner draws a flow chart • Forces can be static or dynamic, and loads can be even or uneven • Strength of materials under the action of forces – metal cross-sections <ul style="list-style-type: none"> - Tension (pulling),, compression (pushing),, bending of beams (compression and tension) - Torsion – using internal cross-bracing to resist twisting 	<p>Properties of various construction materials Mass/density, hardness, stiffness, flexibility, corrosion resistance and prevention of corrosion</p> <p>Make the model of a viable solution It must be built neatly to scale, showing intelligent use of materials (group work)</p> <ul style="list-style-type: none"> • Learners must use safe working practices 	<p>Completion of the model of a viable solution: It must be built neatly to scale, showing intelligent use of materials (group work)</p> <p>Learners must use safe working practices</p>	<p>Budgeting</p> <ul style="list-style-type: none"> • Practical exercise on budgeting • Costing of the “real-life” solution, including correct materials and labour costs (ramp and staircase) 	<p>Team presentations Teams present their tender bid to the “tender board” Each team member must be responsible for an aspect of the presentation Tenders consist of sketches, plans, budget and model</p>
REQUISITE PRE-KNOWLEDGE	Structures	Properties of material & making skills	Graphic communication	Budgeting skills	Presenting skills
RESOURCES (OTHER THAN TEXTBOOK) TO ENHANCE LEARNING	DBE Sasol Inzalo workbooks/textbooks and any applicable resource whether YouTube videos, etc.	DBE Sasol Inzalo workbooks/textbooks and any applicable resource whether YouTube videos, etc.	DBE Sasol Inzalo workbooks/textbooks and any applicable resource whether YouTube videos, etc.	DBE Sasol Inzalo workbooks/textbooks and any applicable resource whether YouTube videos, etc.	DBE Sasol Inzalo workbooks/textbooks and any applicable resource whether YouTube videos, etc.
INFORMAL ASSESSMENT	Informal assessment			Informal assessment	Informal assessment
SBA (FORMAL ASSESSMENT)	PAT 1 FORMAL ASSESSMENT: DESIGN & MAKE	PAT 1 FORMAL ASSESSMENT: MAKE	PAT 1 FORMAL ASSESSMENT: MAKE		PAT 1 INVESTIGATE – WEEK 4, 15 MARKS DESIGN – WEEK 5/6, 20 MARKS MAKE – WEEK 7/8, 35 MARKS TOTAL: 70 MARKS

TERM 1	WEEK 11				
CAPS TOPIC	CONSOLIDATION				
CORE CONCEPTS, SKILLS AND VALUES	Consolidation of work done in term 1				
REQUISITE PRE-KNOWLEDGE	Graphic communication & structures				
RESOURCES (OTHER THAN TEXTBOOK) TO ENHANCE LEARNING	DBE Sasol Inzalo workbooks/textbooks and any applicable resource YouTube videos, etc.				
INFORMAL ASSESSMENT	Informal				

2023/24 ANNUAL TEACHING PLANS: TECHNOLOGY: GRADE 9 (TERM 2)

TERM 2	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5
CAPS TOPIC	MECHANICAL SYSTEMS AND CONTROL INVESTIGATION SKILLS	MECHANICAL SYSTEMS AND CONTROL INVESTIGATION SKILLS	MECHANICAL SYSTEMS AND CONTROL INVESTIGATION SKILLS	MECHANICAL SYSTEMS AND CONTROL INVESTIGATION SKILLS	MECHANICAL SYSTEMS AND CONTROL INVESTIGATION SKILLS
CORE CONCEPTS, SKILLS AND VALUES	<ul style="list-style-type: none"> • Revise: Syringe mechanics using two equal sized syringes linked by a tube • Force transfer between the syringes filled with: <ul style="list-style-type: none"> - Compressed air – pneumatic system - Water – hydraulic system • Action research: Learners experiment /teacher demonstrates with two different sizes of syringes linked by a tub and filled with hydraulic fluid (water), learners experience force transfer with either force multiplication or force division • Gases (like air) are compressible, liquids (like water, oils) are incompressible 	<ul style="list-style-type: none"> • Pascal's principle – pressure exerted on one part of a hydraulic system will be transferred equally, without any loss, in all directions to other parts of the system • Note that equal volumes of liquid are moved through the systems, and this results in different extensions (amount of movement) where syringes (cylinders) are of different sizes, so less distance/more force ($MA > 1$), and more distance /less force ($MA < 1$). (why is this part left out?) 	<p>The hydraulic press (including simple calculations)</p> <ul style="list-style-type: none"> • The hydraulic jack <p>Investigation: Design considerations fit-for-purpose:</p> <ul style="list-style-type: none"> • Evaluate the design of the hydraulic jack in terms of: <ul style="list-style-type: none"> - Who is it for? What is it for? Will it do the job? What should it be made of? What should it cost? Is it cost-effective? Does it look good (aesthetics)? Is it safe/easy to use for the end user (ergonomics)? <p>- Draw a systems diagram that describes how a hydraulic jack function</p>	<p>Action research: Practical investigations:</p> <ul style="list-style-type: none"> • Use a single wheel fixed pulley to change the direction of pull ($MA = 1$) • Use a single wheel moveable pulley to change the direction of pull ($MA > 0$) • Use a pulley block system (block and tackle) to determine the relationship between loadbearing ropes on moveable pulley wheels and M.A (force multiplication) 	<p>Investigate: Learners find out about the following mechanical control systems:</p> <ul style="list-style-type: none"> • Ratchet and pawl • Disc brake • Bicycle brake • Cleat
REQUISITE PRE-KNOWLEDGE	Mechanical systems and control	Mechanical systems and control	Mechanical systems and control	Mechanical systems and control	Mechanical systems and control
RESOURCES (OTHER THAN TEXTBOOK) TO ENHANCE LEARNING	Siyavula workbook/textbooks and or any other relevant resources	Siyavula workbook/textbooks and or any other relevant resources	Siyavula workbook/textbooks and or any other relevant resources	Siyavula workbook/textbooks and or any other relevant resources	Siyavula workbook/textbooks and or any other relevant resources
INFORMAL ASSESSMENT	Informal assessment	Informal assessment	Informal assessment	Informal assessment	Informal assessment
SBA (FORMAL ASSESSMENT)					

TERM 2	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10
CAPS TOPIC	MECHANICAL SYSTEMS AND CONTROL INVESTIGATION SKILLS	INVESTIGATION & DESIGN SKILLS	MAKING SKILLS	CONSOLIDATION AND REVISION OF CONCEPTS/TOPICS	CONSOLIDATION AND REVISION OF CONCEPTS/TOPICS
CORE CONCEPTS, SKILLS AND VALUES	<p>Lead learners as they revise the interactions of the following:</p> <ul style="list-style-type: none"> • Spur gears of equal size counter-rotating • Spur gears of unequal size counter-rotating – note velocity/force relationships • Spur gears using an idler to synchronise rotation <p>Lead learners as they find out about the interactions of the following:</p> <ul style="list-style-type: none"> • Bevel gears of equal size – axis of rotation 90° • Bevel gears of unequal size – axis of rotation 90° – note velocity/force relationships • Rack-and-pinion gear system as found on automatic gates and steering racks • Worm gear system for large reduction in speed and increase in force 	<ul style="list-style-type: none"> • Investigate the situation so that an appropriate machine can be designed to solve the problem, need or want given in the scenario. Investigate the possible mechanisms and controls to be used together to make the machine • The design brief: Each learner writes his/her suggestion for the design giving specifications and constraints • Sketches: Each learner produces two sketches of viable possible designs. And then decide on a final solution 	<p>Plan: Working drawings</p> <ul style="list-style-type: none"> • Learners produce drawings for their model/prototype using first angle orthographic projection • Each learner draws a plan of the design OR, if it is very complex, one or more aspects of the design <p>Each learner must demonstrate her/his competency in using this drawing technique</p>	<ul style="list-style-type: none"> • Compressed air – pneumatic system • Hydraulic system • Pascal's principle • The hydraulic press (including simple calculations) 	<ul style="list-style-type: none"> • Pulleys • Mechanical control systems • Gear systems
REQUISITE PRE-KNOWLEDGE	Mechanical systems and control graphic communication skills	Investigation skills Design skills	Investigation skills Design skills	Mechanical systems and control	Mechanical systems and control
RESOURCES (OTHER THAN TEXTBOOK) TO ENHANCE LEARNING	DBE Sasol Inzalo workbooks/Textbooks and any applicable resource YouTube videos etc.	DBE Sasol Inzalo workbooks/Textbooks and any applicable resource YouTube videos etc.	DBE Sasol Inzalo workbooks/Textbooks and any applicable resource YouTube videos etc.	DBE Sasol Inzalo workbooks/Textbooks and any applicable resource YouTube videos etc.	DBE Sasol Inzalo workbooks/textbooks and any applicable resource YouTube videos etc.
INFORMAL ASSESSMENT	Informal assessment	Informal assessment	Informal assessment		
SBA (FORMAL ASSESSMENT)				MID-YEAR EXAMINATION: 40 MARKS	

TERM 2	WEEK 11				
CAPS TOPIC	CONSOLIDATION AND REVISION OF CONCEPTS/TOPICS				
CORE CONCEPTS, SKILLS AND VALUES	<ul style="list-style-type: none"> • Pulleys • Mechanical control systems • Gear systems 				
REQUISITE PRE-KNOWLEDGE	Mechanical systems and control				
RESOURCES (OTHER THAN TEXTBOOK) TO ENHANCE LEARNING	DBE Sasol Inzalo workbooks/textbooks and any applicable resource YouTube videos etc.				
SBA (FORMAL ASSESSMENT)	FORMAL ASSESSMENT: TEST				

2023/24 ANNUAL TEACHING PLANS: TECHNOLOGY: GRADE 9 (TERM 3)

TERM 3	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5
CAPS TOPIC	ELECTRICAL SYSTEMS & CONTROL INVESTIGATION SKILLS	ELECTRICAL SYSTEMS & CONTROL INVESTIGATION SKILLS	ELECTRICAL SYSTEMS & CONTROL DESIGN SKILLS	ELECTRICAL SYSTEMS & CONTROL INVESTIGATION SKILLS	ELECTRONIC SYSTEMS & CONTROL
CORE CONCEPTS, SKILLS AND VALUES	<p>Investigate the situation and the nature of the need so that an appropriate circuit can be chosen to solve the problem, need or want given in the scenario</p> <p>A given circuit must be incorporated into the design of a device that will use the electronics to address the problem, need or want</p> <p>Revise 1 – component symbols</p> <ul style="list-style-type: none"> • Cells in series and parallel • Lamps in series and parallel • Switches in series (AND logic) and parallel (OR logic) • Current in the circuit – conventional current flows from positive to negative 	<p>Revise 2 – simple circuits</p> <ul style="list-style-type: none"> • One cell, switch, two lamps in series • Two cells in series, switch, two lamps in series <p>Diodes and LED (Light Emitting Diode):</p> <p>A diode is a component that allows current to flow in one direction only.</p> <p>A LED allows current to flow in one direction only and also gives off light and is often used as an indicator that a circuit is 'ON'. Resistor colour codes:</p> <ul style="list-style-type: none"> • Low value resistors often have their resistance value printed on them in numbers • Higher value resistors are coded using coloured bands. The first three bands give the value of the resistor in ohms. The fourth band is an accuracy rating as a percentage 	<p>The design brief: Each learner writes his/her suggestion for the design giving specifications and constraints</p> <p>Sketches: Each learner draws the circuit diagram. Each learner produces a sketch in 3D showing the device that will use the electronic circuit</p> <p>Teams meet and examine the individual suggestions and then decide on a final solution</p>	<p>Ohm's law quantitatively: <i>as voltage increases, current increases if resistance is constant.</i> Action research: testing Ohm's Law practically – measure the voltage (potential difference) and the current strength in each of the following circuits:</p> <ul style="list-style-type: none"> • One cell connected to a resistor – note the voltmeter and ammeter readings • Two cells connected to the resistor – note the voltmeter and ammeter readings • Three cells connected to the resistor – note the voltmeter and ammeter readings (Use the same resistor for both activities) <p>Plot the readings on a graph and determine the relationship between potential difference and current strength while keeping the resistance constant</p>	<p>Calculate values</p> <div style="border: 1px solid black; padding: 5px;"> <p>Calculate values:</p> $R = \frac{V}{I} \quad \text{use to calculate R if V and I are known.}$ $V = IR \quad \text{use to calculate V if I and R are known.}$ $I = \frac{V}{R} \quad \text{use to calculate I if V and R are known.}$ </div> <p>Note</p> <p>R - represents the resistance of a resistor in ohms [Ω]</p> <p>V - represents the potential difference in volts [V]</p> <p>I - represents the current strength in amperes [A]</p> <p>Switches: Manual switches controlled by the user, e.g. Push SPST, SPDT, DPDT</p>
REQUISITE PRE-KNOWLEDGE	Simple circuit & component symbols Input devices, control devices and output devices	Ohm's law qualitatively Alternating current	Resistors as output devices	Electrical circuit diagrams	Electrical circuit diagrams
RESOURCES (OTHER THAN TEXTBOOK) TO ENHANCE LEARNING	DBE Sasol Inzalo workbooks/textbooks and any applicable resource YouTube videos, etc.	DBE Sasol Inzalo workbooks/textbooks and any applicable resource YouTube videos, etc.	DBE Sasol Inzalo workbooks/textbooks and any applicable resource YouTube videos, etc.	DBE Sasol Inzalo workbooks/textbooks and any applicable resource YouTube videos, etc.	DBE Sasol Inzalo workbooks/textbooks and any applicable resource, etc.
INFORMAL ASSESSMENT		Informal assessment		Informal assessment	Informal assessment
SBA (FORMAL ASSESSMENT)	PAT 2 FORMAL ASSESSMENT: INVESTIGATE		PAT 2 FORMAL ASSESSMENT: DESIGN		

TERM 3	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10
CAPS TOPIC	ELECTRONIC SYSTEMS & CONTROL	ELECTRONIC SYSTEMS & CONTROL	DESIGN SKILLS	MAKING SKILLS	COMMUNICATION SKILLS
CORE CONCEPTS, SKILLS AND VALUES	<p>Transistors: Only npn-type will be used at this level. A transistor is a device that can act as a switch and it can amplify a small current</p> <p>Sensors – Important input devices:</p> <ul style="list-style-type: none"> • LDR (Light Dependent Resistor) – a component whose resistance decreases with light [dark: High resistance, bright light:Low resistance]. with light [dark high resistance, bright light – low resistance] • Thermistor: A component whose resistance varies with temperature. Two types exist: <ul style="list-style-type: none"> -- + t: Resistance increases with increasing temperature -- - t: Resistance decreases with increasing temperature. • Touch or moisture detector: A component that can be bridged using a “wet” finger, thus completing the circuit, indicating the touch • Capacitors: A component which can store and then release electrical energy 	<p>Simple electronic circuits Learners draw, these simple electronic circuits:</p> <ul style="list-style-type: none"> • LED, 470Ω resistor, switch, and 4,5V series battery • LDR, buzzer, 3V series battery • NPN transistor, buzzer or bell, thermistor, variable resistor, 1kΩ resistor, 6V series battery, LED, 470Ω resistor, 1 000μF capacitor, switch 	<ul style="list-style-type: none"> •The learners produce plans for their device/modell/prototype using a 3D “assembly” drawing in exploded view showing how the model fits together 	<p>Complete making of the prototype/working model Learners use safe working practices Building: The model must showcase a viable solution to the problem. It should be to scale and neat, and show intelligent use of available materials Building: The model must showcase a viable solution to the problem. It should be to scale and neat, and show intelligent use of available materials</p>	<p>Team presentations (team)</p> <ul style="list-style-type: none"> • Each team is given five minutes to present their solution in the form of sketches, artistic impressions of the solution, working/plans, costing and their model • Each learner compiles a record of his/her own individual contribution to the task. It should be reflected in each learner’s workbook
REQUISITE PRE-KNOWLEDGE	Electrical circuit diagrams	Electrical circuit diagrams	Graphic communication, design and making skills	Making skills	Presenting skills
RESOURCES (OTHER THAN TEXTBOOK) TO ENHANCE LEARNING	DBE Sasol Inzalo workbooks/textbooks and any applicable resource YouTube videos, etc.	DBE Sasol Inzalo workbooks/textbooks and any applicable resource, etc.	DBE Sasol Inzalo workbooks/textbooks and any applicable resource, etc.	Siyavula workbook/textbooks Applicable resources	Siyavula workbook/Textbooks Applicable resources
INFORMAL ASSESSMENT	Informal assessment	Informal assessment	Informal assessment		Informal assessment
SBA (FORMAL ASSESSMENT)			PAT 2 FORMAL ASSESSMENT: DESIGN	PAT 2 FORMAL ASSESSMENT: MAKE	PAT 2 INVESTIGATE – WEEK 1, 15 MARKS DESIGN – WEEK 3/8, 20 MARKS MAKE – WEEK 9, 35 MARKS TOTAL: 70 MARKS

TERM 3	WEEK 11				
CAPS TOPIC	Consolidation/revision				
CORE CONCEPTS, SKILLS AND VALUES	Consolidation/revision				
REQUISITE PRE-KNOWLEDGE	Mechanical systems and control				
RESOURCES (OTHER THAN TEXTBOOK) TO ENHANCE LEARNING	DBE Sasol Inzalo workbooks/textbooks and any applicable resource YouTube videos, etc.				
INFORMAL ASSESSMENT	Informal assessment				
SBA (FORMAL ASSESSMENT)					

2023/24 ANNUAL TEACHING PLANS: TECHNOLOGY: GRADE 9 (TERM 4)

TERM 4	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5
CAPS TOPIC	PROCESSING: INDIGENOUS TECHNOLOGY	PROCESSING INVESTIGATION & DESIGN SKILLS	PROCESSING INVESTIGATION & DESIGN SKILLS	PROCESSING DESIGN SKILLS	DESIGN SKILLS
CORE CONCEPTS, SKILLS AND VALUES	PRESERVING METALS First two methods theoretically <ul style="list-style-type: none"> • Painting • Galvanising • Electroplating Practical investigation: Preserving metals by electroplating	PRESERVING FOOD First two methods theoretically <ul style="list-style-type: none"> • Storing grain • Pickling • Drying and/or salting Practical investigation: Preserving metals by drying and salting NB: The drying/salting process will take time and be evaluated when completed	TYPES OF PLASTICS AND THEIR USES <ul style="list-style-type: none"> • Investigation: Identification of plastic, identifying codes and sorting for recycling • Properties of plastics • Reduce – reuse – recycle 	CASE STUDY: Remanufacturing waste plastic into pellets for re-use Systems diagram: Draw a systems diagram describing a plastics recycling project Case study: Moulding recycled plastic pellets into products Problem identification: Learners identify a need or want that can be satisfied by the making of a plastic item of their own design	<ul style="list-style-type: none"> • Case study: Plastics used on modern motor cars • Case study: Plastics used around the home
REQUISITE PRE-KNOWLEDGE	Preserving of materials	Preserving of materials	Re-using materials for making products during the design processes encountered in previous grades	Re-using materials for making products during the design processes encountered in previous grades	Re-using materials for making products during the design processes encountered in previous grades
RESOURCES (OTHER THAN TEXTBOOK) TO ENHANCE LEARNING	Siyavula workbook/textbooks Applicable resources	Siyavula workbook/textbooks Applicable resources	Siyavula workbook/textbooks Applicable resources	DBE Sasol Inzalo workbooks/textbooks and any applicable resource YouTube videos, etc.	DBE Sasol Inzalo workbooks/textbooks and any applicable resource YouTube videos, etc
INFORMAL ASSESSMENT	Informal assessment	Informal assessment	Informal assessment	Informal assessment	Informal assessment

TERM 4	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10
CAPS TOPIC	DESIGN SKILLS	CONSOLIDATION/REVISION	CONSOLIDATION/REVISION	FORMAL TEST	FORMAL TEST
CORE CONCEPTS, SKILLS AND VALUES	Plan: Learners draw their plastic item using first angle orthographic projection	Content of term 3 and 4	Content of term 3 and 4	End-of-year examination	End-of-year Examination
REQUISITE PRE-KNOWLEDGE	Drawing skills				
RESOURCES (OTHER THAN TEXTBOOK) TO ENHANCE LEARNING	DBE Sasol Inzalo workbooks/textbooks and any applicable resource YouTube videos, etc.	Siyavula workbook/textbooks and or any other relevant resources	Siyavula workbook/textbooks and or any other relevant resources	Question paper	Question paper
INFORMAL ASSESSMENT	Informal assessment	Informal assessment			
SBA (FORMAL ASSESSMENT)			END-OF-YEAR EXAMINATION: 40 MARKS		