

2023/24 ANNUAL TEACHING PLANS: TECHNICAL MATHEMATICS: GRADE 12 (TERM 1)

TERM 1	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10	WEEK 11
DATE COMPLETED											
<b>CAPS TOPICS</b>	<b>COMPLEX NUMBERS</b>		<b>ANALYTICAL GEOMETRY</b>		<b>POLYNOMIALS</b>	<b>DIFFERENTIAL CALCULUS</b>					<b>CONSOLIDATION AND ASSESSMENT</b>
<b>TOPICS/CONCEPTS, SKILLS AND VALUES</b>	1. Define a complex number, $\mathbb{C}$ , $z = a + bi$ 2. Simplify by add, subtract, divide, multiply and simplify imaginary numbers and complex numbers 3. Represent complex numbers in the Argand diagram, 4. Argument of $z$ 5. Trigonometric (polar) & rectangular form of complex numbers 6. Solve equations involving complex numbers with two variables		Use a two-dimensional Cartesian co-ordinate system to determine: • The equation of a circle, $x^2 + y^2 = r^2$ , with radius $r$ and centre at the origin $(0;0)$ • The equation of a tangent to a circle at a given point on the circle • The equation of a circle of a tangent and a given circle • Point/s of intersection of a circle and a straight line. • Plotting of the graph of ellipse in the form $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$		1. Revise the function notation and define polynomials in one variable 2. Revise factorising of quadratic polynomials 3. Define the Remainder theorem and apply it where a third-degree polynomial is divided by a linear binomial 4. Define the Factor theorem and apply it where a third-degree polynomial is divided by a linear binomial 5. Factorise third degree polynomials (No proofs are required. Long division method can also be use)	1. An intuitive understanding of the limit concept, in the context of approximating the rate of change or gradient of a function at a point. 2. Determine the average gradient of a curve between two points. $m = \frac{f(x+h) - f(x)}{h}$ 3. Determine the gradient of a tangent to a graph, which is also the gradient of the graph at that point. Introduce the limit-principle by shifting the secant until it becomes a tangent 4. By using first principle: $f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$ for <ul style="list-style-type: none"> <li>• <math>f(x) = k</math></li> <li>• <math>f(x) = ax</math></li> <li>• <math>f(x) = ax + b</math></li> </ul> 5. Use the rule $\frac{d}{dx}(ax^n) = anx^{n-1}$ for $n \in \mathbb{R}$ 6. Find equations of tangents to graphs of functions 7. Sketch graphs of cubic polynomial functions using differentiation to determine the co-ordinate of stationary points. Also, determine the $x$ - intercepts of the graph using the factor theorem and other techniques 8. Solve practical problems concerning optimization and rates of change, including calculus of motion					
<b>SBA</b>	<b>PAT 1 &amp; TEST</b>										

2023/24 ANNUAL TEACHING PLANS: TECHNICAL MATHEMATICS: GRADE 12 (TERM 2)

TERM 2	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10	WEEK 11
DATE COMPLETED											
<b>CAPS TOPICS</b>	<b>INTEGRATION</b>			<b>TRIGONOMETRY</b>			<b>EUCLIDEAN GEOMETRY</b>				<b>CONSOLIDATION</b>
<b>TOPICS /CONCEPTS, SKILLS AND VALUES</b>	1. Understand the basic concept. 2. Apply standard forms of integrals as a converse of differentiation 3. Integrate the following functions: <ul style="list-style-type: none"> <li>• <math>kx^n</math></li> <li>• <math>\frac{k}{x}</math></li> <li>• <math>ka^{nx}</math></li> </ul> 4. Integrate polynomials 5. Applying integration to determine the magnitude of an area included by: <ul style="list-style-type: none"> <li>• a curve and the x-axis</li> <li>• curve by a curve</li> <li>• the x-axis and the ordinates <math>x = a</math> and <math>x = b</math>, where <math>a, b \in Z</math></li> </ul>			1. Revision of Gr. 11 Trigonometry 2. Revise the basic trigonometric ratios and apply them to solve right angled triangles 3. Sine, Cosine and Area rules 4. Solving problems in 2 dimensions <ul style="list-style-type: none"> <li>• Measurements must always be given for angles and lengths of sides</li> </ul>			1. Revision Gr. 11 Euclidean Geometry 2. Revise earlier work on the necessary and sufficient conditions for polygons to be similar and congruent 3. Introduce and apply the following theorems: <ul style="list-style-type: none"> <li>• That equiangular triangles are similar</li> <li>• That triangles with sides in proportion are similar</li> <li>• That a line drawn parallel to one side of a triangle divided the other two sided proportionally</li> </ul>				<b>NB: All topics taught in Gr. 10 &amp; 11 will be assessed in June Examination</b>
<b>PAT &amp; SBA</b>	<b>PAT 2 &amp; ASSIGNMENT &amp; JUNE EXAM</b>										

**2023/24 ANNUAL TEACHING PLANS: TECHNICAL MATHEMATICS: GRADE 12 (TERM 3)**

TERM 3	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10	WEEK 11
DATE COMPLETED											
<b>CAPS TOPICS</b>	<b>TRIGONOMETRY</b>		<b>CONSOLIDATION</b>				<b>TRIAL EXAMS</b>				
<b>TOPICS/CONCEPTS, SKILLS AND VALUES</b>	Solving problems in 2 and 3 dimensions • Measurements must always be given for angles and lengths of sides										
<b>PAT &amp; SBA</b>	<b>PAT 3 &amp; TEST &amp; TRIAL EXAM (PAPER 1 AND PAPER 2)</b>										

2023/24 ANNUAL TEACHING PLANS: TECHNICAL MATHEMATICS: GRADE 12 (TERM 4)

TERM 4	WEEK 1	WEEK 2	WEEK 3	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10	
DATE COMPLETED										
CAPS TOPICS	REVISION			FINAL EXAMS						
TOPICS/CONCEPTS, SKILLS AND VALUES										
SBA	FINAL EXAMINATION (PAPER 1 AND PAPER 2)									
EXAMINATION	PAPER 1				PAPER 2					
	TOPIC			MARKS	TOPIC			MARKS		
	Algebra (Number system, exponents logarithms, expressions, equations and inequalities including nature of roots)			50 ± 3	Analytical geometry			25 ± 3		
	Functions & graphs			35 ± 3	Trigonometry			50 ± 3		
	Finance, growth, and decay			15 ± 3	Euclidean geometry			40 ± 3		
	Differential calculus and Integration			50 ± 3	Mensuration and circles, angles, and angular movement			35 ± 3		
	<b>TOTAL</b>			<b>150</b>	<b>TOTAL</b>			<b>150</b>		