Varsity College
Year 12 Specialist Mathematics 2024

Term 1

Week	Date	Topics	Assessment
1	**22-26 January** O-Week Australia Day PH Fri	• O Week	
2	**29 Jan-2 Feb**	**Unit 3 Topic 2: Vectors and matrices** • Review of Cartesian form and polar form **Ch. 4A, 4C** • Introduction to 3D vectors **Ch. 4B** • Unit vectors in 3D space and the altitude angle **Ch. 4C**	
3	**5-9 February** Swimming Carnival - Thurs	• Scalar product and the angle between vectors **Ch. 4D** • Vector projections (2D vectors then **3D**) **Ch. 4E** Collinearity **Ch. 4F** • Geometric proofs using vectors in 3D **Ch. 4G**	
4	**12-16 February**	• Vector functions intro and conversion to Cartesian functions • Represent vectors in parametric vector and Cartesian form (including circles, ellipses and hyperbolas) • Collisions of particles (determine if paths cross or meet) **Ch. 5B**	
5	**19-23 February**	• Vector equations of lines **Ch. 5C** ○ Parallel and perpendicular vector equations **Ch. 5C** ○ Distance from a point and a line **Ch. 5C** • Intersection of lines **Ch. 5D** • Vector (cross) product **Ch. 5E** • Vector methods in applications - area of shapes	
6	**26 Feb-1 Mar** GC24 - Wednesday	• Vector equations of planes **Ch. 5F** • Distances, angles and intersections **Ch. 5G** • The Cartesian equation of a sphere **Ch. 5H**	
7	**4-8 March**	• Differentiate and integrate a vector function with respect to time (Vector Calculus) **Ch. 8C** • Determine position, velocity and acceleration vectors as a function of time **Ch. 8D** • Sketch vectors as a function of time in parametric form	
8	**11-15 March**	Apply vector calculus to motion in a plane, including: • Collisions of particles (determine if paths cross or meet) **Ch. 8D** • Projectile motion **Ch. 8F** • Circular motion **Ch. 8G**	
9	**18-22 March** GC24 - Thursday	Revision	
10	**25-29 March** Good Friday PH	**EXAM BLOCK**	**IA2 EXAM**
School holidays: Friday March 29 - Sunday April 14			

Term 2

Week	Date	Topics	Assessment
1	**15-19 April** Cross Country – Wed	**Unit 4 Topic 1: Integration and applications of integration** • Integration using substitution **Ch. 11D** • Integration of natural logarithm functions **Ch. 11A**	
2	**22-26 April** GC24 - Tuesday Anzac Day PH - Thurs	• Integration techniques using the trig. identities **Ch. 11F** • Derivatives of inverse trigonometric functions **Ch. 11B**	
3	**29 Apr-3 May**	• Integration techniques for inverse trigonometric functions **Ch. 11C** • Integration by parts **Ch. 11H** • Integration using partial fractions **Ch. 11G**	
4	**6-10 May** Labour Day PH - Mon	• Simpson's rule **Ch. 12F** • Area of a region between two curves **Ch. 12B** • Volumes of solids of revolution **Ch. 12D**	
5	**13-17 May**	• Volumes of solids of revolution (continued) **Ch. 12D** **Unit 4 Topic 2: Rates of change and differential equations** • Implicit differentiation, including equations of tangents and normal **Ch. 13A**	
6	**20-24 May**	• Related rates **13H & Ch. 13I** • First-order differential equations **Ch. 13B, 13C & 13D**	
7	**27-31 May**	• Separation of variables **Ch. 13G** • Applications of differential equations, including Newton's law of cooling, radioactive decay **Ch. 13E**	
8	**3-7 June**	• Applications of differential equations, including Newton's law of cooling, radioactive decay (continued) **Ch. 13E** • The logistic differential equation **Ch. 13F** • Slope field for a differential equation **Ch. 13K**	
9	**10-14 June** GC24 - Wednesday	**Unit 4 Topic 2: Rates of change and differential equations** • Displacement, velocity and acceleration **Ch. 14A** • Differential equations of velocity and acceleration **Ch. 14B & 14C**	
10	**17-21 June** Athletics Carnival - Thurs	• Simple harmonic motion **Ch. 14D** • Newton's laws of motion for constant force, momentum, resultant force, action and reaction **Ch. 14F**	
School holidays: Saturday June 22 - Sunday July 7			

Term 3

Week	Date	Topics	Assessment
1	8-12 July	• Inclined planes **Ch. 14G** • Connected particles **Ch. 14H** • Non-constant forces **Ch. 14I**	
2	15-19 July	**Unit 4 Topic 3: Statistical inference** • Probability density function **Ch. 15E** • Sample means and central limit theorem **Ch. 15D** Confidence intervals for the population mean **Ch. 15F**	
3	22-26 July GC24 - Thursday	**Revision for IA3 content**	
4	29 Jul- 2 Aug	**Revision and exam**	**IA3 Unit 4 Exam Friday L3 & 4**
5	5-9 August	**Review**: • Unit 3 Topic 1: Proof by induction • Unit 3 Topic 2: Vectors and matrices	
6	12-16 August GC24 Finals – Wed.	• Unit 3 Topic 3: Complex numbers 2	
7	19-23 August	• Unit 4 Topic 1: Integration and applications of integration	
8	26-30 August	• Unit 4 Topic 2: Rates of change and differential equations • Unit 4 Topic 3: Statistical inference	
9	2-6 September	**Mock Exams**	
10	9-13 September	**Mock Exams**	
School holidays: Saturday September 14 – Sunday September 29			

Term 4

Week	Date	Topics	Assessment
1	30 Sept – 4 Oct	• **REVISION UNIT 3 & 4**	
2	7-11 October King's B'day PH - Monday	• **REVISION UNIT 3 & 4**	
3	14-18 October	• No classes for Applied and Certificate subjects. • Study lessons for General subjects.	
4	21 - 25 October	**EXTERNAL EXAMS**	**External Assessment: Unit 3 and 4**
5	28 Oct – 1 Nov		
6	4-8 November		
7	11-15 November	**Final Week Events**	