

**Varsity College**  
**Year 12 Specialist Mathematics 2025**

**Term 1**

Week	Date	Topics	Assessment
1	27-31 January O-Week Australia Day: Monday	<ul style="list-style-type: none"> <li>• O Week</li> </ul>	
2	3-7 February	<b>Unit 3 Topic 1: Proof by mathematical induction</b> <ul style="list-style-type: none"> <li>• Revision of proof techniques</li> <li>• Nature of inductive proof</li> <li>• Proof by mathematical induction</li> </ul>	
3	10-14 February Swimming Carnival: Tuesday	<b>Unit 3 Topic 2: Vectors and matrices</b> <ul style="list-style-type: none"> <li>• Review of Cartesian form and polar form</li> <li>• Introduction to 3D vectors</li> <li>• Unit vectors in 3D space and the altitude angle</li> </ul>	
4	17-21 February	<ul style="list-style-type: none"> <li>• Scalar product and the angle between vectors</li> <li>• Vector projections (2D vectors then 3D)</li> <li>• Collinearity</li> <li>• Geometric proofs using vectors in 3D</li> </ul>	
5	24-28 February	<ul style="list-style-type: none"> <li>• Vector functions intro and conversion to Cartesian functions</li> <li>• Represent vectors in parametric vector and Cartesian form (including circles, ellipses and hyperbolas)</li> <li>• Collisions of particles (determine if paths cross or meet)</li> </ul>	
6	3-7 March GC25: Wednesday	<ul style="list-style-type: none"> <li>• Vector equations of lines               <ul style="list-style-type: none"> <li>○ Parallel and perpendicular vector equations</li> <li>○ Distance from a point and a line</li> </ul> </li> <li>• Intersection of lines</li> <li>• Vector (cross) product</li> <li>• Vector methods in applications - area of shapes</li> </ul>	
7	10-14 March	<ul style="list-style-type: none"> <li>• Vector equations of planes</li> <li>• Distances, angles and intersections</li> <li>• The Cartesian equation of a sphere</li> </ul>	
8	17-21 March	<ul style="list-style-type: none"> <li>• Differentiate and integrate a vector function with respect to time (Vector Calculus)</li> <li>• Determine position, velocity and acceleration vectors as a function of time</li> <li>• Sketch vectors as a function of time in parametric form</li> </ul>	
9	24-28 March	Apply vector calculus to motion in a plane, including: <ul style="list-style-type: none"> <li>• Collisions of particles (determine if paths cross or meet)</li> <li>• Revision</li> </ul>	
10	31 March - 4 April	<b>EXAM BLOCK</b>	<b>IA2 Exam</b>
<b>School holidays: Friday April 4 - Sunday April 19</b>			

## Term 2

Week	Date	Topics	Assessment
1	21-25 April Easter Monday ANZAC Day: Friday	<b>Unit 4 Topic 1: Integration and applications of integration</b> <ul style="list-style-type: none"> <li>Integration using substitution</li> <li>Integration of natural logarithm functions</li> </ul>	
2	28 April-2 May GC25: Tuesday	<ul style="list-style-type: none"> <li>Integration techniques using the trig. identities</li> <li>Derivatives of inverse trigonometric functions</li> </ul>	
3	5-9 May Labour Day: Monday	<ul style="list-style-type: none"> <li>Integration techniques for inverse trigonometric functions</li> <li>Integration by parts</li> <li>Integration using partial fractions</li> </ul>	
4	12-16 May	<ul style="list-style-type: none"> <li>Simpson's rule</li> <li>Area of a region between two curves</li> <li>Volumes of solids of revolution</li> </ul>	
5	19-23 May	<ul style="list-style-type: none"> <li>Volumes of solids of revolution (continued)</li> </ul> <b>Unit 4 Topic 2: Rates of change and differential equations</b> <ul style="list-style-type: none"> <li>Implicit differentiation, including equations of tangents and normal</li> </ul>	
6	26-30 May	<ul style="list-style-type: none"> <li>Related rates</li> <li>First-order differential equations</li> </ul>	
7	2-6 June GC25: Wednesday	<ul style="list-style-type: none"> <li>Separation of variables</li> <li>Applications of differential equations, including Newton's law of cooling, radioactive decay</li> </ul>	
8	9-13 June GC25: Wednesday	<ul style="list-style-type: none"> <li>Applications of differential equations, including Newton's law of cooling, radioactive decay (continued)</li> <li>The logistic differential equation</li> <li>Slope field for a differential equation</li> </ul>	
9	16-20 June	<b>Unit 4 Topic 2: Rates of change and differential equations</b> <ul style="list-style-type: none"> <li>Displacement, velocity and acceleration</li> <li>Differential equations of velocity and acceleration</li> </ul>	
10	23-27 June	<ul style="list-style-type: none"> <li>Simple harmonic motion</li> <li>Newton's laws of motion for constant force, momentum, resultant force, action and reaction</li> </ul>	
<b>School holidays: Saturday June 28 - Sunday July 13</b>			

**Term 3**

Week	Date	Topics	Assessment
1	14-18 July	<ul style="list-style-type: none"> <li>Inclined planes</li> <li>Connected particles</li> <li>Non-constant forces</li> </ul>	
2	21-25 July	<b>Unit 4 Topic 3: Statistical inference</b> <ul style="list-style-type: none"> <li>Probability density function</li> <li>Sample means and central limit theorem</li> <li>Confidence intervals for the population mean</li> </ul>	
3	28 July-1 August	<ul style="list-style-type: none"> <li><b>Revision for IA3 content</b></li> </ul>	
4	4-8 August	<ul style="list-style-type: none"> <li><b>Revision and exam</b></li> </ul>	<b>IA3 Unit 4 Exam Friday L3 &amp; 4</b>
5	11-15 August GC25: Tuesday	<b>Review:</b> <ul style="list-style-type: none"> <li>Unit 3 Topic 1: Proof by induction</li> <li>Unit 3 Topic 2: Vectors and matrices</li> </ul>	
6	18-22 August GC25: Tuesday	<ul style="list-style-type: none"> <li>Unit 3 Topic 3: Complex numbers 2</li> </ul>	
7	25-29 August GC Show Day: Friday	<ul style="list-style-type: none"> <li>Unit 4 Topic 1: Integration and applications of integration</li> </ul>	
8	1-5 September	<ul style="list-style-type: none"> <li>Unit 4 Topic 2: Rates of change and differential equations</li> <li>Unit 4 Topic 3: Statistical inference</li> </ul>	
9	8-12 September	<b>Mock Exams</b>	
10	15-19 September	<b>Mock Exams</b>	
<b>School holidays: Saturday September 20 – Sunday October 4</b>			

### Term 4

Week	Date	Topics	Assessment
1	6-10 October <small>King's Birthday: Monday</small>	<ul style="list-style-type: none"> <li>• REVISION UNIT 3 &amp; 4</li> </ul>	
2	13-17 October	<ul style="list-style-type: none"> <li>• REVISION UNIT 3 &amp; 4</li> </ul>	
3	20-24 October	<ul style="list-style-type: none"> <li>• No classes for Applied and Certificate subjects.</li> <li>• Study lessons for General subjects.</li> </ul>	
4	27-31 October	<b>EXTERNAL EXAMS</b>	<b>External Assessment: Unit 3 and 4</b>
5	3-7 November		
6	10-14 November		
7	17-21 November		
		<b>Final Week Events</b>	