**Core 1 Scheme of Work (Estimated 35 lessons)**

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| **Chapter 1 – Algebra and functions** | **Duration: 2 lessons max** |
| Students need to be able to:* Simplify expressions by collecting like terms
* Simplify expressions and functions by using rules of indices
* Expand a single/double bracket
* Factorise into a single bracket
* Factorise a quadratic into 2 brackets
* Perform calculations using Index laws
* Add, subtract, multiply and divide surds
* Simplify expressions involving surds
* Rationalise the denominator when it is a surd

In reality students should find this chapter very straightforward. I’d recommend a quick recap of Surds and index laws and setting homework so students familiarise themselves with the content outside of lesson time. | Suggested resources:* C1 Textbook
* Powerpoint
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| **Chapter 2 – Quadratic functions** | **Duration: 3 lessons** |
| Students need to be able to:* Plot the graph of a Quadratic function
* Solve quadratic equations using factorisation
* Rewrite and solve quadratic equations by completing the square
* Solve quadratic equations by using the quadratic formula
* Recognising which of the know methods is most appropriate in a given situation
* Sketch graphs based on whether the x2 coefficient is positive or negative, and using the discriminant to determine the number of roots. Students should also find the y and x intercepts where possible.
* Answer questions involving the number of roots and an unknown in the quadratic equation (usually ‘k’). The book does not contain much of this! (Eg Example 15 p24)
 | Suggested resources:* C1 Textbook
* Powerpoint
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| **Chapter 3 – Equations and Inequalities** | **Duration: 4 lessons** |
| Students need to be able to:* Solve simultaneous equations by elimination, possibly including changing one so the x or y coefficients are equal/opposite
* Solve simultaneous equations by substitution
* Use the substitution method to solve simultaneous equations where one is linear and one is quadratic (and understand they get 2 PAIRS of answers)
* Solve linear inequalities and use a number line to identify solutions (if there are any) for multiple inequalities
* Solve a quadratic inequality by factorisation and use of a sketch to identify the section(s) required
 | Suggested resources:* C1 Textbook
* Powerpoint
* Past Exam Questions sheet
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| **Chapter 4 – Sketching curves** | **Duration: 4 lessons** |
| Students need to be able to:* Sketch cubic equations of the form ax3 + bx2 + cx + d by finding the x and y intercepts
* Factorise cubic equations by first removing an x term and factorizing the quadratic which remains
* Recognise where a repeated root means the curve just touches the x-axis
* Sketch equations of the form y = x3 and simple transformations of it
* Sketch the reciprocal function y = k/x
* Sketch curves of functions to show points of intersection and solutions to equations
* Transform graphs of functions in all ways (translations, reflections and enlargements)
* Recognise asymptotes
* Track the changes of a given coordinate as transformations are applied to the graph
 | Suggested resources:* C1 Textbook
* Powerpoint
* Past Exam Questions sheet
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| **Chapter 5 – Coordinate geometry in the (x,y) plane** | **Duration: 5 lessons** |
| Students need to be able to:* Write the equation of a straight line in the form y = mx + c or ax + by + c = 0
* Recognise how to find the gradient and y-intercept of a line from its equation
* Find the gradient of a line by using the formula

$$m=\frac{y\_{2}-y\_{1}}{x\_{2}-x\_{1}}$$* To find the equation of a line from a coordinate and the gradient by using the formula

$$y-y\_{1}=m(x-x\_{1})$$* To find the equation of a line from 2 coordinates using the formula

$$\frac{y-y\_{1}}{y\_{2}-y\_{1}}=\frac{x-x\_{1}}{x\_{2}-x\_{1}}$$(you can also use a combination of the previous methods for this!)* Find the gradient of a line perpendicular to a given line
* Find the equation of a line perpendicular to a given line, passing through a given coordinate
 | Suggested resources:* C1 Textbook
* Powerpoint
* Past Exam Questions sheet
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| **Chapter 6 – Sequences and series** | **Duration: 5 lessons** |
| Students need to be able to:* Find and use a term-to-term rule
* Find a formula for the nth term of a sequence
* Use simultaneous equations to find the nth term of a sequence given 2 terms and their positions in it
* Understand and use formulae for recurrence relationships. They will usually find the notation a bit confusing to start with.
* Know the definition of an Arithmetic sequence
* Know and be able to use the formula

$$a+\left(n-1\right)d$$* Know and be able to use the formulae

$\frac{n}{2}\left(2a+(n-1)d\right)$ $\frac{n}{2}(a+L)$* They will also need to be able to derive the formula above
* Use the formulae above in context ie) ‘worded’ questions
* Understand and use the ‘sum of’ symbol Σ in questions
 | Suggested resources:* C1 Textbook
* Powerpoint
* Past Exam Questions sheet
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| **Chapter 7 – Differentiation** | **Duration: 6 lessons** |
| Students need to be able to:* Differentiate a single term xn where n is an integer or fraction
* Differentiate an expression containing several terms added or subtracted
* Use differentiation to find the gradient of a curve at a given point
* Use differentiation to find the point(s) which has/have a specified gradient
* Differentiate expressions of the form axn
* Simplify expressions by multiplication or division to make them easier to differentiate
* Find the second order derivative by differentiating twice
* Understand that differentiation represents rate of change at a particular time and solve questions of this type
* Use differentiation to find the gradient of the tangent to a curve and then find the gradient of the normal which is perpendicular
 | Suggested resources:* C1 Textbook
* Powerpoint
* Past Exam Questions sheet
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| **Chapter 8 – Integration** | **Duration: 6 lessons** |
| Students need to be able to:* Integrate functions of the form axn by reversing the process of differentiation
* Remember to include + C!
* Consider terms which are added or subtracted separately longer expressions
* Understand and use the correct notation for integration
* Simplify terms before integrating by using index laws or expanding brackets etc…
* Find the constant of integration c when given any point on the curve
 | Suggested resources:* C1 Textbook
* Powerpoint
* Past Exam Questions sheet
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