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

|  |  |
| --- | --- |
| **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 |

|  |  |
| --- | --- |
| **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 |

|  |  |
| --- | --- |
| **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 |
| **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 |

|  |  |
| --- | --- |
| **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 * To find the equation of a line from a coordinate and the gradient by using the formula * To find the equation of a line from 2 coordinates using the formula   (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 |

|  |  |
| --- | --- |
| **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 * Know and be able to use the formulae      * 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 |

|  |  |
| --- | --- |
| **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 |

|  |  |
| --- | --- |
| **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 |