Tear 12	**Unit 1**	**Unit 2**	**Unit 3**	**Unit 4**	**Unit 5**	**Unit 6**
Topic/Theme/ Focus	In this unit students will meet new concepts in mechanics They will cover fundamental skills such as: Using dimensions to understand formulae. Analysing problems by considering work, energy and power. Using Hooke's law to solve problems involving elastic strings and springs. Analysing collisions by considering momentum and impulse in one and two dimensions. Using equations to describe motion in a horizontal circle.	In this unit students will develop their understanding of complex numbers vectors They will learn fundamental skills such as: How to use De Moivre's theorem and find complex roots of unity. Calculating the vector product to find angles and areas. Using the vector equation of a plane and finding distances.	In this unit students will learn work further with graphs and matrices. They will learn fundamental skills such as: Solving problems using reciprocal and modulus functions. Finding the oblique asymptotes of a curve. Sketching and transforming graphs. Working with matrices in three dimensions. Using eigenvectors to diagonalize a matrix.	In this unit students will deepen their understanding of mechanics They will learn fundamental skills such as: Analysing motion in a vertical circle using energy considerations. Calculating the centre of mass of a lamina and a solid. Investigating toppling and sliding of objects on an inclined plane.	In this unit students will develop their algebraic techniques and learn further uses of calculus. They will cover fundamental skill such as: Using partial fractions to sum series. Expanding functions using Maclaurin series. Evaluating limits of series using L'Hopital's rule. Using improper integrals with limits. Differentiating inverse trigonometric and hyperbolic functions. Using reduction formulae. Finding the area enclosed by a polar curve.	In this unit students will learn how to solve differential equations accurately and using approximate methods. They will learn fundamental skills such as: Solving first and second order differential equations and modelling harmonic motion. Working with differential equations involving more than two variables. Using Simpson's rule for numeric integration. Using Euler's method to find approximate solutions to differential equations.
Key vocabulary	Kinetic Gravitational Assumption Consistent Momentum Impulse Conservation Linear Angular	Exponential Perpendicular Commutative Distributive	Modulus Oblique Conic Hyperbolic Determinant Inverse Eigenvalue Eigenvector	Couple Lamina Coefficient Tension Reaction	Validity Derivative Indeterminate Improper Convergent Divergent	Auxiliary Homogenous Particular Complementary Damping Ordinate Midpoint