Maths Year 13 Applied		***Curriculum Checkpoints: What do students know and what can they do?***			
Summative Comment		**Developing**	**Securing**	**Mastering**	**Excelling**
AF1	**Regression & Correlation**	*Exponential model* *change the variable in a regression line;* *and to estimate values from regression line*	Work with equations of the form $y = ax^n$ and $y = kb^x$. You will need to know how to put these into linear form and be able to estimate a and n or k and b	Understand correlation coefficients; calculate the PMCC (calculator only);	to interpret a correlation coefficient and to conduct a hypothesis test for a correlation coefficient
AF2	**Probability**	Understand and be able to use probability formulae using set notation;	Use tree diagrams, Venn diagrams and two-way tables;	Use the conditional probability formula.	Using conditional probability in modelling with probability
AF3	**Normal distribution**	Understand the properties of the Normal distribution; be able to find probabilities using the Normal distribution;	know the position of the points of inflection of a Normal distribution. be able to find the mean and variance of a binomial distribution;	Understand and able to apply a continuity correction and to use the Normal distribution as an approximation to the binomial distribution. $\mu=np$ and $\sigma^2=np(1-p)$).	Conduct a statistical hypothesis test for the mean of the Normal distribution and to interpret the results in context.

AF4	**Moments**	Types of forces and force diagrams realise that a force can produce a turning effect; know that a moment of a force is given by the formula force × distance giving Nm and know what the sense of a moment is;	Understand that the force and distance must be perpendicular to one another; to draw mathematical models to represent horizontal rod problems;	Realise what conditions are needed for a system to remain in equilibrium and to solve problems when a bar is on the point of tilting	Find missing distance from taking moments at a given point.
AF5	**Forces and friction**	Understand that a rough plane will have an associated frictional force, which opposes relative motion (i.e. the direction of the frictional force is always opposite to how the object is moving or 'wants' to move);	Understand that the 'roughness' of two surfaces is represented by a value called the coefficient of friction represented by μ;	Know that $0 \leq \mu$ but that there is no theoretical upper limit for μ although for most surfaces it tends to be less than 1 and that a 'smooth' surface has a value of $\mu = 0$;	Draw force diagrams involving rough surfaces which include the frictional force understand and be able to use the formula $F \leq \mu R$.
AF6	**Projectiles**	Find the time of flight of a projectile;	Find the range and maximum height of a projectile;	Derive formulae to find the greatest height, the time of flight and the horizontal range (for a full trajectory);	know how to modify projectile equations to take account of the height of release; to derive and use the equation of the path Horizontally, $u = U \cos \alpha$ and if upwards is positive, vertically, $u = U \sin \alpha$.

AF7	**Application & forces (static and modelling with statics)**	Understand that a body is in equilibrium under a set of concurrent (acting through the same point) forces is if their resultant is zero; know that vectors representing forces in equilibrium form a closed polygon;	Understand how to solve problems involving equilibrium of a particle under coplanar forces, including particles on inclined planes and 2D vectors; to solve statics problems for a system of forces which are not concurrent (e.g. ladder problems), thus applying the principle of moments for forces at any angle.	Know and understand the meaning of Newton's second law; To formulate the equation of motion for a particle in 1-dimensional motion where the resultant force is mass × acceleration;	Formulate the equation of motion for a particle in 2-dimensional motion where the resultant force is mass × acceleration; Formulate and solve separate equations of motion for connected particles, where one of the particles could be on an inclined and/or rough plane.
AF8	**Constant acceleration (equations of motion**	Recognise when the use of constant acceleration formulae is appropriate and to write positions, velocities and accelerations in vector form;	Understand the language of kinematics appropriate to motion in 2 dimensions to find the magnitude and direction of vectors;	Extend techniques for motion in 1 dimension to 2 dimensions by using vectors; know how to use velocity triangles to solve simple problems;	Understand and use suvat formulae for constant acceleration in 2D; know how to apply the equations of motion to i, j vector problems; to use $v = u + at$, $r = ut + 1/2at2$ etc. with vectors given in i , j or column vector form.