Foxford Learning Plan

YEAR 13

Topic STATISTICS and MECHANICS A2

Spring 2

Key Vocabulary

Regression	A measure of the relation between the mean value of one variable (e.g. output) and corresponding values of other variables
Hypothesis	A supposition or proposed explanation made on the basis of limited evidence as a starting point for further investigation.
Set	A set is a collection of elements. The elements that make up a set can be any kind of mathematical objects
Normal Distribution	Is a probability distribution used to model phenomena that have a default behaviour and cumulative possible deviations
Moment	An expression involving the product of a distance and physical quantity
Force	An influence tending to change the motion of a body or produce motion or stress in a stationary body
Resultant Force	a resultant force is the single force and associated torque obtained by combining a system of forces and torques acting on a rigid body via vector addition
Friction	The resistance that one surface or object encounters when moving over another
Projectile	An object propelled by the application of an external force, which is allowed to move freely under the influence of gravity and air resistance
Equilibrium	A state in which opposing forces or influences are balanced
Tension	A strained state or condition resulting from forces acting in opposition to each other
Acceleration	Acceleration is the rate of change of the velocity of an object with respect to time

Key Skills

Over the course of the topic, I will be able to: -
Understand exponential models in bivariate data Use the change of variable to estimate coefficients in an exponential model Understand and calculate the PMCC Carry out a Hypothesis test for zero correlation
Understand set notation and conditional probability Use probability formulae to solve problems Solve conditional probability using tree and Venn diagrams
Understand the normal distribution and its characteristics Find percentage points and calculate values on a standard normal curve Approximate a binomial distribution using a normal distribution Carry out a hypothesis test for the mean of a normal distribution
Calculate the turning effect and the resultant moment of a force applied to a rigid body Solve problems involving uniform rods in equilibrium, non-uniform rods and rods on the point of tilting
Resolve forces into components Solve problems involving smooth or rigid inclined planes Understand friction and the coefficient of friction
Model motion under gravity for an object projected horizontally Resolve velocity into components Solve problems involving particles projected at an angle
Find an unknown force when a system is in equilibrium Solve statics problems involving weight, tension and pulleys Solve problems involving limiting equilibrium, motion on rough and smooth inclined planes and connected particles that require the resolution of forces
Work with vectors for displacement, velocity and acceleration when using the vector equation of motion Use calculus with harder functions of time involving variable acceleration Differentiate and integrate vectors with respect to time



I will Understand

1. Regression, correlation and hypothesis testing
2. Conditional probability
3. The normal distribution
4. Moments, forces and friction and their applications
5. Projectiles and further kinematics