

TY Applied Mathematics TY 2022– 2023

Subject: Applied Mathematics

Number of periods: Two per week (classroom-based), over six – seven weeks

Class teacher: Tom Tierney + Derek Mulvany

Aims and objectives: Students will learn to:

- Convert a word problem into a set of equations, to solve these equations, and to interpret the result.
- Work individually and collaboratively in groups on a variety of written exercises and problems.
- Develop an understanding and appreciation of the usefulness of applied mathematical techniques.
- Organise their own learning while completing a detailed schedule of online assessments.

Course content: Students will be introduced to the following areas of study:

- Accelerated linear motion: This is all about bodies such as cars, trains, bicycles, and so on moving under constant acceleration. Specifically, students will learn how to: a) Use the UVAST equations of motion under constant acceleration to answer questions about distance travelled, speed and time taken.
- Use velocity-time graphs to calculate distance travelled, acceleration and average speed, in the context of motion under constant acceleration.
- Projectiles on a plane: This is all about objects such as a golf ball, a javelin, a cannonball, and so on being fired over flat ground. Air resistance will be ignored.
- Use trigonometric ratios or similar triangles to answer questions about maximum height reached, total flight time, average speed ascending, range, speed and direction.

Decision mathematics: (1 class per week)

This is all about using mathematical tools to analyse sequential decision processes such as managing a retail store, playing a game of tennis, driving from one location to another, laying telecommunications cable and so on. Specifically, students will learn how to:

- a) Use and apply Prim's algorithm and Kruskal's algorithm to find a minimum spanning tree
- b) Use and apply Dijkstra's algorithm to solve shortest route problems tree in an undirected network.