Year 12 – Numeracy **Module 4:** **Time: 60 Hours**

Context:
This module provides students with the mathematical knowledge, understanding and skills to solve problems relating to operations with whole numbers, distance, area, volume and time. Students are provided with opportunities to extract and interpret information from a variety of simple forms of data representation that are used in everyday contexts. Teachers are encouraged to apply the content of this module in contexts which are meaningful and of interest to their students. The numerical focus for the module is whole numbers.
This module introduces students to the Numerical Reasoning and Mathematical Thinking (NRMT) process. This process includes the following steps:

- interpreting the task and the key information to identify the problem
- choosing knowledge and skills which could help to solve the problem
- applying their existing knowledge and strategies to obtain a solution
- reflecting on the solution in relation to the context
- communicating the solution to the problem.

In this module, the NRMT process needs to be taught explicitly, with students practising and using each of the steps as they learn to choose and use the four operations to solve everyday problems related to the three numeracy contexts: personal and community, workplace and employment, and education and training.

Syllabus Content: Module 4

- N6-1.1 – recognises and applies functional numeracy concepts in practical situations, including personal and community, workplace and employment, and education and training contexts
- N6-1.2 – applies numerical reasoning and mathematical thinking to clarify, efficiently solve and communicate solutions to problems
- N6-1.3 – determines whether an estimate or an answer is reasonable in the context of a problem, evaluates results and communicates conclusions
- N6-2.1 – chooses and applies appropriate operations with whole numbers, familiar fractions and decimals, percentages, rates and ratios to analyse and solve everyday problems
- N6-2.2 – chooses and applies efficient strategies to analyse and solve everyday problems involving metric relationships, distance and length, area, volume, time, mass, capacity and temperature
- N6-2.3 – chooses and applies efficient strategies to analyse and solve everyday problems involving data, graphs, tables, statistics and probability
- N6-2.4 – chooses and applies efficient strategies to analyse and solve everyday problems involving money and finance

- N6-2.5 – chooses and applies efficient strategies to analyse and solve everyday problems involving location, space and design
- N6-2.6 – chooses and applies appropriate numeracy operations and techniques to analyse and resolve everyday situations
- N6-3.1 – chooses and uses appropriate technology to access, organise and interpret information in a range of practical personal and community, workplace and employment, and education and training contexts
- N6-3.2 – chooses and uses appropriate technology to analyse and solve problems, represent information and communicate solutions in a range of practical contexts

Student Outcomes: **N6 - 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 3.1, 3.2**

	Student is able to:	Implications, considerations and implementations	Resources
Module 4.1: Rates and ratios			
(i)	• identify everyday situations which involve rates	• identify the units used to describe rates, such as km/h, cents/litre, $/kg or $/m, $/h, and explain their meaning	
(ii)	• understand and use rates as relationships between two amounts in everyday contexts	• relate the idea of a rate to situations such as determining how much it would cost for 3.5 kg of apples if they are $3.99/kg, or determining the feed amount for a particular animal based on its weight	
(iii)	• use repeated addition, multiplication or division to work out simple rates, such as litres per 100 kilometres, with and without the use of digital technologies		
(iv)	• compare rates, such as dollars per kilo, to determine which is the better buy	• identify whether an estimation or an accurate answer is needed in everyday situations	
(v)	• identify everyday situations which involve the use of ratios		

(vi)	• understand simple ratios as proportional relationships between two or more amounts		
(vii)	• determine quantities based on a given ratio in everyday contexts		
(viii)	• understand the relationships between ratios and fractions, decimals and percentages	• make connections between commonly used ratios and fractions, decimals and percentages of equivalent value	
(ix)	• use simple ratios in practical contexts	• interpret simple scales, such as 1:100, on maps and plans • make mixtures according to directions	
(x)	• use repeated addition, multiplication or division to increase or decrease amounts in practical situations involving ratios		
(xi)	• solve a range of everyday problems involving rates and ratios		
(xii)	• determine whether an estimation or an accurate answer is needed in everyday contexts involving rates and ratios		
(xiii)	• determine whether an answer is reasonable by using estimation and mental calculations		
(xiv)	• communicate and interpret information about rates and ratios using language and symbols consistent with the context		

Module 4.2: Statistics and probability			
(i)	• identify and describe the use of statistics and various data displays in everyday life, work situations and media		
(ii)	• collect and organise familiar data, choosing an appropriate table, graph or chart to clearly represent the data set		
(iii)	• use a spreadsheet to construct graphs and charts from simple everyday data, using simple scales, axes and descriptive labels		
(iv)	• read and interpret simple tables and graphs	• use reasoning to draw simple inferences from beyond the data	
(v)	• critically evaluate simple graphs for misleading information	• discuss a variety of graphs which misrepresent information in advertising	
(vi)	• understand and use three forms of average, mean, mode and median, in simple everyday contexts	• discuss the use of mean, mode and median to summarise data as the ‘average’ or typical value • relate the shape of a graph to the mean, mode and median	
(vii)	• determine whether a prediction or inference is reasonable		
(viii)	• communicate information about probability and statistics using language and symbols consistent with the context		

(ix)	• identify and describe situations in everyday life, work situations and media, in which predictions are made, based on probability		
(x)	• understand that chance is measured on a scale of 0 to 1, with zero meaning impossible and 1 meaning certain to happen		
(xi)	• place everyday terms for chance such as ‘certain’, ‘fifty-fifty’, ‘likely’ or ‘impossible’, on the 0 to 1 scale and relate them to fractions, decimals and percentages	• label a number line with 0, 0.5, and 1 and link to terms of likelihood • assign probability values from 0 to 1 in relation to familiar events	
(xii)	• order outcomes from least likely to most likely, using simple fractions, decimals and percentages		
(xiii)	• use, describe, compare and interpret the likelihood of everyday chance events using routine fractions, decimals and percentages		
(xiv)	• predict the likelihood of familiar everyday events happening, based on past experience or data		
(xv)	• determine whether a prediction is reasonable		
Module 4.3: Exploring with NRMT			
(i)	• order, compare and use whole numbers, fractions, decimals and percentages		
(ii)	• compare and use rates and ratios		

(iii)	• understand and use the relationships between the four operations to assist in calculations		
(iv)	• choose and use the appropriate operation to efficiently solve a problem, with and without the use of ICT PLO		
(v)	• read, record, order and compare measurements of time using different time units PLO		
(vi)	• solve problems involving time PLO		
(vii)	• read, record, order and compare length, cumulative distance, perimeter, area, volume, mass and capacity PLO		
(viii)	• estimate, measure and calculate length, cumulative distance, perimeter, area, volume, mass and capacity PLO		
(ix)	• solve problems involving length, cumulative distance, perimeter, area, volume, mass and capacity PLO		
(x)	• read, interpret and draw various maps and plans PLO		
(xi)	• construct simple 3D objects from plans PLO		
(xii)	• solve problems involving maps, plans, location and shapes PLO		
(xiii)	• read and interpret various forms of data, tables, charts and graphs PLO		

	• make decisions based on the likelihood of simple events PLO		
	• solve problems involving data, graphs, tables, statistics and probability PLO		

Literacy in Mathematics	
Language	
Technologies:	
Students with Special Needs	**Enrichment :**
	Students with Learning Difference: