Government of **Western Australia**
School Curriculum and Standards Authority

SAMPLE COURSE OUTLINE

MATHEMATICS ESSENTIAL
GENERAL YEAR 12

Sample course outline

Mathematics Essential – General Year 12

Unit 3 and Unit 4

Semester 1

Week	Key teaching points
1–11	For topics 3.1, 3.2 and 3.3 students apply the mathematical thinking process to real-world problems relating to the topic content. Students: • interpret the task and gather the key information • identify the mathematics which could help to complete the task • analyse information and data from a variety of sources • apply existing mathematical knowledge and strategies to obtain a solution • verify the reasonableness of the solution • communicate findings in a systematic and concise manner.
1 (3 hours)	Linear measure The perimeter of polygons and circles and composites of familiar shapes. Solve practical problems involving perimeter. 3.1.1
2–3 (6 hours)	Area measure The area of parallelograms, trapeziums, circles and semi-circles. The area of composite figures using decomposition into familiar shapes. Surface area of cubes, rectangular and triangular prisms, spheres and cylinders using nets where appropriate. Solve practical problems involving area and surface area, including composite solids. 3.1.2–3.1.5, 3.2.2
3–4 (6 hours)	Volume and capacity The volume and capacity of cylinders, pyramids and spheres. The relationship between cubic centimetres and millilitres, cubic metres and kilolitres. Solve problems involving volume and capacity. 3.1.6–3.1.7
5 (3 hours)	Geometry and three dimensional objects Interpret two dimensional representations of three dimensional objects and elevation views of models. Sketch elevation views of different models. 3.2.1–3.2.3, 3.2.9–3.2.11
5–6 (5 hours)	Interpret and create scale drawings Interpret scale drawings from practical situations and determine actual measurements. Construct scale drawings by hand and by using appropriate software/technology. Solve practical problems involving estimation and comparison of quantities, materials and costs using actual measurements from scale drawings. 3.2.4–3.2.8.
7–8 (7 hours)	Right-angled triangles Apply Pythagoras' Theorem and trigonometric ratios to solve problems in practical, two-dimensional views, including problems involving angles of depression and elevation. 3.2.12–3.2.16
8–9 (5 hours)	Cartesian plane Interpret and plot points on a two-dimensional Cartesian plane. Generate tables and graph co-ordinates for linear functions from practical situations. Interpret, use and draw graphs from practical situations, including travel graphs, time series and conversion graphs. Describe trends in time series data. 3.3.1–3.3.6

Week	Key teaching points
10–11 (5 hours)	Using graphs in practical situations Describe, determine and use the features of linear functions from practical situations; rate of change, vertical intercept, point of intersection, 'break-even' point. Solve practical problems involving linear relationships. 3.3.7–3.3.10
11–14	For topic 3.4 students apply the statistical investigation process to real-world tasks relating to the topic content. Students: • clarify the problem and pose one or more questions that can be answered with data • design and implement a plan to collect or obtain appropriate data • select and apply appropriate graphical or numerical techniques to analyse the data • interpret the results of this analysis and relate the interpretation to the original question • communicate findings in a systematic and concise manner.
11–12 (7 hours)	Data collection Investigate the conducting of a census or survey, with reference to the target population. Investigate methods of sampling. Interpret results from surveys, including those in the media. 3.4.1–3.4.11
13–14 (8 hours)	Bivariate scatterplots Patterns and features of bivariate data, including dependent and independent variables and their association. Trend lines by eye, relationships between variables and predictions by interpolation and extrapolation. 3.4.12–3.4.19
15	Examination week

Semester 2

Week	Key teaching points
1–5	For topic 4.1 students apply the statistical investigation process to real-world tasks relating to the topic content. Students: • clarify the problem and pose one or more questions that can be answered with data • design and implement a plan to collect or obtain appropriate data • select and apply appropriate graphical or numerical techniques to analyse the data • interpret the results of this analysis and relate the interpretation to the original question • communicate the findings in a systematic and concise manner.
1–3 (10 hours)	Probability and simulations Language of probability and numerical expressions using fractions, decimals, ratios and percentages. Simulations using technology. The law of large numbers and the relationship of relative frequency to probability. 4.1.1–4.1.6
3–5 (10 hours)	Simple probabilities in practical situations Experiments and sample spaces which represent practical situations. Applications of probability for decision making, predicting proportions and number or outcomes that are likely to occur. 4.1.3, 4.1.7–4.1.11

Week	Key teaching points
6–14	For topics 4.2 and 4.3 students apply the mathematical thinking process to real-world problems relating to the topic content. Students: • interpret the task and gather the key information • identify the mathematics which could help to complete the task • analyse information and data from a variety of sources • apply existing mathematical knowledge and strategies to obtain a solution • verify the reasonableness of the solution • communicate findings in a systematic and concise manner.
6–7 (7 hours)	Earth geometry Methods of locating positions on the earth's surface given latitude and longitude; global positioning system, globe, atlas and digital technologies. Calculations of distance between two places on Earth on same longitude using arc length formula. Distance between two places on Earth using technology. Solve practical problems involving the location of and distance between positions on the Earth's surface. 4.2.1–4.2.3
7–9 (8 hours)	Time Link between longitude and time. Problems involving time zones in Australia and neighbouring nations, Greenwich Mean Time and International Date Line, time differences, travel involving time zone changes. 4.2.4–4.2.9
9–10 (5 hours)	Compounding relationships Real-life, compounding situations expressed as a recurrence relationship; compound interest, population growth. Solve practical problems involving compounding situations. 4.3.1–4.3.3
11–12 (8 hours)	Compounding loans and investments Future values and total interest, numerical and graphical comparison between simple interest and compound interest loans and investments. Effects of change of interest rate and number of compounding periods. Solve practical problems involving compounding loans and investments 4.3.4–4.3.6
13–14 (8 hours)	Reducing balance loans Use technology and a recurrence relation to model a reducing balance loan. Effect of interest rates and repayment amount when repaying a loan. Solve practical problems involving reducing balance loans. 4.3.7–4.3.8
15	Year 12 Examination week – work experience