Course Outline -2018

Mathematics Applications – ATAR Year 11

Unit 2

This course outline assumes an allocation of 4 hours contact time per week for the course. The time allocated to the topics covered within this course outline is given as a suggestion. Teachers may wish to adjust the time allocation according to their student needs. Also the time of +1 in a given period is allocated to run an in-class assessment during the course contact time.

Mathematics Applications Units 1 and 2 will be studied concurrently as a unit pair though the content will be taught sequentially.

Text references: Sadler A.J, Applications Mathematics Units 1 & 2.

Resources: Casio ClassPad II Calculator, Casio FX-82AU Scientific Calculator

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| **Semester 2** | | | | | | |
| **Week** | | **Syllabus Unit 2** | **Textbook Reference** | **Mathspace** | | **Assessment** |
| **Term 2** | | | | | | |
| **7 – 8**  **(7 Hours)** | **Univariate data**  2.1.2 classify a categorical variable as ordinal, such as income level (high, medium, low) or nominal, such as place of birth (Australia, overseas) and use tables and bar charts to organise and display data  2.1.3 classify a numerical variable as discrete, such as the number of rooms in a house, or continuous, such as the temperature in degrees Celsius  2.1.4 with the aid of an appropriate graphical display (chosen from dot plot, stem plot, bar chart or histogram), describe the distribution of a numerical data set in terms of modality (uni or multimodal), shape (symmetric versus positively or negatively skewed), location and spread and outliers, and interpret this information in the context of the data  2.1.5 determine the mean and standard deviation of a data set using technology and use these statistics as measures of location and spread of a data distribution, being aware of their limitations | | **Unit 2 Chapter 1**  **Unit 2 Chapter 3** | **Sadler Unit 2 Ch 1&3** | |  |
| **Term 3** | | | | | | |
| **1-2**  **9 – 10**  **(8 Hours)** | **Comparing data**  2.1.10 construct and use parallel box plots (including the use of the ‘Q1 – 1.5 x IQR’ and ‘Q3 + 1.5 x IQR’ criteria for identifying possible outliers) to compare groups in terms of location (median), spread (IQR and range) and outliers, and interpret and communicate the differences observed in the context of the data  2.1.11 compare groups on a single numerical variable using medians, means, IQRs, ranges or standard deviations, and as appropriate; interpret the differences observed in the context of the data and report the findings in a systematic and concise manner | | **Unit 2 Chapter 2**  **Unit 2 Chapter 4** | **Sadler Unit 2 Ch 2&4** | **Test 5 (6%)**  Term 3 week 2 | |
| **3**  **(4 Hours)** | **The statistical investigation process**  2.1.1 review the statistical investigation process; identifying a problem and posing a statistical question, collecting or obtaining data, analysing the data, interpreting and communicating the results  2.1.12 implement the statistical investigation process to answer questions that involve comparing the data for a numerical variable across two or more groups; for example, are Year 11 students the fittest in the school? | | **Unit 2 Chapter 5** | **Sadler Unit 2 Ch 5** | | **Investigation 3 (5%)**  **Term 3 week 4** |
| **4-5**  **(10 Hours)** | **Linear Equations and their graphs**  2.3.1 identify and solve linear equations (with the aid of technology where complicated manipulations are required)  2.3.2 develop a linear formula from a word description and solve the resulting equation  2.3.3 construct straight-line graphs both with and without the aid of technology  2.3.4 determine the slope and intercepts of a straight-line graph from both its equation and its plot  2.3.5 construct and analyse a straight-line graph to model a given linear relationship; for example, modelling the cost of filling a fuel tank of a car against the number of litres of petrol required.  2.3.6 interpret, in context, the slope and intercept of a straight-line graph used to model and analyse a practical situation | | **Unit 2 Chapter 6**  **Unit 2 Chapter 7**  **Unit 2 Chapter 8** | **Sadler Unit 2 Ch 6-8** | |  |
| **5-6**  **(6 Hours)** | **Simultaneous equations**  2.3.7 solve a pair of simultaneous linear equations graphically or algebraically, using technology when appropriate  2.3.8 solve practical problems that involve determining the point of intersection of two straight-line graphs; for example, determining the break-even point where cost and revenue are represented by linear equations | | **Unit 2 Chapter 12** | **Sadler Unit 2 Ch 12** | | **Test 6 (8%)**  **Term 3 week 7** |
| **7-8**  **(8 Hours)** | **Piece-wise Functions**  2.3.9 sketch piece-wise linear graphs and step graphs, using technology when appropriate  2.3.10 interpret piece-wise linear and step graphs used to model practical situations; for example, the tax paid as income increases, the change in the level of water in a tank over time when water is drawn off at different intervals and for different periods of time, the charging scheme for sending parcels of different weights through the post | | **Unit 2 Chapter 9** | **Sadler Unit 2 Ch 9** | | **Investigation 4 (5%)**  Term 3 Week 9 |
| **9-T41**  **(12 Hours)** | **Normal Distribution**  2.1.6 use the number of deviations from the mean (standard scores) to describe deviations from the mean in normally distributed data sets  2.1.7 calculate quantiles for normally distributed data with known mean and standard deviation in practical situations  2.1.8 use the 68%, 95%, 99.7% rule for data one, two and three standard deviations from the mean in practical situations  2.1.9 calculate probabilities for normal distributions with known mean μ and standard deviation σ in practical situations | | **Unit 2 Chapter 13** | **Sadler unit 2 Ch 13** | | **Test 7 (4%)**  Term 4 week 1 |
| **Term 4** | | | | | | |
| **2-4**  **(12 Hours)** | **Trigonometry**  2.2.1 use trigonometric ratios to determine the length of an unknown side, or the size of an unknown angle in a right-angled triangle  2.2.2 determine the area of a triangle, given two sides and an included angle by using the rule , or given three sides by using Heron’s rule, and solve related practical problems  2.2.3 solve problems involving non-right-angled triangles using the sine rule (acute triangles only when determining the size of an angle) and the cosine rule  2.2.4 solve practical problems involving right-angled and non-right-angled triangles, including problems involving angles of elevation and depression and the use of bearings in navigation | | **Unit 2 Chapter 10**  **Unit 2 Chapter 11** | **Sadler Unit 2 Ch 10&11** | | **Test 8 (4%)**  Term 4 week 4 |
| **4** | **Catch-up** | | |  | | |
| **5** | **Unit 2 Revision – No Assessment** | | |  | | |
| **6** | **Exam** | | | **Exam**  **25%** | | |