

ST STEPHEN'S SCHOOL (CARRAMAR)

YEAR 12 APPLICABLE MATHEMATICS PROGRAMME

2008

Textbooks

T	Applicable Mathematics	A J Sadler
A	Applicable Mathematics	O. T. Lee
B	Applicable Mathematics	Ellery and Strickland

Semester 1

Weeks	Curriculum Council Objectives	Resources	Assessments
0 1/02/08	Seminars		
1 8/02/08	Descriptive Statistics 3.1 Determine and use measures of central tendency (mean and median) for grouped and ungrouped data and the effect of changes of scale and origin and the effects of outliers on each. Calculate the proportional median for grouped data. 3.2 Determine and use measures of dispersion (range, interquartile range, variance and standard deviation) for grouped and ungrouped data. Examine the effect of changes of scale and origin and the effect of outliers on measures of dispersion.	T Ex3A to E A Ex 1.1 to 1.7 B Ex 4.1 to 4.3	
2 15/02/08	3.3 Construct and interpret box plots, noting their use in comparison of centres and spreads of data. 3.4 Define and use the correlation coefficient as a measure of linear association for bivariate data and observe from examples that correlation does not imply causality.	T Ex 9A to 9E A Ex 2.1to 2.4 B Ex 9.1 to 9.4	
3 22/02/08 Swimming Carnival	3.5 Examine the invariance of the correlation coefficient under changes of origin and scale. 3.6 Find the least squares regression line, examine its properties and draw its graph. 3.7 Use the regression line for interpolation and extrapolation, and observe from examples the danger of the latter		EPW Curve Fitting
4 29/02/08	3.8 Compare graphs of the fitted regression model and observe data to visually assess the appropriateness of the model. 3.9 Calculate and graph residuals for linear models and use them to assess the adequacy of regression models.		
5 7/03/08 Labour Day	Matrices 1.5 Add, subtract and multiply matrices 1.6 Examine the algebraic properties of matrix addition and multiplication	T Ex 2A, 2B A Ex 8.1to 8.6 B Ex 1.1, 1.2	TEST
6 14/03/08	Systems of linear equations and Matrices 1.1 Model problems whose solutions reduce to systems of equations 1.2 Solve systems of linear equations in two and three variables by elimination.	T Ex 2A, 2B A Ex 8.1to 8.6 B Ex 1.1, 1.2	
7 21/03/08 Good Friday	Systems of linear Equations and Matrices 1.3 Examine the coefficient matrix of a system of linear equations and the relationship between row operations on the coefficient matrix and the rearrangement of the equations. 1.4 Solve systems of equations in two and three variables by reducing the coefficient matrix. Reduction to echelon form is not always necessary. Use of graphic calculators to solve systems of equations.	T Ex 2A, 2B A Ex 8.1to 8.6 B Ex 1.1, 1.2	

8 28/03/08 Easter Monday	1.7 Calculate the inverse of a 2 x 2 matrix and recognise a singular 2 x 2 matrix. 1.8 Given an n x n matrix, find the inverse and use it to solve the corresponding system of n linear equations in n unknowns.	T Ex 2A, 2B A Ex 8.1 to 8.6 B Ex 1.1, 1.2	
9 4/04/08	Continue with matrices and their applications		TEST
10 11/04/08	Time Series Data 3.10 Use moving averages and residuals to detect and remove cycles in time series data. Use the least squares regression line and seasonal components for interpolation and extrapolation, where appropriate for linear and periodic models. 3.11 Draw inferences from graphs of time series data.	A Ex 3.1 to 3.4	

Term 2

11 2/05/08	Year 12 Retreat		
12 9/05/08	Sets, Counting and Probability 4.1 Set notation and the set operations of union, intersection and complementation. 4.2 Use Venn diagrams to illustrate concepts and to solve problems in counting and probability.	T Ex 4A to 4C, 7A to 7F A Ex 12.1 to 12.4, Ex 13.1 to 13.4 B Ex 3.1 to 3.4	EPW (Markov in Class) BM
13 16/05/08	4.3 Develop and use the addition and multiplication principles for counting and display outcome sets in trees and systematic lists. 4.4 Investigate subsets of a set to develop and use the notation nCx or nC_x for the number of subsets of size x in a set of n elements	T Ex 6A to 6C	TEST
14 23/05/08	4.5 Develop the set theoretic model of probability with: • Outcomes as elements of a finite set, the sample space • Events as subsets • Intersection, union and complement of events • Probabilities assigned to events. 4.6 Develop the relationship $P(A \cup B) = P(A) + P(B) - P(A \cap B)$ And use it to calculate probabilities.		Ass TEST
15 30/05/08	4.7 Develop and use the concept of conditional probability and use the formula $P(A \cap B) = P(B) \cdot P(A B) = P(A) \cdot P(B A)$ 4.8 Develop the concept of independent events and the use of the formulae: $P(A \cap B) = P(A) \cdot P(B)$ $P(B A) = P(B)$ $P(A B) = P(A)$ Revision of first three topics for exams	T Ex 8A to 8D A Ex 15.1 to 15.4 B Ex 6.1 to 6.6	
16 6/06/08	Exams		
17 13/06/08	Exams		

18 20/06/08	Graphs and the Solutions of Equations 2.1 Investigate the effects of linear changes of variable on the graph of the function and on its algebraic formulation.	T 5A to 5C, 9F, 9G A Ex 4.1 to 4.4, 6.1 B Ex 2.1, 8.1 to 8.4	
19 27/06/08	Matrices 1.9 Examine the geometric properties of 2 x 2 matrices as linear transformations in the plane.	T 2C, 2D, 5E, 5F A Ex 9.5, 10.1 B Ex 4.1	
20 4/07/08	Graphs and the Solutions of Equations 2.2 Solve problems of exponential growth and decay using log linear graphs or exponential regression. 2.3 Solve equations and inequalities graphically.	T 5A to 5C, 9F, 9G A Ex 4.1 to 4.4, 6.1 B Ex 2.1, 8.1 to 8.4	

Semester 2

1 25/07/08	Graphs and the Solutions of Equations 2.4 Model a variety of optimisation problems involving two variables as linear programs and solve graphically.	T Ex 10A to 10F A Ex 7.1 to 7.4 B Ex 7.1 to 7.3	
2 1/08/08	Continue with linear programming		TEST
3 08/08/08	Random variables and their distributions 5.1 Define discrete random variables as functions on a finite set of outcomes and construct examples. 5.2 Determine the probability function of a discrete random variable and use it to calculate probabilities.		
4 15/08/08	5.3 Develop the concept of Bernoulli trials and establish the use of the binomial distribution for the number of successes.		EPW
5 22/08/08	5.4 Calculate and use probabilities associated with the Poisson random variable 5.5 Develop the concepts of continuous random variables and their associated probability density functions.	T 11 B to 11D, 12A, 12B A 17.1, 18.1, 18.2, 19.1, 19.2, 20.1, 21.2 B 10.2, 10.3, 10.4	
6 29/08/08	5.6 Calculate and use probabilities associated with the uniform and exponential distribution		
7 5/09/08	5.7 Calculate and use probabilities associated with normal random variables Develop and use the normal approximation to the binomial and Poisson distribution.	T 12C to 12F A 22.1 to 22.5 B Ex 10.5, 10.6	
8 12/09/08	Finish Random Variables		TEST
9 19/09/08	Exam revision		ASS TEST
10 26/09/08	Exam revision		

APPLICABLE MATHEMATICS ASSESSMENT STRUCTURE 2008

TOPIC TESTS	29% as below
EXTENDED PIECES OF WORK	21% (7 marks each)
OTHER FORMS OF ASSESSMENT	10% (Assignments before each examination)
SEMESTER 1 EXAMINATION	15%
SEMESTER 2 EXAMINATION	25%

At the end of the year the tests will be weighted as follows:-

Test	1	2	3	4	5
Weighting	5%	5%	5%	7%	7%

Extended pieces of work:-

Investigations

Three investigations (EPW) marked on the program they will be worth a total of 21% (7 marks each). These investigations may not be conducted exactly in the week notified but will be in that week or soon thereafter. Students will be notified the date of these ahead of time. In most cases, students will be given material to consider over a period of days before the assessment based on the material. Normally, marks will be allocated weighed in favour of that part of the assessment that is done in class.

Assignment

One revision assignment will be set prior to each examination revising the course. These assignments will be worth 5% each. There will be an in-class validation of these assignments.

Examinations

Examinations will be 150 minutes first semester and 180 minutes for the MOCK and will cover all the work taught to that point of the course.

Students should ensure that they understand the School and Mathematics Department policies on assessments. A doctor's certificate is required if a student is absent from any scheduled assessment. If assessments are late they will attract a penalty. It is important that you know when work is due.

Comparison of Assessment Structure CC and SSS

Table 1	CC	SSS
Syllabus Content	Weighting percentage	
Systems of linear equations and matrices	20-30	20
Graphics and the solution of equations	15-20	20
Descriptive statistics	15-20	20
Sets, counting and probability	15-20	20
Random variables and their distributions	20-25	20

Table 2	CC	SSS
Learning Outcomes	Weighting percentage	
Lower order cognitive objectives *	45-55	50
Higher order cognitive objectives **	45-55	50

Table 3	CC	SSS
Types of Assessment	Weighting percentage	
Extended pieces of work	15-30	21
Other forms of assessment	0-20	10
Tests and Examinations	50-75	69

Prepared by Barbara Marshall

MISCELLANEOUS EXERCISES FROM SADLER

Students are expected to have completed and marked ready for their teacher to check at the end of each topic the miscellaneous exercises from the end of each chapter.

Topic	Date to be finished by	Page	question
Descriptive Statistics	090307	70 90 116 171 206 249 299 337	7-10 2, 3, 7, 10 2 1, 7 9 1, 2, 11, 19 2, 22 1, 4, 20, 29, 36
Graphs and the Solutions of Equations	050407	116 205 249 271 299 337	3 5 7 5, 12 3, 13, 25 5, 19, 25, 28
Sets, Counting and Probability	180507	90 171 205 249 271 299 337	4, 6, 7 2, 5, 9 1, 3, 6, 8, 12, 13 4, 6, 9, 10, 13, 16-18, 20, 21 1-3, 8-11 4, 6, 7, 11, 14, 16, 17, 19, 20, 24 3, 7, 8, 12, 16, 18, 21, 23, 24, 26, 27, 30, 33, 37, 39
Systems of linear Equations and Matrices	240807	48 69 90 116 171 205 249 271 299 337	1-7 1-6, 11 1, 5, 8, 9, 11-14 1, 4-6, 8 3, 4, 6, 8, 10 2, 4, 11 3, 5, 8, 12, 14, 15 4, 6 1, 8, 15, 18, 21, 23, 28 2, 6, 9, 11, 15, 17, 22, 34, 35, 41
Random variables and their distributions	210907	299 337	5, 9, 10, 12, 26, 27 10, 13, 14, 31, 32, 38, 40