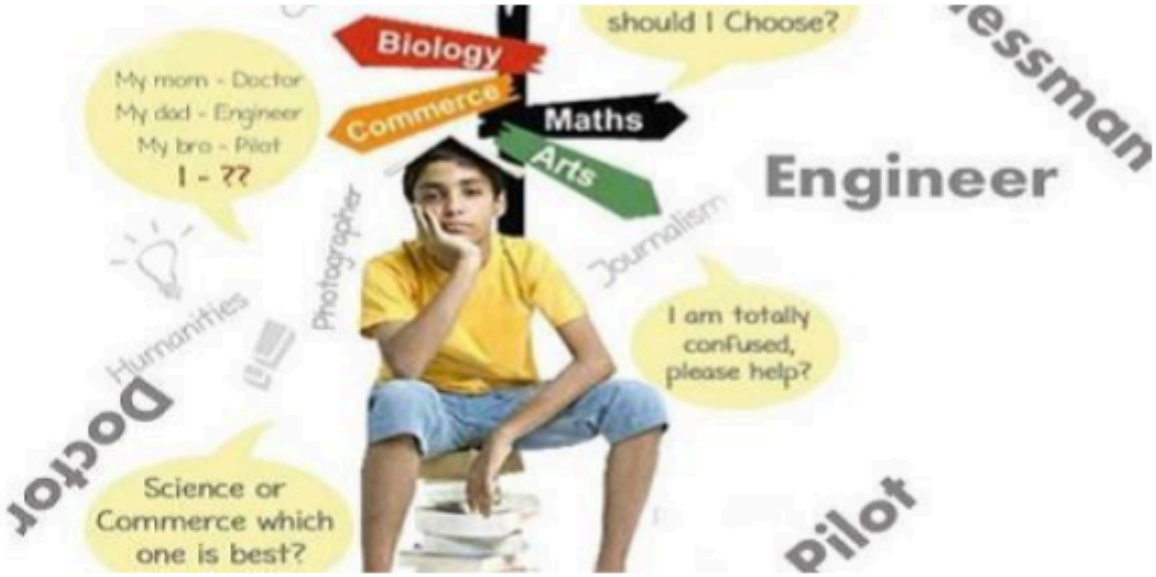
Tāmaki College
EAST AUCKLAND

OPTION BOOKLET 2020



MATHEMATICS DEPARTMENT

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Selecting the Correct Course of Study

Choosing course options that combine student ability, interest, and personality type and employment/study direction is extremely important.

Successful students study courses that combine:

Ability + interest + employment/study direction + keeping options open

Questions You neeD to AnsWer BeFore CHoosinG Your Courses		
How good are you at a subject?	What do you enjoy?	What are you planning to do when you leave school?
Which subjects do you achieve well in?	Do you like the work? Does it match your personality type?	What subjects do you need to take?
How does your teacher rate your ability?	What do you find interesting and of value?	How do you keep your options open?

Careers Advice

The Careers Team is committed to helping young people with that good start—the one that sends them in the right direction and provides the skills, confidence and competence building that is so critical for progress beyond school. long term career prospects are largely determined in the first ten years of working life. subject selection can be difficult when you are not fully informed. in this world of constant change, it is not easy for both parents and students to know the requirements of what subjects to study to support longer term goals/ pathways, and be informed about the changes relating to tertiary courses or training programmes leading to apprenticeships or entry level employment.

if you have any questions regarding this, Tamaki College has a full time Careers Adviser and Guidance Counsellor available. please do not hesitate to contact the Careers office for further information.

Vocational Pathways

Vocational pathways are part of the Government's Youth Guarantee scheme, which is about improving the transition from school to work by providing a wider range of learning opportunities, making better use of the education network, and creating clear pathways from school to work and study. What it means is it helps you plan your journey from learning to earning. Click on the link for detailed information—'Vocational pathways'.

the pathways identify a range of Achievement standards and unit standards that prepare students for ongoing education and/or employment in the industry of their choice. there are six colour coded Vocational pathways as shown on the rosette to the right.

NCEA is intended to act as a learning goal and to encourage lifelong learning. Students will start to earn credits in high school and will continue to build up their credits with a tertiary provider or in the workplace.

Course Endorsement – Merit or Excellence

Obtained if 14 Merit and/or excellence credits (3 internal + 3 external + 8 others) are achieved in a designated course.

Level Endorsement – Merit or Excellence

Obtained if 50 Merit and/or excellence credits are achieved across courses.

NCEA Level 1 (Year 11)

Awarded when 80 level 1 (or higher level) credits are earned. this must include:

- 10 credits in the specified standards that count toward literacy
- 10 credits in specific standards that count toward numeracy

NCEA Level 2 (Year 12)

Awarded when 80 credits are earned – with at least 60 at level 2 + level 1 literacy and numeracy.

NCEA Level 3 (Year 13) (see following page for University Entrance requirements)

Awarded when 80 credits are earned – with at least 60 at level 3 + 20 from level 2 or higher + level 1 literacy and numeracy.

New Zealand Scholarship

new Zealand scholarship is a separate award from NCEA and is assessed by way of external assessment only. the assessments are separate from the level 3 assessments. A new Zealand scholarship is awarded if a student achieves the scholarship standard in three subjects. students can also gain awards in individual subjects. see www.nzqa.govt.nz for more information.

on to Year 12 results are the best possible. there are also monetary scholarships available at some universities when NCEA has been achieved with Merit and/or excellence across all or some NCEA levels. Accommodation Halls accept students based on their Year 12 results and some Halls guarantee a place if NCEA level 2 endorsed with Merit or excellence has been achieved.

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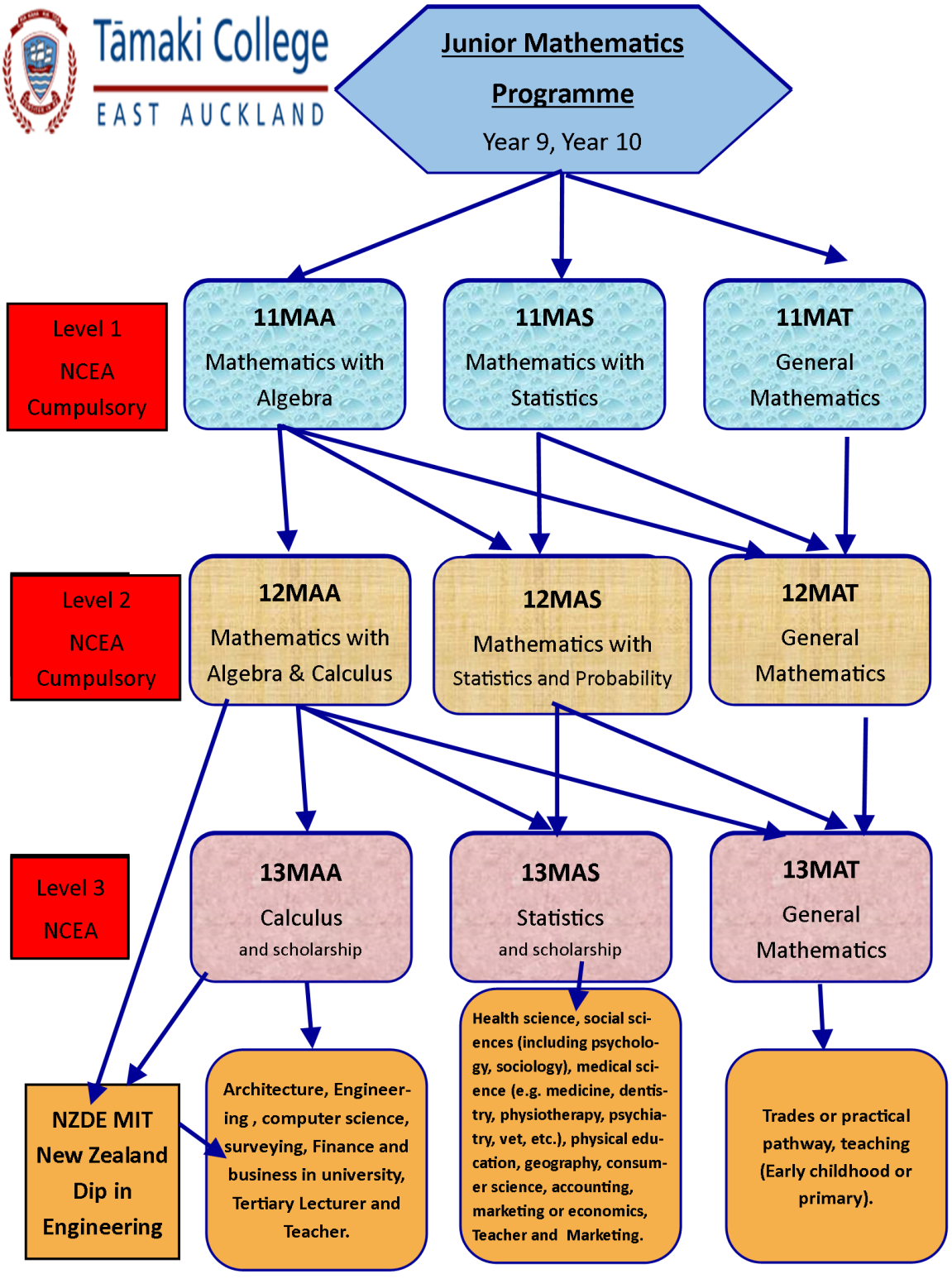

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Mathematics and Statistics: *Pāngarau*

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Junior		Year 11 NCEA level 1	Year 12 NCEA level 2	Year 13 NCEA level 3
Year9 **Mathematics**	**Year10** **Mathematics**	11MAA – Mathematics with Algebra 11MAS – Mathematics with Statistics and Probability. 11MAT – General Mathematics	12MAA – Mathematics with Algebra and Calculus 12MAS – Mathematics with Statistics and Probability. 12MAT – General Mathematics	13MAA - Mathematics with Calculus. 13MAS - Mathematics with Statistics and Probability. 13MAT - General Mathematics

Mathematics and Statistics Year 9 & Year 10 Courses

Students in Year 9 must do Number, Measurement, Algebra, Geometry, Linear Patterns, Statistics and Probability.

Students in Year 10 must do Number, Measurement, Algebra, Geometry, Graphs, Trigonometry and Statistics.

Jumpstart Programme for Year 10s (in Term 4) will include an NCEA level 1 internal 91036 (3cr) - Investigate bivariate numerical data using the statistical enquiry cycle.

Students' numeracy levels will be determined through the E Asttle test, PAT test, topic tests, Examination results and overall teacher judgement.

Please also note that because of the way the courses in Mathematics and statistics branch off in Year 11, the preparation of students in the junior school is important. Some careers require Calculus in level 3 which generally requires success with algebra in Years 9 and 10. Additionally, there are many subjects (e.g. Physics, Chemistry and Economics) that require a high level of mathematics which is best achieved through the 11MAA and 12MAA courses. Be sure to read the prerequisites for these courses and/or discuss with your current mathematics teacher.

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11MAA – Mathematics with Algebra (Level 1)

Prerequisites:	Teachers and HOD (Mrs Singh) will use examination results, standardised testing (e-Asttle, PAT) and overall teacher judgement along with work ethic to identify students who are best suited for this course.
Why this course:	Students are expected to strive for course endorsement in this course. it is recommended that students wishing to study NCEA level 2 or higher levels do this course. Students who are looking to do level 3 Calculus must also do the 11MAA course.
Course information:	Pathway towards Calculus and/or statistics Students studying this course will be expected to achieve Merit and Excellence in all assessments and will be expected to demonstrate a high degree of self-management, including regular completion of homework and study.
Course fees	Graphics calculator

STANDARD	DESCRIPTION	CREDITS	INT/ EXT	LEVEL 1 LITERACY	LEVEL 1 NUMERACY
AS 91026	Apply numeric reasoning in solving problems	4	int	N	Y
AS 91032	Apply right-angled triangles in solving measurement problems	3	int	N	Y
AS 91035	Investigate a given multivariate data set using the statistical enquiry cycle	4	int	Y	Y
AS 91029	Apply linear algebra in solving problems	3	int	N	Y
AS 91027	Apply algebraic procedures in solving problems	4	ext (MCAT)	N	Y
AS 91028	Investigate relationships between tables, equations and graphs	4	ext	N	Y
	Maximum Credits Available	**21**			

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11MAS – Mathematics with Statistics (Level 1)

Prerequisites: Teachers and HOD (Mrs Singh) will use examination results, standardised testing (e-asttle, PAT) and overall teacher judgement along with work ethic to identify students who are best suited for this course.

Why this course: This course is weighted towards internal Assessment. Students who wish to go on to NCEA level 2 and 3 Mathematics, but struggle with Algebra and need additional time to grasp abstract mathematical concepts, should take this course. Students can achieve a course endorsement in this course. However, it is recommended that students who wish to do 12MAS & 12MAT must do this course.

Course information: Pathway towards Statistics and/or General Mathematics.

The majority of students in this course will proceed to either 12MAS or 12MAT course which can lead to level 3 Statistics and/or level 3 Mathematics.

Course cost: Scientific calculator

STANDARD	Description	CREDITS	INT/ EXT	LEVEL 1 LITERACY	LEVEL 1 NUMERACY
AS 91026	Apply numeric reasoning in solving problems	4	int	N	Y
AS 91028	Investigate a situation involving elements of chance	3	int	Y	Y
AS 91035	Investigate a given multivariate data set using the statistical enquiry cycle	4	int	Y	Y
AS 91029	Apply linear algebra in solving problems	3	int	N	Y
AS 91037	Demonstrate understanding of chance and data	4	ext	Y	Y
	Maximum Credits Available	**18**			

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11MAT – General Mathematics

Prerequisites:	Teachers and HOD (Mrs Singh) will use examination results, standardised testing (e-Asttle, PAT) and overall teacher judgement along with work ethic to identify students who are best suited for this course.
Why this course:	Students who struggle to grasp mathematical concepts but understand the need to gain basic numeracy skills for workplace and other academic endeavours.
Course information:	The course is designed to allow students to gain credits towards their NCEA level 1 Certificate and achieve the basic numeracy requirements for NCEA level 1 and university entrance through internally assessed Achievement standards. The topics covered this year are related to mathematics in everyday life and include numeric reasoning, transformation geometry, statistics and linear algebra. Students who are successful in this course may move onto a 12MAT course in the following academic year.
Course cost:	Scientific calculator

STANDARD	DESCRIPTION	CREDITS	INT/ EXT	LEVEL 1 LITERACY	LEVEL 1 NUMERACY
AS 91026	Apply numeric reasoning in solving problems	4	int	N	Y
AS 91034	Apply transformation geometry in solving problems	2	int	N	Y
AS 91035	investigate a given multivariate data set using the statistical enquiry cycle	4	int	Y	Y
AS 91029	Apply linear algebra in solving problems	3	int	N	Y
	Maximum Credits Available	**13**			

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12MAA – Mathematics with Algebra and Calculus. (Level 2)

Prerequisites: 14 level 1 Credits from Achievement standards, including at an Achieved in Algebra AS 91027. If prerequisites are not met, entry may be granted at the discretion of the HOD (Mrs Singh).

Why this course: Students wishing to study Calculus at level 3 must do this course. This course will also be particularly beneficial for students wishing to do scholarship Calculus and a Diploma in Engineering programme at MIT.

Course Information: Pathway towards Calculus and/or Statistics/NZDE program to MIT

This course relies on students' ability to think algebraically, both in manipulating algebraic expressions and solving complex equations. This course is a must for students intending to study level 3 Calculus. Students will need to be solid mathematicians and be expected to display the highest degree of self management. Students who aspire to be engineers or Architect or mathematicians or study courses requiring a high-degree of mathematics should enrol in this course. Newzealand diploma in engineering program to MIT.

Course cost: Graphics calculator

STANDARD	DESCRIPTION	CREDITS	INT/ EXT	UE LITERACY (READING)	UE LITERACY (WRITING)
AS 91259	Apply trigonometric relationships in solving problems	3	int	N	N
AS 91257	Apply graphical models in solving problems	4	int	N	N
AS 91261	Apply algebraic processes in solving problems	4	ext	N	N
AS 91262	Apply calculus methods in solving problems	5	ext	N	N
AS 91256	Apply coordinate geometry methods in solving problems	2	int	N	N
AS 91269	Apply Systems of Equations in Solving Problems	2	int	N	N
	Maximum Credits Available	**20**			

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12MAS – Mathematics with Statistics and Probability (Level 2)

Prerequisites:	10 level 1 Credits in 11MAS or 11MAA. if prerequisites are not met, entry may be granted at the discretion of the HOD (Mrs Singh).
Why this course:	Students with a career path involving medicine, social sciences, journalism, finance, marketing, etc. are advised to take statistics. students who are competent mathematicians and good at writing, but algebra is not a strength and they do not intend on studying level 3 Calculus should take this course. Students studying 12MAS will gain a solid understanding of statistics and modelling and will be well placed for success in a level 3 statistics (13MAS) course.
Course information:	pathway towards statistics This level 2 statistics course uses Achievement standards and leans heavily towards internal assessment. This is a rigorous level 2 Mathematics course and will prepare students for many careers and university courses. Students sitting this course will not be eligible to do Calculus (13MAC) but will be eligible for level 3 statistics (13MAS) and/or Mathematics (13MAT).
Course cost:	Scientific calculator

STANDARD	DESCRIPTION	CREDITS	INT/ EXT	UE LITERACY (READING)	UE LITERACY (WRITING)
AS 91256	Apply coordinate geometry methods in solving problems	2	int	N	N
AS 91264	use statistical methods to make an inference	4	int	N	N
AS 91265	Conduct an experiment to investigate a situation using statistical models	3	int	N	N
AS 91259	Apply trigonometric relationships in solving problems	3	int	Y	N
AS 91267	Apply probability methods in solving problems	4	ext	N	N
AS 91269	Apply Systems of Equations in Solving Problems	2	int	N	N
	Maximum Credits Available	**18**			

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12MAT – General Mathematics (Level 2)

Prerequisites:	10 level 1 Mathematics Credits from 11MAT. If prerequisites are not met, entry may be granted at the discretion of the HOD (Mrs Singh).
Why this course:	Students who find mathematics challenging, but require level 2 Mathematics credits for their pathway will be well suited for the 12MAT course. This course has been designed to deliver Achievement standards in a practical context. Students engaged in trades and/or students whose literacy skill makes a statistics course too challenging should choose this course. Students studying 12MATwill gain a solid understanding of practical mathematical concepts, which will prepare them to study 13MAT at level 3 if they wish.
Course information:	Pathway towards General Mathematics this level 2 practical Mathematics course uses Achievement standards and leans heavily towards internal assessment. Students who need a bit more time to grapple with mathematical concepts and the structure of written responses will be given the opportunity to do so in this course. This is a level 2 Mathematics course and will prepare students for many non-mathematical careers and university courses. Students sitting this course will not be eligible to do Calculus (13MAA) or level 3 statistics (13MAT) but can do level 3 Mathematics (13MAA).
Course cost:	Scientific calculator

STANDARD	DESCRIPTION	CREDITS	INT / EXT	UE LITERACY (READING)	UE LITERACY (WRITING)
			int	N	N
AS 91259	Apply trigonometric relationships in solving problems	3	int	N	N
AS 91260	Apply network methods in solving problems	2	int	N	N
AS 91265	Conduct an experiment to investigate a situation using statistical methods	3	int	N	N
As91256	Apply coordinate geometry methods in solving problems	2	int	Y	N
AS 91258	Apply sequence and series in solving problems	2	int	N	N
AS 91269	Apply systems of equations in solving problems	2	int	N	N
	Maximum Credits Available	**14**			

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13MAA – Calculus & Scholarship (Level 3)

Prerequisite:	14 level 2 Credits from 12MAA including at least Achievement from Algebra 91261, Calculus 91262. If prerequisites are not met, entry may be granted at the discretion of the HOD (Mrs singh).
Why this course:	This course caters to students who are strong mathematicians and are fluent in algebra. Students looking to study mathematics, statistics, sciences (including medical sciences), computer science, surveying, engineering, finance and business in university should be taking level 3 Calculus.
Course information:	This course covers aspects of mathematics such as derivatives, integrals, differential equations, real and complex numbers, conic sections and trigonometric functions.
Course cost:	Graphics calculator

STANDARD	DESCRIPTION	CREDITS	INT/ EXT	UE LITERACY (READING)	UE LITERACY (WRITING)
*AS 91573	Apply the geometry of conic sections in solving problems	3	int	N	N
AS 91575	Apply trigonometric methods in solving problems	4	int	N	N
AS 91574	Apply linear programming methods in solving problems	3	int	N	N
AS 91587	Apply systems of simultaneous equations in solving problems	3	int	N	N
*AS 91577	Apply the algebra of complex numbers in solving problems	5	ext	N	N
AS 91578	Apply differentiation methods in solving problems	6	ext	N	N
AS 91579	Apply integration methods in solving problems	6	ext	N	N
*Optional	**Maximum Credits Available**	**30**			

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13MAS – Statistics & Scholarship (Level 3)

Prerequisites:	10 level 2 Credits from 12MAA or 12MAS. If prerequisites are not met, entry may be granted at the discretion of the HOD (Mrs Singh).
Why this course:	This course caters to students who are mathematically inclined but is also worthwhile for students looking to study the sciences, social sciences (including psychology, sociology), medical science (e.g. medicine, dentistry, physiotherapy, psychiatry, etc.), physical education, geography, consumer science, accounting, marketing or economics. It is accessible to students who may struggle with algebraic thinking but are interested in developing their statistical understanding and literacy.
Course information:	Students will use the PPDAC cycle to investigate the time-series, bivariate and multivariate data. They will also learn about probability theory including various distributions. Students with high literacy skills and the ability to make connections between mathematical concepts and real-world contexts will do well in statistics.
Course cost:	Scientific calculator

STANDARD	DESCRIPTION	CREDITS	INT / EXT	UE LITERACY (READING)	UE LITERACY (WRITING)
AS 91580	Investigate time series data	4	int	N	N
AS 91581	Investigate bivariate measurement data	4	int	N	N
AS 91582	Use statistical methods to make a formal inference	4	int	N	N
AS 91583	Conduct an experiment to investigate a situation using experimental design principles	4	int	N	N
AS 91585	Apply probability concepts in solving problems	4	ext	N	N
*AS 91586	Apply probability distributions in solving problems	4	ext	N	N
*Optional	**Maximum Credits Available**	**24**			

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13MAT – General Mathematics (Level 3)

Prerequisites:	10 level 2 Mathematics Credits. If prerequisites are not met, entry may be granted at the discretion of the HOD (Mrs Singh).
Why this course:	This course caters to students who require level 3 Mathematics credits for their chosen pathway, but do not have the algebraic experience necessary for Calculus or the desire to do statistics. It is designed to complement the General Mathematics course at level 2. This course would be appropriate for students needing level 3 Mathematics credits who may be planning on a trades or practical career pathway.
Course information:	This course caters to students who have had some success in level 2 Mathematics but find mathematics difficult and prefer their mathematics to have practical meaning to the real world.
Course cost:	Scientific calculator

STANDARD	DESCRIPTION	CREDITS	INT / EXT	UE LITERACY (READING)	UE LITERACY (WRITING)
As 91574	Apply linear programming methods in solving problems	3	int	N	N
As 91580	Investigate time series data	4	int	N	N
As 91581	Conduct an experiment to investigate a situation using experimental design principles	4	int	N	N
As 91587	Apply systems of simultaneous equations in solving problems	3	int	N	N
	Maximum Credits Available	**14**			