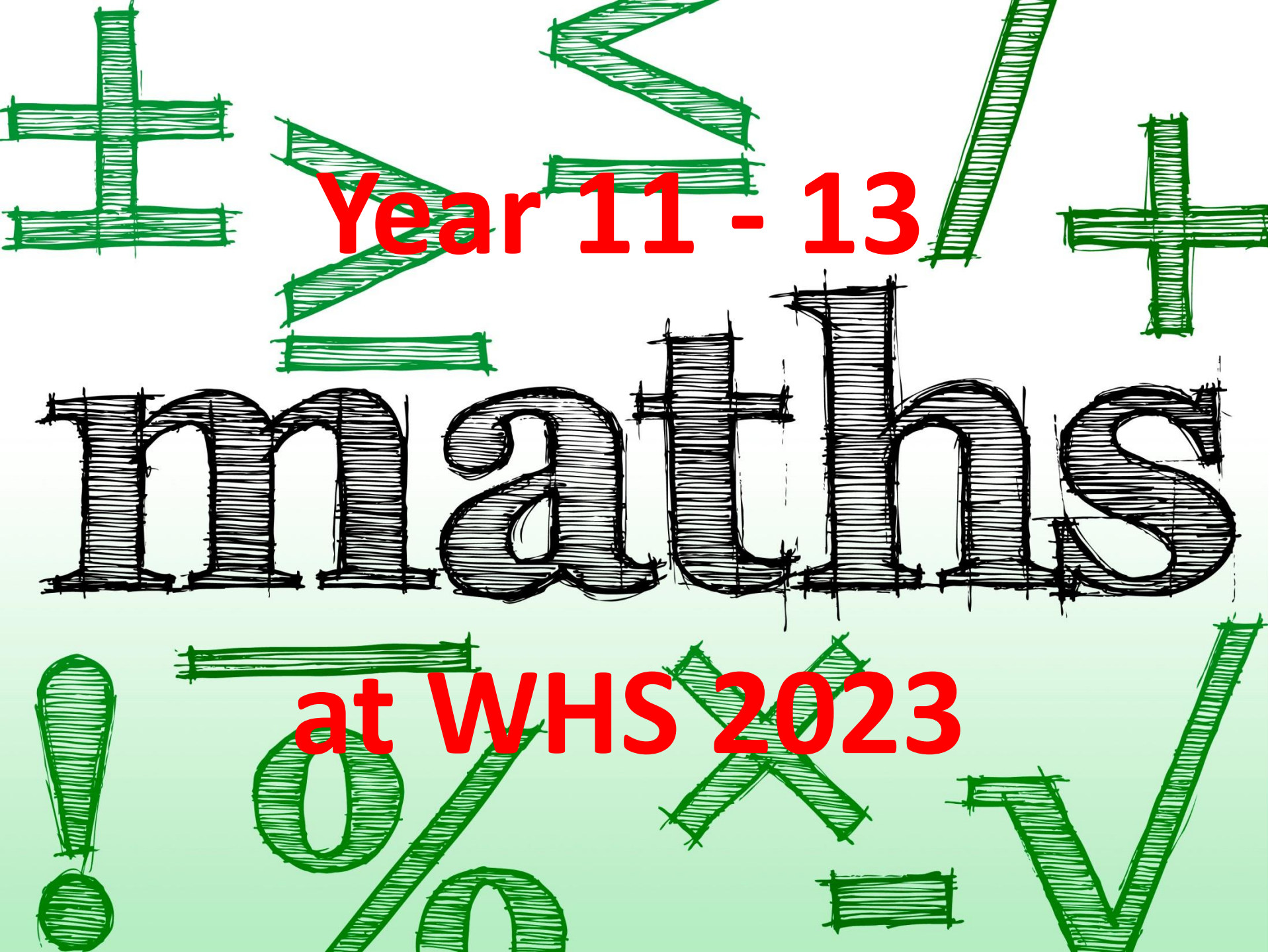

Year 11 - 13
maths
at WHS 2023

NCEA Level 1

MAT123 – Mathematics

MAT012 – Mathematics

NUM112 / SNE112 / ATM112 – Numeracy

NCEA Level 2

MAT123 – Mathematics

FIN223 – Finance

Year 11 2023

Aim - to get a minimum of 10 numeracy credits **in Maths**:

Option 1 - Numeracy NUM112 or Arotahi ATM112 (SNE112)

These are the courses for students who were not entered for the Numeracy Pilot this year

- If you find maths challenging, just want to get your 10 numeracy credits and probably don't want to do Maths in year 12, this is the course you should choose.
- In this course, students collect evidence of number, measurement and statistics skills towards a portfolio. No tests.
- It may also include some Finance standards.
- You would be able to do a Finance course at L2 in year 12 if you achieved L1 numeracy.

Option 2 - Mathematics MAT012

This is a one-off course for students who sat the numeracy pilot, but whose teachers think that they would struggle to cope with a self-directed achievement standard course. This will be class taught and will include Number, Measurement and Statistics standards. There may be the option of an external assessment as well. Good attendance will be essential.

Option 3 - Mathematics MAT123

This is the course for everyone else. It will involve achievement standards from the Maths and Statistics curriculum. It is a self-directed course where students choose their own standards and work independently. Students should be aiming to get a minimum of 10 credits, but probably between 12 and 16, **from at least 4 standards**, especially if you want to carry on with Maths in year 12.

Year 10 caregivers will receive an email shortly with the course that their teacher recommends for them for 2023

Year 12 2023

No further numeracy requirement (including for UE)

YOU DO NOT NEED TO DO MATHS IN YEAR 12 - however, it is a useful subject for a lot of career pathways

Option 1 - Mathematics MAT123

Option 2 – Finance FIN223

You can do this **instead of** MAT123 or **as well as** MAT123

It involves financial management standards covering personal income, taxation, budgeting, insurance, banking and financial goal setting

10 Level 2 credits are on offer but they DO NOT count towards Level 1 Numeracy

Why we have introduced MAT123:

- Variety of learning styles - videos, workbooks, worksheets, tutorials etc.
- Students can work at their own pace
- Students can get help from 2 or 3 teachers any lesson
- Students are not “pigeon-holed” too early - time to develop
- Students have a choice of standards
- Students have a choice of levels - year 11s can do some at level 2 and year 12s can choose some at level 3.
- Students do assessments when ready, not at a set time so results should improve.
- Second assessment opportunity
- Students with poor attendance can still succeed, even if in fewer standards
- Absence for assessments not a problem - no longer need medical certificates
- Students on trips don’t have to rearrange assessments
- Students write some of their own assessments - more buy-in
- Student well-being - can change things to fit personal circumstances
- Students become self-directed learners

Mathematics and Statistics Matrix

Level 1	Level 2	Level 3
AS91026 **1.1** Apply numeric reasoning in solving problems 4 credits Internal	AS91258 **2.3** Apply sequences and series in solving problems 2 credits Internal	AS91576 **3.4** Use critical path analysis in solving problems 2 credits Internal
AS91027 **1.2** Apply algebraic procedures in solving problems 4 credits External (CAT)	AS91259 **2.4** Apply trigonometric relationships in solving problems 3 credits Internal	AS91587 **3.15** Apply systems of simultaneous equations in solving problems 3 credits Internal
AS91028 **1.3** Investigate relationships between tables, equations and graphs 4 credits External	AS91261 **2.6** Apply algebraic methods in solving problems 4 credits External	
AS91029 **1.4** Apply linear algebra in solving problems 3 credits Internal	AS91262 **2.7** Apply calculus methods in solving problems 5 credits External	
AS91030 **1.5** Apply measurement in solving problems 3 credits Internal	AS91263 **2.8** Design a questionnaire 3 credits Internal	
AS91032 **1.7** Apply right-angled triangles in solving measurement problems 3 credits Internal	AS91264 **2.9** Use statistical methods to make an inference 4 credits Internal	
AS91036 **1.11** Investigate bivariate numerical data using the statistical enquiry cycle 3 credits Internal	AS91267 **2.12** Apply probability methods in solving problems 4 credits External	
AS91037 **1.12** Demonstrate understanding of chance and data 4 credits External		
AS91038 **1.13** Investigate a situation involving elements of chance 3 credits Internal		

Year 13 – NCEA Level 3

MAC335 – Calculus

MAS335 – Statistics

MAT335 – Mathematics

FIN330 – Finance

MAC335 - Calculus

	Standard Name	Number of Credits	Internal/ External	L/N
AS 91575	Apply trigonometric methods in solving problems	4	I	N
AS 91577	Apply the algebra of complex numbers in solving problems	5	E	N
AS 91578	Apply differentiation methods in solving problems	6	E	N
AS 91579	Apply integration methods in solving problems	6	E	N
	Total credits available	**21**		

Prerequisites

Credits from 3/4 Level 2 standards including AS91262 (2.7 external) and **merit** in AS91261 (2.6 external)

Scholarship is available in this subject

Graphical calculators are highly recommended

Calculus is a UE domain. 14 credits from this course count toward UE

MAS335 - Statistics

	Standard Name	Number of Credits	Internal/ External	L/N
AS 915803.8	Investigate time series data	4	I	L/N
AS 915813.9	Investigate bivariate measurement data	4	I	L/N
AS 915823.10	Use statistical methods to make a formal inference	4	I	L/N
AS 915853.13	Apply probability concepts in solving problems	4	E	N
AS 915863.14	Apply probability distributions in solving problems	4	E	N
	Total credits available	**20**		

Prerequisite

Credits from 3/4 Level 2 standards including AS91267 (2.12 external) and AS91264 (2.9 internal)

Scholarship is available in this subject

A laptop/chrome book is **ESSENTIAL** for this course

Statistics is a UE domain. 14 credits from this course count toward UE

MAT335 - Mathematics

	Standard Name	Number of Credits	Internal/ External	L/N
AS 91574 3.2	Apply linear programming methods in solving problems	3	I	N
AS 91576 3.4	Use critical path analysis in solving problems	2	I	N
AS 91581 3.9	Investigate bivariate measurement data	4	I	L/N
AS 91583 3.11	Conduct an experiment to investigate a situation using experimental design principles	4	I	L/N
AS 91585 3.13	Apply probability concepts in solving problems	4	E	N
AS 91597 3.15	Apply systems of simultaneous equations in solving problems	3	I	N
	Total credits available	**20**		

Prerequisites

Credits from 3/4 Level 2 standards including AS91267 (2.12 external).
and AS91264 (2.9 internal)

A laptop/chrome book is **ESSENTIAL** for this course

Mathematics is a UE domain. 14 credits from this course count toward UE

FIN330 - Finance

Standard Name		Number of Credits	Internal/ External	L/N
US28098	Evaluate options to increase personal income	3	I	N
US28099	Analyse credit options and select strategies to manage personal finances	3	I	N
US28100	Develop a plan to achieve a long-term personal financial goal(s)	4	I	N
US28104	Analyse the impact(s) of external factors on personal finances	3	I	N
US9681	Contribute in a team or group that has an objective	3	I	N
	Total credits available	**16**		

Prerequisites

Numeracy at Level 1

A laptop/chrome book is **ideal** for this course

16 credits from this course count toward Level 3 BUT NOT towards UE

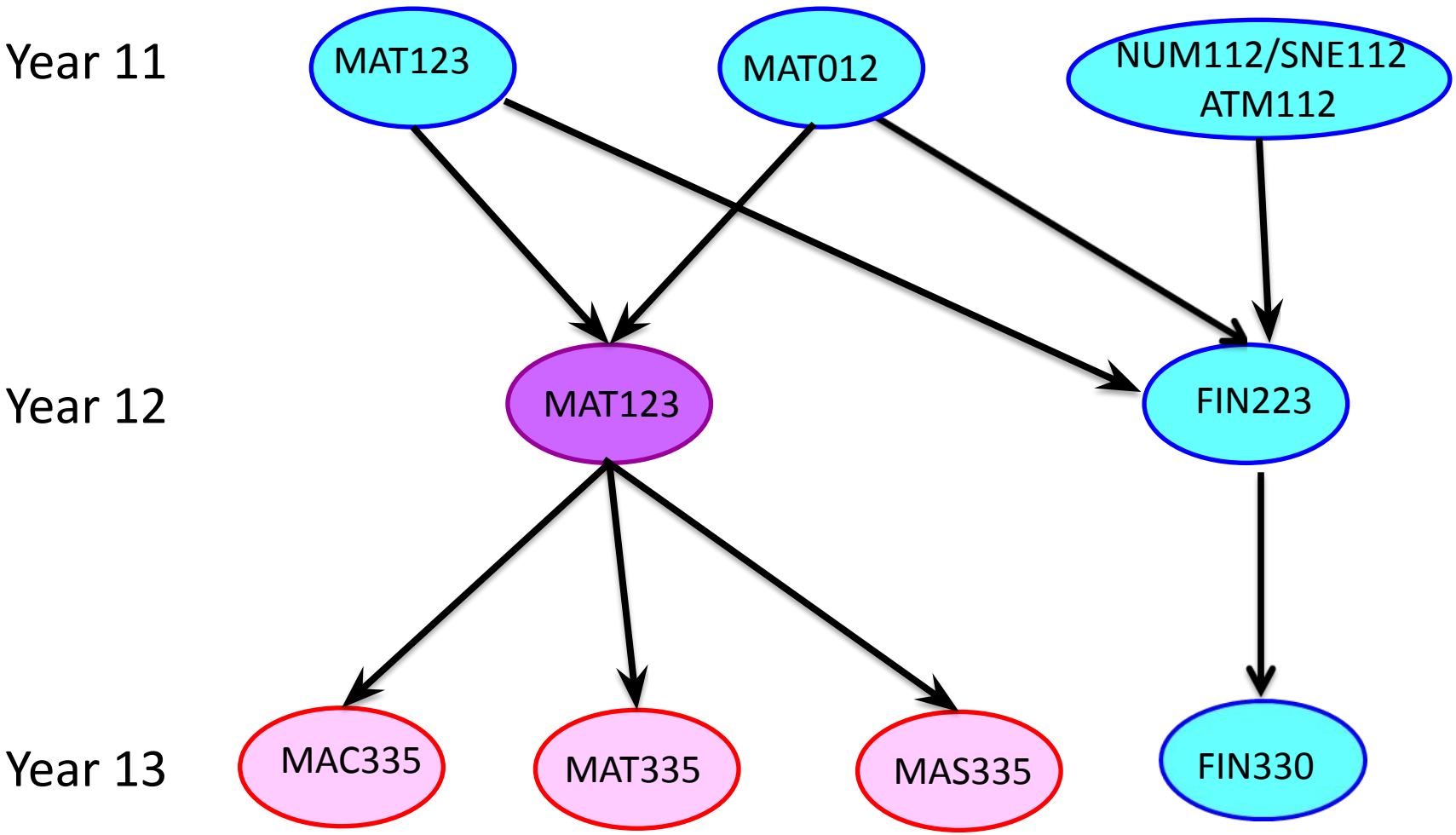
Careers/university courses

TE WHARE WĀNANGA O TE ŪPOKO O TE IKA A MĀUI
VICTORIA
UNIVERSITY OF WELLINGTON

Planning ahead—choosing school subjects

Strongly recommended	Recommended	Extra information
Bachelor of Architectural Studies		
▪ Calculus ▪ Physics ▪ Statistics	▪ English-rich subjects*	▪ If you do not have 14 NCEA Level 3 credits (or equivalent) in two of Calculus, Statistics or Physics, you will need to take SARC 122 (Introduction to Applied Physics, Numerical Methods and Statistics for Designers). ▪ No portfolio is required.
Bachelor of Building Science		
▪ Calculus ▪ Statistics ▪ Physics	▪ English-rich subjects* ▪ Subjects in creative areas such as arts, Design or Graphics ▪ Technology	▪ If you do not have 14 NCEA Level 3 credits (or equivalent) in two of Calculus, Statistics or Physics, you will need to take SARC 122 (Introduction to Applied Physics, Numerical Methods and Statistics for Designers). ▪ No portfolio required.
Bachelor of Commerce		
	▪ Accounting ▪ Economics ▪ English-rich subjects* ▪ Statistics	▪ All majors in the BCom offer introductory courses and can be started at Victoria University.

Mathematics Faculty - PATHWAYS



All year 13 courses have prerequisites

"I wish we hadn't learned probability
'cause I don't think our odds are good."

MATHEMATICS IS THE MOST BEAUTIFUL AND MOST POWERFUL CREATION OF THE HUMAN SPIRIT.

Stefan Banach

"NO OFFENSE, MISS MYERS, BUT THIS 'ALGEBRA' IDEA OF YOURS IS NEVER GOING TO CATCH ON!"

"I'd like to meet you halfway, but I'm terrible with fractions."

Good Mathematicians

EYES: Infer.
Good mathematicians **LOOK** for clues to draw logical conclusions, make predictions before solving, and more.

HEAD: Think.
Good mathematicians monitor their own **THINKING** when solving math problems.

NOSE: Importance.
Good mathematicians **SNIFF OUT** important information and details.

MOUTH: Questions.
Good mathematicians ask **QUESTIONS** before, during, and after problem solving.

HEART: Visualize.
Good mathematicians **LOVE** to visualize a word problem in action.

HANDS: Synthesize.
Good mathematicians **PUT IT ALL TOGETHER** to determine what a question is asking and how to solve it.

STOMACH: Schema.
Good mathematicians are **HUNGRY** to find connections between a problem they are solving and things they already know.

WAIST: Purpose.
Good mathematicians don't **WASTE** time…they determine their purpose, choose a strategy, and solve.

KNEES: Monitor Comprehension.
Good mathematicians know they **NEED** to fully understand what a question is asking, and know what to do when they don't.

FEET: Text Structure.
Good mathematicians **FIRMLY** understand the elements of a word problem and use it to help them choose a strategy.

NUM112/NUM212/ATM112

Standard Name		Number of Credits	Internal/ External	L/N
US 26623	Use numbers to solve problems	4	I	N*
US 26626	Interpret statistical information in context	3	I	N*
US 26627	Use measurement to solve problems	3	I	N*
	Total credits available	**10**		

* These standards only contribute to numeracy when **ALL** of them have been achieved

Standard Name		Number of Credits	Internal/ External	L/N
US 24697	Perform income-related calculations for personal financial capability	2	I	
US 24709	Produce a balanced budget to manage personal finances	3	I	
	Total credits available	5		

Strongly recommended	Recommended	Extra information
Bachelor of Engineering (with Honours)		
Electronic and Computer Systems Engineering		▪ MATH 132 is offered as an introductory course in Trimester 3 for students without a background in Mathematics (preferably Calculus).^ ▪ PHYS 122 is offered as an introductory course in Trimester 1 for students without a background in Physics.
▪ Calculus ▪ Physics	▪ Digital Technologies ▪ Economics ▪ Science ▪ Statistics	
Software Engineering and Network Engineering		
▪ Mathematics (preferably Calculus)	▪ Digital Technologies ▪ Economics ▪ Physics ▪ Science ▪ Statistics	
Bachelor of Design Innovation		
If you wish to include a minor in Computer Science (for computer graphics) ▪ Mathematics (preferably Calculus)	▪ Digital Technologies ▪ English-rich subjects* ▪ Subjects in the creative areas such as Art, Design and Graphics.	▪ If you don't have 14 credits at NCEA Level 3 (or equivalent) in an English–rich subject*, you will take an academic writing course (WRIT 101 or WRIT 151). ▪ MATH 132 is offered as an introductory course in Trimester 3 for students wanting to study Computer Graphics without a background in Mathematics (preferably Calculus).^ ▪ Portfolio not required.

Strongly recommended	Recommended	Extra information
Bachelor of Science		
Depending on your proposed major/s (see right): ▪ Calculus ▪ Chemistry ▪ Physics	Depending on your proposed major/s: ▪ Biology ▪ Geography ▪ Science ▪ Statistics	▪ You should take Level 3 (or equivalent) Chemistry if you want to study Biotechnology, Cell and Molecular Bioscience or Chemistry. ▪ You should take Level 3 (or equivalent) Calculus if you want to study Actuarial Science, Applied Physics, Computer Science Electronic and Computer Systems, Geophysics, Mathematics or Physics. ▪ You should take Level 3 (or equivalent) Physics if you want to study Applied Physics, Electronic and Computer Systems, Geophysics or Physics. You should also have a background in Calculus for these subjects. ▪ CHEM 191 and MATH 132 are offered as introductory courses in Trimester 3 for students without a background in these subjects.^ ▪ PHYS 122 is offered as an introductory course in Trimester 1 for students without a background in Physics.
Bachelor of Tourism Management		
	▪ Accounting ▪ Economics ▪ English-rich subjects* ▪ Geography ▪ Languages ▪ Statistics	