LEVEL 1 MATHEMATICAL & SCIENTIFIC INVESTIGATION
1MSCI

What is this course about?

This is a broad, foundational **connected** course offering students the opportunity to experience learning activities spanning all the major strands of mathematics and science. From statistics to algebra, biology, chemistry & physics as well as current issues such as climate change and epidemiology. Students will develop their ability to use their scientific, maths, statistics and thinking skills to solve problems in biological, chemical and physical contexts. There are plenty of opportunities to achieve NCEA numeracy and success in this course will enable students to pursue any of our science, mathematical or statistical courses in levels 2 and 3.

What sort of things will I do?

Throughout this course you will work in practical contexts to deepen your understanding wherever possible. You will observe exponential, quadratic and linear patterns in a variety of scientific contexts providing deep and authentic learning in both mathematics and science.
You will carry out practical investigations, such as fair testing, identifying and classifying, modelling and pattern seeking, to collect authentic data to allow the mathematical analysis.
You will use technology such as spreadsheets and data loggers to investigate these real world situations and understand how you can use mathematics and statistics to describe what you see and take it into account when making choices and decisions.
You will carry out research into a scientific issue.

In Term 1 you might carry out simple Chemistry acid-base experiments involving concentrations and solutions and use Number skills to analyse and understand the effects of climate change on Earth.
In Term 2, you might use Multivariate Analysis skills to compare variation both within and between species of plant and animal life and learn how this variation comes about from our DNA.
In Term 3, you might explore how changes in mechanics affect motion or energy of objects and use Bivariate Analysis skills to analyse and predict the optimum conditions for purpose.

What standards can I enter?

Mathematics (red) & Science (green) Standards available

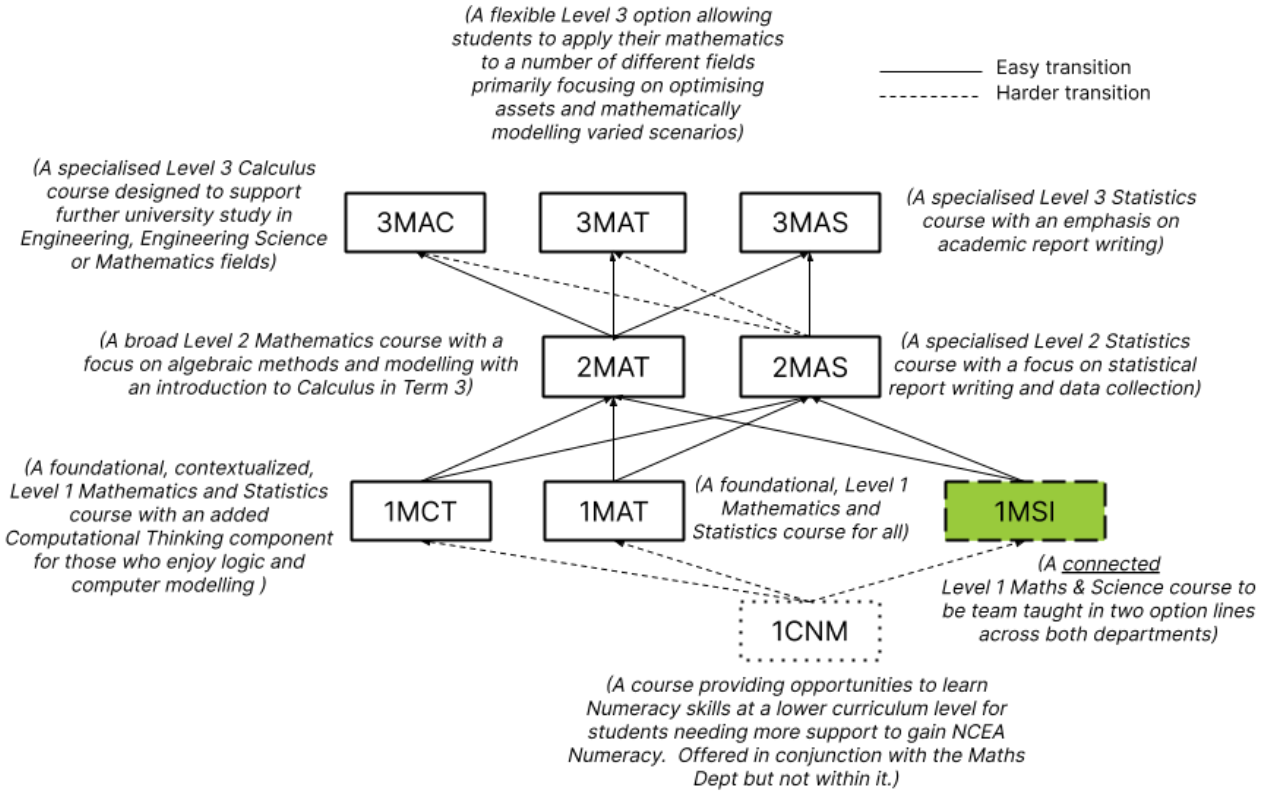
NCEA Level	Standard	Title	Version Number	Credits	Assessment
TERM 1 - Acids & Bases					
1	AS90930	Carry out a practical chemistry investigation, with direction		4	Internal (Investigation) N
1	AS90944	Acids and Bases		4*	External
1	AS91026	Apply numeric reasoning in solving problems	3	4	Internal (Investigation) N
TERM 2 - Survival & Variation					
1	AS90925	Carry out a practical investigation in a biological context, with direction		4	Internal (Investigation) N
1	AS90926	Report on a biological issue		3	Internal (Research & Presentation) L
1	AS90948	Demonstrate understanding of biological ideas relating to genetic variation		4*	External L
1	AS91035	Investigate a given multivariate data set using the statistical enquiry cycle	3	4	Internal (Investigation) N, L
1	AS91028	Investigate relationships between tables, equations & graphs	3	4	External N
TERM 3 - Physics in context					
1	AS90935	Carry out a practical physics investigation that leads to a linear mathematical relationship, with direction		4	Internal (Investigation) N
1	AS90940	Demonstrate understanding of aspects of mechanics		4*	External N
1	AS91036	Investigate bivariate numerical data using the statistical enquiry cycle	3	3	Internal (Report) N
1	AS91029	Apply linear algebra in solving problems	3	3	Internal (Report) N
			TOTAL	**45**	

* = you will choose 1 or 2 of these externals to sit in the end of the year exams

How does this course fit in?

Since so many of the standards overlap, this course cannot be taken in conjunction with 1SCI, 1SCE, 1MAT, or 1MCT.

It will prepare students for study in any discipline of Mathematics or Science and will be taught in 2 option lines.



Frequently asked questions

What calculator will I need?
The Casio FX9750GII Graphical Calculator is recommended. Students using only a basic scientific calculator will be significantly disadvantaged since NZQA assumes that all students have access to graphics calculators. Graphical calculators are normally available for about $100 at the beginning of the year.

Are there any further assessment opportunities (reassessments) for standards assessment in this course?
There will be a suggested timeframe for assessment of each internal standard (shown above) and students are encouraged to work in partnership with their teacher to agree a date that works for them within this timeframe. Students and teachers will work together to ensure that students sit the assessment when they are best equipped to demonstrate their best work and so it is hoped that there is no need to reassess by design.

What happens if I miss an internal assessment?

- If you know in advance that you can't sit your assessment on the day you have agreed (or at your earliest opportunity) you should talk to your teacher at the earliest opportunity about finding a new date within the assessment window.
- If you miss an assessment completely, you must submit a "Missed Assessment" form and try to arrange an alternative assessment date approved by the specialist subject leader. Approval will only be given if the requirements of the missed assessment policy are met, it is practical for the assessment to be done at another time and that other time is before the final grades are returned to students.

Will I be doing all standards in the course?

- Yes, initially you will be entered for all standards in the core course for tracking and stock-taking purposes however as the year progresses and your goals develop you may decide to withdraw from any of them creating an individual MAP for personalised provision.
- We do not offer replacements though so be aware that removing yourself from any standard will reduce the number of credits available to you and may result in no endorsements or university entrance being unavailable.

Subject requirements for assessment authenticity

Students will sign an authenticity statement at the beginning of the assessment verifying that they will abide by the assessment conditions described on the paper. This includes only submitting your own work and refraining from detailed discussion of the assessment task with other students until results are published. This behaviour can weaken the security of the assessment task itself and will result in both your grade, and that of the person you are talking to being reviewed and possibly removed.

Teachers will use the schools breach of authenticity procedures if in any doubt. [NOTE: Inauthentic work is often a result of unclear assessment conditions, copying from another person or public source, too much guidance from a teacher, parent or tutor or sharing work with other students].