LAVALLA
CATHOLIC COLLEGE

Area of Study

Mathematics

2022 Handbook

Contents

Why study Mathematics?

Mathematics is a compulsory Year 10 subject. Students will continue with Year 10 Mathematics A and B and those wishing to undertake VCE Mathematical Methods in Year 11 are strongly recommended to choose the elective "Introduction to Maths Methods" as an additional Maths subject in Year 10.

Foundation mathematics may also continue to Unit 3 and 4 with new VCE Mathematics Curriculum due to be implemented in 2023.

Students are encouraged to research the different mathematics available and consider if it is suitable for their pathways. All further study and career pathways benefit from sound command of Mathematics – so which is the right one for you?

Studies in Mathematics develop skills in:

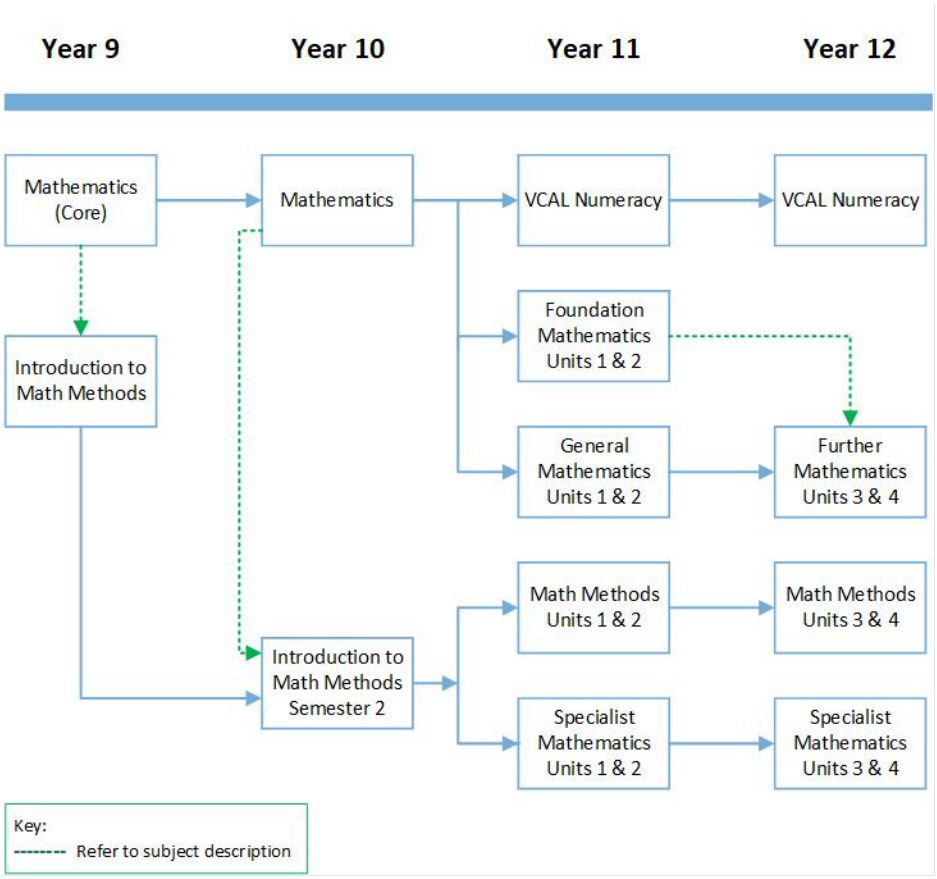
- Hypothesising and Problem posing
- Estimating
- Critical thinking
- Investigating
- Modelling and problem solving
- Reasoning
- Use of technology to represent data and numbers
- Communication

It also develops attitudes of perseverance, diligence and problem solving whilst providing a framework of thinking.

Other resource that may be useful after reading this handbook;

- Web based; https://delta.vtac.edu.au/CourseSearch/prerequisiteplanner.htm Go to the website, type the name of the mathematics you are interested in to see what university courses require which mathematics as a prerequisite.
- Staff: College careers counsellors (Careers@lavalla.vic.edu.au) and Mathematics staff (contact names are in this handbook or talk to your mathematics teacher)

Pathway Information:



Year 10 Curriculum

Where does Mathematics lead to?

Year 10 Mathematics leads to VCE courses in:

1. VCAL Numeracy
2. VCE Foundation Mathematics
3. VCE General Mathematics
4. VCE Mathematical Methods
5. VCE Specialist Mathematics.

Entrance into a particular VCE Mathematics pathway will be based on the recommendations of the Year 10 subject teachers.
This recommendation will be based on the student's mathematical ability as demonstrated in various assessment opportunities throughout the course of the subject in Year 10 combined with the subjects teacher's judgement.

Mathematics A and B
Semester: Semesters 1 and 2
Teacher: Mr Williams

Pathways:
All Year 10 students will study Mathematics A and B for 2 semesters. Students will be prepared for VCE General Mathematics or VCE Foundation Mathematics by completing Mathematics A and B in Year 10.

Students wishing to study Mathematical Methods or Specialist Mathematics at VCE are recommended to complete Year 10 Mathematics A in Semester 1 and Mathematics B in Semester in conjunction with the elective Introduction to Mathematical Methods in Semester 2.

Course Content:
Study in this subject consists of the areas of study: Measurement, Trigonometry, Finance, Probability Linear Algebra and Statistics.

During Year 10 students will become proficient in the use of a summary book and will complete regular skills practice, according to their needs. Evidence of competence in this unit will be demonstrated through regular assessment tasks.

Assessed Coursework:
During this Unit, student progress could be monitored and assessed using:

- Tests
- Exams
- Hurdle Tasks

Additional Information:
Teachers of this subject will make recommendations for the student's progression into VCAL Numeracy, VCE Foundation Maths, General Mathematics or Mathematical Methods. This recommendation will be based on the student's mathematical ability as demonstrated in various assessment opportunities throughout the course of the subject in Year 10 combined with the subjects' teacher's judgement.

Induction to Mathematical Methods (Elective)

Semester: Semester Long (Semester 2)
Teacher: Ms Murrell or Mrs Sutton

Pathways:
VCE Units 1 and 2 Mathematical Methods or Specialist Maths Units 1 and 2

Recommended Previous Studies:
Year 10 Mathematics A

Note: Students are encouraged to seek recommendation from their Year 9 Mathematics teacher and/or Mathematics staff at the Kildare Campus prior to enrolling in this subject.

This subject is an elective that is to be completed in conjunction with Year 10 Mathematics B for those students wishing to enter the Year 11 Mathematical Methods and Specialist Mathematics pathway.

Course Content:
Study in this subject consists of the areas of study: Quadratics, Surds and Linear Equations. Some assumed skills and knowledge is required in the areas of linear algebra, inverse operations, factorising, trigonometry, Pythagoras' theorem, plotting Cartesian coordinates and working diligently with directed numbers.

During Year 10 students will become proficient in the use of a summary book and will complete regular skills practice, according to their needs. Evidence of competence in this unit will be demonstrated through regular and varied assessment tasks.

CAS calculator use is integrated throughout the course.

Additional Information:
This Unit is strongly recommended for students wishing to enrol in VCE Mathematical Methods at Year 11 and 12. Mathematical Methods may lead to the study of a university and/or TAFE course such as computer science, health sciences, general sciences, sport sciences, medicine or engineering and many more. Students are encouraged to use https://delta.vtac.edu.au/CourseSearch/prerequisiteplanner.htm to research what University courses require Mathematical Methods as a prerequisite. They are also encouraged to speak to the Careers advisors about career pathways.

Teachers of this subject will make recommendations for the student's progression into VCE Mathematical Methods Units 1 and 2 and Specialist Maths Units 1 and 2. This recommendation will be based on the student's mathematical ability as demonstrated in various assessment opportunities throughout the course of the subject in Year 10 combined with the subjects' teacher's judgement.

Student wishing to study VCE Specialist Mathematics must also enrol in VCE Mathematical Methods. Study in Mathematical Methods requires a higher level of Mathematical skills.

VCAL Numeracy please refer to VCAL Handbook.

VCE Curriculum, Year 11

Foundation Mathematics Units 1 and 2

Semester: Semesters 1 and 2
Teacher: Mr Eagle

Pathways:
Foundation Mathematics Units 3 and 4 may be available in 2023 due to a new study design being released in 2023. See Mr Williams for further information.

Post-secondary Education: Foundation Mathematics may be suitable for commencement of TAFE level / Studies.

Employment examples: Foundation Mathematics may be suitable for commencement of an Apprenticeship or Traineeship.

Students could access Unit 3 and 4 Further Mathematics if a bridging course is completed at the end of Unit 1 and 2.

Note:
Students are recommended to discuss their suitability for VCE Foundation Mathematics with their Year 10 Mathematics teacher.

Recommended Previous Studies:
Year 10 Mathematics A and B.

Course Content:
Foundation Mathematics provides the continuing Mathematical development of students entering VCE, who need basic mathematical skills to support other VCE subjects, including VET studies.

In Foundation Mathematics there is a strong emphasis on using Mathematics in practical contexts relating to everyday life, recreation, work and study. These units will be especially useful for students undertaking VET studies.
Students are encouraged to use appropriate technology in all areas of their study.

The areas of study for Units 1 and 2 of Foundation Mathematics are 'Space, shape and design', 'Patterns and number', 'Data' and 'Measurement'. Students will study a variety of areas of personal interest and access and develop mathematical skill through this. Mathematical concepts taught in context will include geometry, number operations, number patterns, fractions, collecting and analysing data and measurement.

Assessed Coursework:

During this Unit, student progress could be monitored and assessed using:

- Common Assessment Tasks (CAT's)
- Exams
- Hurdle Tasks could consist of Assignments, Homework Tasks and Application Tasks

Additional Information:

Foundation Mathematics is only available at Units 1 and 2 in 2022 but may have Units 3 and 4 available in 2023 with the new study design and does not provide a pre-requisite for university entry. Foundation Mathematics is compatible with a VCAL pathway at Years 11 and 12 in 2022 and this may change in 2023.

General Mathematics Units 1 and 2

Semester: Semesters 1 and 2
Teacher: Mr Williams

Note:
Students are recommended to discuss their suitability for VCE General Mathematics Units 1 and 2 with their Year 10 Mathematics teacher.

Students are encouraged to use https://delta.vtac.edu.au/CourseSearch/prerequisiteplanner.htm to research what University courses require Further Mathematics as a prerequisite. They are also encouraged to speak to the Careers advisors about career pathways.

Pathways:
Further Mathematics Units 3 and 4

Post-secondary Education: Accounting, Architecture, Commence, Economics, Nursing, Science, Agriculture Science, Agri-business, Business Management, Aviation, Construction Management, Information Technology, Building Design, Defence and etc.

Employment examples: Business Manager, Small Business Owner, Accountant, Financial Advisor, Economist, Nurse, Scientist, Teaching, Defence Forces, State and Federal Police, Community Service, Paramedic, Architect or Draftsperson.

Recommended Previous Studies:
Year 10 Mathematics A and B.
Students electing to complete General Mathematics together with Campus VET subjects are recommended to discuss this with Ms Nelson, or Mrs Brown (Senior Learning Programs Coordinator).

Course Content:
General Mathematics Units 1 and 2 consists of the following topics: Statistics, Matrices, Networks, Recurrence Relations, Finance and Linear Graphs. It involves learning a number of mathematical modelling and problem-solving techniques (with and without CAS technology). It develops a student's ability to select and justify the selection of a technique, apply it accurately and then interpret the results in a range of contexts of increasing complexity.

Assessed Coursework:
During this Unit, student progress could be monitored and assessed using:

- Common Assessment Tasks (CAT's)
- Exams
- Hurdle Tasks

Hurdle tasks could consist of Assignments, Homework Tasks and Application Tasks

Additional Information
Students need a Ti Nspire CX CAS calculator.

Mathematical Methods Units 1 and 2

Semester: Semesters 1 and 2
Teacher: Ms Murrell

Note:
Students are recommended to discuss their suitability for VCE Math Methods Units 1 and 2 with their Year 10 Introduction to Math methods teacher.

Entrance to this subject is based on the satisfactory completion of Introduction to Math Methods in year 10 and teacher recommendation.

Students are encouraged to use https://delta.vtac.edu.au/CourseSearch/prerequisiteplanner.htm to research what University courses require Mathematical Methods as a prerequisite. They are also encouraged to speak to the Careers advisors about career pathways.

Pathways:
Mathematical Methods Units 3 and 4
Further Mathematics Units 3 and 4

Post-secondary Education: Engineering, Computer Science, Medicine, Biomedicine, Dentistry, Veterinary Science, Accounting, Commence, Information Technology, Aviation, Nanotechnology, Radiography, Pharmacy, Science, Applied Science, Environments and etc.

Employment examples: Engineer, Surveyor, Pilot, Geophysicists, Medical Practitioner, Computer Programmer, Biochemist, Naval Architect, Meteorologist, Optometrist, Psychiatrist, Quantity Surveyor, Mathematics Teacher, Astronomer, Financial Advisor, Actuary, Army/Navy/Air Force Officer.

Recommended Previous Studies:
Year 10 Mathematics A+B and Introduction to Math Methods

It is strongly recommended that students do not undertake a VET course whilst they are studying Mathematical Methods.

Course Content:
Each Unit is one semester in length and each Unit is independently assessed. The areas of study for Units 1 and 2 are Functions and graphs (including power functions, logarithmic functions, exponential functions and circular functions), Algebra, Calculus and Probability and Statistics.

Students select and use the numerical, graphical, symbolic and statistical functions of CAS technology to develop mathematical ideas, produce results and conduct analyses requiring problem solving, modelling or investigative techniques.

VCE Mathematical Methods Units 1 and 2 are intended as preparation for Mathematical Methods Units 3 and 4. It is also intended for students interested in pursuing mathematical studies at a higher level.

Assessed Coursework:

During this Unit, student progress could be monitored and assessed using:

- Common Assessment Tasks (CAT's)
- Exams
- Hurdle Tasks

Hurdle tasks could consist of Assignments, Homework Tasks and Application Tasks

Additional Information:

Students will need a Ti Nspire CX CAS calculator. VCE General Mathematics Units 1 and 2 may be taken in conjunction with Mathematical Methods Units 1 and 2.

Students completing Unit 1 and 2 Specialist maths must complete Unit 1 and 2 Mathematical Methods.

Specialist Mathematics Units 1 and 2

Semester: Semesters 1 and 2
Teacher: Mrs Nainie or Mrs Murrell

Pathways:
Math Method Units 3 and 4

Note:
Students undertaking this course of study MUST be enrolled in VCE Mathematical Methods Units 1 and 2.

Students are recommended to discuss their suitability for VCE Specialist Maths Units 1 and 2 with their Year 10 Introduction to Math methods teacher.

Entrance to this subject is based on the completion of Introduction to Math Methods In year 10 and teacher recommendation.

Students are encouraged to use https://delta.vtac.edu.au/CourseSearch/prerequisiteplanner.htm to research what University courses require Specialist Mathematics as a prerequisite. They are also encouraged to speak to the Careers advisors about career pathways.

Recommended Previous Studies:
Year 10 Mathematics A+B and Introduction to Math Methods

It is strongly recommended that students do not undertake a VET course whilst they are studying Specialist Mathematics.

Course Content:
The areas of study for VCE Specialist Mathematics Units 1 and 2 include topics such as Algebra and structure, Arithmetic and number, Geometry, measurement and trigonometry, Graphs of linear and non-linear functions, Discrete mathematics, Statistics.

VCE Specialist Mathematics Units 1 and 2 provides a strong foundation in mathematics for those students wishing to undertake studies in VCE Specialist Mathematics Units 3 and 4.

Assessed Coursework:
During this Unit, student progress could be monitored and assessed using:

- Common Assessment Tasks
- Exams
- Hurdle Tasks

Hurdle tasks could consist of Assignments, Homework Tasks and Application Tasks. Students are encouraged to develop a folio for each semester.

Additional Information:
Students require a TiNspire CX CAS calculator.
VCE Specialist Mathematics Units 1 and 2 is required study for students wishing to undertake Specialist Mathematics Units 3 and 4.

VCE Curriculum, Year 12

Further Mathematics Units 3 and 4

Semester: Semester 1 and 2
Teacher: Mr Williams

Recommended Previous Studies:
Successful completion of General Maths Units 1 and 2 or Mathematical Methods Units 1 and 2.

Note:
Students are encouraged to use https://delta.vtac.edu.au/CourseSearch/prerequisiteplanner.htm to research what University courses require Further Mathematics as a prerequisite. They are also encouraged to speak to the Careers advisors about career pathways.

Post-secondary Education examples: Accounting, Architecture, Commerce, Economics, Nursing, Science, Agricultural Science, Agri-business, Business Management, Aviation, Construction Management, Information Technology, Building Design, Defence, etc.

Employment examples: Business Manager, Small Business Owner, Accountant, Financial Advisor, Economist, Nurse, Scientist, Teaching, Defence Forces, State and Federal Police, Community Service, Paramedic, Architect, Draftsperson

Course Content:
VCE Further Mathematics builds on the knowledge and skills that are covered in Unit 1 and 2 General Maths There are two areas of study: Core and Applications. The core area of study, 'Data Analysis' and 'Recursion and Financial Modelling' is compulsory followed by a selection of two of a possible four optional modules from the Applications Area of Study.

The modules are Matrices, Networks and Decision mathematics, Geometry and measurement, Graphs and relations. At Lavalla Catholic College, we study the modules of Networks and Decision mathematics and Matrices.

Further Math Unit 3 and 4 builds on the mathematical modelling and problem-solving techniques (with and without CAS technology) developed in Unit 1 and 2 General Maths. It continues to develop a student's ability to select and justify the selection of a technique, apply it accurately and then interpret the results in a range of contexts of increasing complexity.

Assessed Coursework:
During this Unit, student progress could be monitored and assessed using:

- Student Assessed Coursework (SAC)
- Exams
- Hurdle Tasks

Hurdle Tasks could consist of Assignments, Homework Tasks and Application Tasks or an activity as prescribed by the subject teacher.

- SAC's make up 34% of the study score
- Unit 3 – 'Statistics' 1 x 300 minute Application Task and 'Finance' 1 x 120+ minutes Problem Solving or Modelling Task
- Unit 4 – 'Matrices' and 'Networks', 1 x 120+ minutes Problem Solving or Modelling Tash each (two in total
- Unit 3 and 4 Further Maths has 2 exam at the end of the year, each 90 minutes long.
    - Exam 1 Multiple Choice worth 33% of the study score
    - Exam 2 Short Answer worth 33% of the study score

Additional Information:
Students need to be proficient with a TI~Nspire CX CAS calculator.

Mathematical Methods Units 3 and 4

Semester: Semesters 1 and 2
Teacher: Ms Murrell

Recommended Previous Studies:
Successful completion of VCE Mathematical Methods Units 1 and 2.

Note:
Students are encouraged to use https://delta.vtac.edu.au/CourseSearch/prerequisiteplanner.htm to research what University courses require Mathematical Methods as a prerequisite. They are also encouraged to speak to the Careers advisors about career pathways.

Post-secondary Education examples: Engineering, Computer Science, Medicine, Biomedicine, Dentistry, Veterinary Science, Accounting, Commerce, Information Technology, Aviation, Nanotechnology, Radiography, Pharmacy, Science, Applied Science, Environments, etc.

Employment examples: Engineer, Surveyor, Pilot, Geophysicist, Medical Practitioner, Computer Programmer, Biochemist, Naval Architect, Meteorologist, Optometrist, Psychiatrist, Quantity Surveyor, Mathematics Teacher, Astronomer, Financial Advisor, Actuary, Army/Navy/Airforce Officer…

Course Content:
VCE Mathematical Methods Unit 3 and 4 follows on directly from Units 1 and 2. Areas studied are Functions and graphs, Algebra, Calculus, Probability and statistics.

Students' skills using CAS technology are further developed throughout the units. The course demands that students have a high degree of competency in preceding mathematical studies.

The units provide the background for further study in fields such as Architecture, Biological Sciences, Social Sciences, Engineering, Building, Cartography, Chemical Sciences, Business, Education, Commerce, Computers, Economics, Medicine, Technology Design, Mathematics and Statistics.

Assessed Coursework:
During this Unit, student progress could be monitored and assessed using:

- Student Assessed Coursework (SAC)
- Exams
- Hurdle Tasks

Hurdle tasks could consist of Assignments, Homework Tasks and Application Tasks

- SAC's make up 34% of the study score in this subject.
- Unit 3 – Statistics 1 x 240+ minute Application Task
- Unit 4 – 1 x 120+ minute Problem Solving or Modelling Task each (two in total)
- Unit 3 and 4 Mathematical Methods has 2 exams at the end of the year, each 90 minutes long
    - Exam 1 – Short and Extended answers, worth 22% of the study score (technology and summary note free)
    - Exam 2 Multiple Choice and Extended answer, worth 44% of the study score (technology and summary notes allowed)

Additional Information:
Students should be proficient with the use of a TI Nspire CX CAS calculator. Students may also have completed VCE Specialist Mathematics Units 1 and 2 or Unit 1 and 2 General Mathematics in conjunction with Unit 1 and 2 Mathematical Methods.

Specialist Mathematics Units 3 and 4

Semester: Semesters 1 and 2
Teacher: Mrs Nainie or Mrs Murrell

Recommended Previous Studies:
Successful completion of VCE Mathematical Methods Units 1 and 2 and Specialist Mathematics Units 1 and 2.

Note:
VCE Specialist Mathematics Units 3 and 4 can be undertaken concurrently with or on previous completion of VCE Mathematics Methods Units 3 and 4.

Students are encouraged to use https://delta.vtac.edu.au/CourseSearch/prerequisiteplanner.htm to research what University courses require Mathematical Methods as a prerequisite. They are also encouraged to speak to the Careers advisors about career pathways.

Post-secondary Education examples: Engineering, Computer Science, Medicine, Biomedicine, Dentistry, Veterinary Science, Accounting, Commerce, Information Technology, Aviation, Nanotechnology, Radiography, Pharmacy, Science, Applied Science, Environments and etc.

Employment examples: Engineer, Surveyor, Pilot, Geophysicist, Medical Practitioner, Computer Programmer, Biochemist, Naval Architect, Meteorologist, Optometrist, Psychiatrist, Quantity Surveyor, Mathematics Teacher, Astronomer, Financial Advisor, Actuary, Army/Navy/Air force Officer and etc.

Course Content:
The course assumes that students have a very high degree of competency in preceding mathematical studies. Areas of study are Functions and graphs, Algebra, Calculus, Vectors, Mechanics, Probability and statistics.

This course is intended for those with a strong interest in Mathematics or who wish to undertake specialist courses in Mathematics and related disciplines such as engineering and physical sciences. Throughout the course, CAS calculators will be used to reinforce students' understanding of concepts.

Assessed Coursework:
During this Unit, student progress could be monitored and assessed using:

- Student Assessed Coursework (SAC)
- Exams
- Hurdle Tasks

Hurdle tasks could consist of Assignments, Homework Tasks and Application Tasks or an activity as prescribed by the subject teacher.

- SAC's make up 34% of the study score in this subject.
- Unit 3 – Statistics 1 x 240+ minute Application Task.
- Unit 4 – 1 x 120+-minute Problem Solving or Modelling Task each (two in total).
- Unit 3 and 4 Specialist Maths has 2 exams at the end of the year, each 90 minutes long.
- Exam 1 – Short and Extended answers – worth 22% of the study score. (technology and summary note free)
- Exam 2 – Multiple Choice and Extended answer – worth 44% of the study score. (technology and summary notes allowed)

Additional Information:
Students should be proficient with the use of a Ti Nspire CX CAS calculator.