#### **STAGE 6 SUBJECT SELECTION INFORMATION**

# NATHEMATICS

PHS 2021 for 2022



# Is Mathematics For Me?

### DO YOU ENJOY IT?

Choose a mathematics course that is appropriate to your interests and current achievement level, but which is also challenging.

3

#### **STEM CAREERS**

If you are interested in a STEM career then studying a mathematics course is for you.

2

analytical

#### IS IT COMPULSORY?

The study of mathematics is not compulsory in Years 11 and 12.

#### **PRACTICAL APPLICATIONS**

- The study of mathematics builds
- logical, problem-solving capacity and
- thinking skills, applicable in many
- varied situations and careers.

# Which ATAR

### Courses Are

## Offered?

Gain a better understanding and application of mathematics and numeracy in real world situations.

and proofs. Use mathematical models more

extensively.

(YR 12 ONLY) Develop considerable manipulative skill and a

high degree of understanding of the

fundamental ideas of algebra and calculus.

#### **MATHEMATICS STANDARD**

#### **MATHEMATICS ADVANCED**

Learn about calculus, functions and statistics.

Investigate order, relation, pattern,

uncertainty and generality.

### **MATHEMATICS EXTENSION 1**

Develop rigorous mathematical arguments

### **MATHEMATICS EXTENSION 2**

### MATHEMATICS IN TRADES PATHWAY (New Course in 2022)

Learn the content of the Standard 1 course by completing different units. These are related to completing a trade.

#### MATHEMATICS STANDARD 1

In Year 12 you can choose to study Standard 1 and not complete the HSC exam.



# Are there NonAIAR Options?

#### WHICH LEVEL DID YOU STUDY





# What Do You Learn

About?

# Image: Note of Cost of Car Purchase Give Me a Brake Road Safety Cost of Car Purchase C

	Term Focus: 1. Driving Life	Examples of Projects Cost of Car Purchase Give Me a Brake Road Safety
Mathematics in Trades Year 11 course	2. Work Life	Buy and Maintain a Work Vehicle Exploring Tools of Trade Get to Work on Time
	3. Home Life	Diet and Health National Skill Shortage Saving for my first home Saving for my first small business



Mathematics in Trades Year 12 course

Term Focus:	Examples of Projects
1. Building Success	Scale Drawings Rates Right-Angled Triangles Graphs of
2. Demystifying Data	Investigating and Analysing Data
3. Small Business	Investment
Management	Depreciation and Loans
4. Break Even and Grow	Practical Situations Simultaneous Linear Equations

# Nathematics Standard 1

#### YR 11 TOPICS

Algebra Formulae and Equations Linear Relationships

> Measurement **Applications of Measurement** Working with Time

> > **Financial Mathematics** Money Matters

**Statistical Analysis Data Analysis Relative Frequency and Probability** 

Measurement Right-angled Triangles, Rates and Scale Drawings

#### **YR 12 TOPICS**

Algebra Types of Relationships

**Financial Mathematics** Investment, Depreciation and Loans

> **Statistical Analysis Further Statistical Analysis**

> > Networks Network and Paths

# Nathematics Standard 2

#### YR 11 TOPICS

Algebra Formulae and Equations Linear Relationships

> Measurement **Applications of Measurement** Working with Time

> > **Financial Mathematics** Money Matters

**Statistical Analysis** Data Analysis **Relative Frequency and Probability** 

#### **YR 12 TOPICS**

Algebra Types of Relationships

Measurement Non-right-angled Trigonometry, Rates and Ratios

> **Financial Mathematics Investments and Loans Annuities**

> > **Statistical Analysis Bivariate Data Analysis** The Normal Distribution

**Networks** Network Concepts **Critical Path Analysis** 

## **Mathematics** Advanced

#### YR 11 TOPICS

Algebra Formulae and Equations Linear Relationships

> Measurement Applications of Measurement Working with Time

**Financial Mathematics Money Matters** 

**Statistical Analysis** Data Analysis **Relative Frequency and Probability** 

Measurement Non-right-angled Trigonometry, Rates and Ratios

> **Financial Mathematics** Investments and Loans Annuities

#### YR 12 TOPICS

Algebra Types of Relationships

**Statistical Analysis Bivariate Data Analysis** The Normal Distribution

Networks Network Concepts **Critical Path Analysis** 

# Vathematics Extension 1

YR 11 TOPICS **Functions Further Work with Functions** Polynomials Trigonometric Functions **Inverse Trigonometric Functions** Further Trigonometric Identities Calculus Rates of Change Combinatorics Working with Combinatorics

Vectors Introduction to Vectors Calculus **Further Calculus Skills** Applications of Calculus **Statistical Analysis** The Binomial Distribution

#### YR 12 TOPICS

- Proof Proof by Mathematical Induction
- Trigonometric Functions Trigonometric Equations

# Nathematics Extension 2

topics

#### YR 12 TOPICS

- Graphs
- **Complex Numbers**
- Conics
- Integration
- Volumes
- **Mechanics**
- Polynomials
- Harder Mathematics Extension 1



# What About

## Assessment?

Each course has the same type of assessment tasks





### Yr 11 Assessments





### TASK ONE

#### Test

### TASK TWO

### Investigation Style Task with assignment AND test

### TASK

### Year RE Kam

### Yr 12 Assessments

### TASK ONE

Test

### TASK TWO

**Investigation Style Task** with assignment AND test

TASK THREE

Test

**TASK FOUR** 

**Trial HSC** 





2 hours and 30 minutes HSC Exam

(YR 12 ONLY)

# HSC

### Exams

#### MATHEMATICS STANDARD

#### MATHEMATICS ADVANCED 3 hour HSC Exam

#### **MATHEMATICS EXTENSION 1** 2 hour HSC Exam

#### MATHEMATICS EXTENSION 2

3 hour HSC Exam

# Passing the Subject with Flying Colors



### Use class time effectively.

### Complete your homework each day.

### Ask for help when you need it.

### • Revise regularly.

# Standard or

## Advanced?

Expert advice from the Mathematical Association of NSW

https://www.mansw.nsw.edu.au/resources/public-resources/mathe

matics-hsc-subject-choice-for-year-10-students





Mathematical Association of NSW Inc

Promoting Quality Mathematics Education for All

"Should I do Mathematics Advanced or Mathematics Standard in Years 11 and 12?"

#### The case for Mathematics Standard

Prior learning and background kn	owledge, skills and understanding
If there are things you did in Years 7 to 10 that were confusing at the time you will have a chance to consolidate your learning.	BUT You will revise many things that you may already know.
Mathematical cor	ntent of the course
The syllabus includes Applications and Modelling and other topics in which the mathematics is presented in real-life contexts. You will study Statistics, which is something you might need when you get to university. The syllabus includes the compulsory use of spreadsheets and other technology.	BUT The content of Mathematics Standard will not prepare you for many of the STEM* degrees at university. Statistics is covered in greater depth in the Mathematics Advanced course.
Time and ef	fort required
Capable students may find that they do not need to invest a huge amount of time into homework and studying.	BUT There are still many different topics and concepts to be covered and attaining a high level of achievement will still involve considerable practice. If you are not challenged by the level of mathematics, you may become disengaged.
Your fello	w students
You will not be in the same cohort as those students from other mathematics courses or students who have accelerated their study of mathematics.	BUT This course is designed for students who require more time to consolidate Mathematics 7 to 10. There is now common content with Mathematics Advanced, so your level of mathematics can be compared with those studying Mathematics Advanced when calculating your ATAR.
HSC Exa	mination
You will be given a Reference Sheet which will reduce the need to memorise certain formulae.	BUT The literacy demands are very high. Some of your responses will be written in mathematical text including diagrams but you also need to be able to explain your thinking and justify answers.
Entering university and su	cceeding in a STEM* degree
Some university degrees do not have mathematical requirements of any sort. See note on page 2 about Sydney University's prerequisites.	BUT If you choose a STEM degree you may be required to do a bridging course before you start first year or do a year of Foundation Studies.



Students and 5.2 a Techniqu Relation theorem and 10 v for Math

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With a co Years 11 with the become in the HS

You will reduce t Most of mathem be able t answers

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The information presented in this document reflects the considered views of the Mathematical Association of NSW (MANSW) and is based on available evidence and research findings. MANSW accepts no responsibility for the choices made by students based on the information provided in this document. Readers should investigate all information around this subject before choosing a mathematics course for Years 11 and 12.

An electronic version of this document can be found in the public resources section of the MANSW website at: https://www.mansw.nsw.edu.au/resources/public-resources. Date of publication: May 2020

\* Science-Technology-Engineering-Mathematics



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Promoting Quality Mathematics Education for All

"Should I do Mathematics Advanced or Mathematics Standard in Years 11 and 12?"

#### The case for Mathematics Advanced

Prior learning and background know	owledge, skills and understanding
s who have completes all substrands of 5.1 as well as the 5.3 substrands of Algebraic ues, Surds and Indices, Equations, Linear ships, Trigonometry and Pythagoras' and Single Variable Data Analysis in Year 9 will have adequate background knowledge mematics Advanced.	BUT If you did not do 5.3 Mathematics in Years 9 and 10 you will need to learn several new concepts, prior to the start of Year 11.
Mathematical con	itent of the course
ill be some revision of prior learning, but the content will be new to you. learn calculus, which prepares students fectively for success in university STEM* such as Engineering and Physics.	BUT You will need to develop a fluency with algebraic manipulation to succeed with Mathematics Advanced.
Time and eff	ort required
onsistently diligent approach throughout and 12, many students become familiar topics and techniques required and capable of achieving a good performance SC.	BUT You might feel that your teacher moves quickly through topics. Some students may need to spend more time on mathematics than their other subjects.
HSC Exar	mination
be given a Reference Sheet which will the need to memorise certain formulae. your responses will be written in natical text and graphs but you also need to to explain your thinking and justify your i.	BUT The HSC Examination builds upon all knowledge and skills developed throughout Stages 5 and 6 mathematics.
Entering university and suc	ceeding in a STEM* degree
e a much greater chance of succeeding if pplete Mathematics Advanced than if you athematics or Mathematics Standard. See page 2 about Sydney University's isites.	BUT If you also do Mathematics Extension 1 (and possibly Mathematics Extension 2) you may be better prepared for your university course.

\* Science-Technology-Engineering-Mathematics