



Mathematics and Sciences

@ MINDARIE SENIOR COLLEGE

ATAR Biology*

What is ATAR Biology?

Biology is the study of living things, how they function and interact with other organisms and their environment. If you are passionate about the environment and want to learn more about how the natural world around you functions, this Course is for you.

What will we cover?

We start the year by looking at ecosystems and biodiversity, exploring factors that affect ecosystems and the way they function. In Semester Two we start small – at the cellular level and then through to how whole systems function within an organism. We learn about a range of different organisms from bacteria to plants and a wide range of animal types.

What does a typical week look like?

When covering the content we use text references, videos and discussion, complemented with practical work. A field trip is a compulsory part of this course where we get to apply theory outside of the classroom. You will need to complete practice questions and research at home and watch wildlife documentaries to give a wide range of examples. Three hours a week of study is recommended to ensure you have a thorough understanding of concepts covered.

Complementary Courses

- ATAR/ General Human Biology
- ATAR/General Integrated Science
- ATAR Psychology
- ATAR Chemistry
- ATAR Mathematics Applications

What courses and careers can it lead to?

Animal services. Health services. Environmental and sustainability role.

<https://myfuture.edu.au/bullseyes/details/3--biology>

Are there any prerequisites?

- B grade in Year 10 English & Science

ATAR Chemistry*

What is ATAR Chemistry?

ATAR Chemistry focuses on understanding materials and compounds their properties and how they interact. We cover the theories that help us to understand and explain the way chemicals act and conduct labs that help to show this in action.

What will we cover?

The first topics we cover include reviewing some Year 10 concepts including atom structure and bonding. We begin calculations using the mole and look at some analytical techniques that are used in laboratories. Organic chemistry and chemical reactions finish the Semester 1 topics.

Semester 2 explores more new topics including Chromatography, Acids and Bases, Solutions and Reaction Rate. All of the topics from Year 11 support the topics covered in Year 12 by further building on them.

What does a typical week look like?

Our Chemistry lessons occur in spacious lab-ready Science classrooms. Most of your week is spent on theory and practice questions. Our specialist teachers use a range of strategies to explain the concepts involved and develop your understanding. Laboratory work is used to demonstrate the theory wherever possible; including flame tests, separation techniques, bonding properties, solubility and precipitation reactions, exothermic and endothermic reactions, acid base reactions, and reaction rate.

You will need to complete practice questions at home and review to memorise key facts like reactions, formula and theories. Three hours per week of home-study is recommended, with practice questions being the most effective way to ensure you understand Chemistry.

Complementary Courses

- ATAR Mathematics Methods
- ATAR Physics
- ATAR Mathematics Applications
- ATAR/General Human Biology
- ATAR Biology
- ATAR/General Engineering (Mechatronics)

What courses and careers can it lead to?

Forensic and environmental sciences. Engineering. Medicine. Dentistry. Pharmacy. Sports Science. Chemistry can be beneficial for a Bachelor of Science degree, or a Diploma or Certificate course related to Technicians, Laboratory Skills, Health, and Environmental Science.

<https://myfuture.edu.au/bullseyes/details/5--chemistry>

Are there any prerequisites?

- A grade in Year 10 Science (Chemical and/or Physical Science sub-strands)
- A grade in Year 10 Mathematics
- This course **cannot** be studied with ATAR Integrated Science

ATAR Human Biology*

What is ATAR Human Biology?

ATAR Human Biology is all about you (a human!). It is the best course for students who aspire to work in the health and medical industry.

What will we cover?

Students will discover the inner workings of the human body focussing on the structure (what it looks like) and function (what it does) of the Circulatory, Respiratory, Digestive, Excretory, Musculoskeletal and Reproductive Systems. Students also study DNA and Genetics, attending an excursion to the Harry Perkins Institute of Medical Research to use state of the art medical technology to look at stem cells. Not for the squeamish...this course includes dissections!

What does a typical week look like?

Students will be involved in a variety of engaging classroom activities with a strong digital focus. Students will have the opportunity to use microscopes, dissect organs and perform practical investigations. Students should expect 80% theory and 20% practical work.

Complementary Courses

- ATAR Psychology
- ATAR Chemistry
- ATAR/General Physical Education Studies
- ATAR Biology
- ATAR/General Health Studies

What courses and careers can it lead to?

Bachelor degrees in Health and Medical Sciences including Nursing, Paramedicine, Biomedicine, Physiotherapy, Exercise Physiology, Dentistry and Nutritionist, just to name a few.

<https://myfuture.edu.au/bullseyes/details/3--biology>

Are there any prerequisites?

- B grade in Year 10 Science

General Human Biology*

What is General Human Biology?

General Human Biology is all about you (a human!). It is the best course for students who aspire to work in the health services and sporting industry.

What will we cover?

Students will discover the inner workings of the human body focussing on how to maintain a healthy body. Focus is on the body systems including the Circulatory, Respiratory, Digestive, Urinary and Musculoskeletal Systems. We look at not only how each system works, but also what happens when things go wrong. Not for the squeamish...this course includes dissections!

What does a typical week look like?

Students will be involved in a variety of engaging classroom activities with a strong digital focus. Students will have the opportunity to use microscopes, dissect organs and perform practical investigations. Project based learning is a prime focus of this course with a 'hands on' approach to learning. Students should expect 60% theory and 40% practical work.

Complementary Courses

- ATAR Psychology
- ATAR Chemistry
- ATAR/General Physical Education Studies
- ATAR Biology
- ATAR/General Health Studies
- ATAR/General Integrated Science

What courses and careers can it lead to?

A variety of TAFE courses including Allied Health Services, Enrolled Nursing, Beauty Therapy, Hairdressing, Personal Training, Dental Assistant and Science Technician.

<https://myfuture.edu.au/bullseyes/details/3--biology>

Are there any prerequisites?

- C grade in Year 10 Science

ATAR Integrated Science*

What is ATAR Integrated Science?

Do you enjoy science? Do you want to do an ATAR course but don't want to study just one discipline?

The ATAR Integrated Science course aims to integrate a range of science disciplines including Biology, Physics, Earth Science and Chemistry. It examines the use of technology in our rapidly changing world, encouraging students to develop the scientific skills of observation, collection and analysis of data in the contexts of driver safety, hearing, biodiversity, and conservation.

This ATAR course is not available at many schools, but it is available at Mindarie Senior College.

What will we cover?

Semester 1 explores two major issues for today's society: safety on the roads, and the effects of listening to loud sounds. With many Year 11 students getting their learner's permit, this timely unit looks at the science principles behind driving safely. And...when was the last time you used your earbuds? What are the properties of sound? Were you listening to the music at a recommended volume? Will you need hearing assistance when you get older because of your listening habits?

Semester 2 looks at Biodiversity and Conservation and the issues associated with human population growth and resource use.

What does a typical week look like?

Lessons consist of content, research and practical activities. There is a field trip to examine a local environment.

Complementary Courses

- ATAR Psychology
- ATAR/General Human Biology
- ATAR Biology

What courses and careers can it lead to?

There are many courses at TAFE and University that employ scientific understanding.

<https://myfuture.edu.au/bullseyes/details/13--environmental-sciences>

Are there any prerequisites?

- B grade in Year 10 Science
- This course **cannot** be studied with ATAR Chemistry or ATAR Physics

General Science in Practice*

What is General Science in Practice?

The General Science in Practice course enables student to investigate science issues in the context of the world around them. It encourages students to develop their scientific skills of observation, collection and analysis of evidence, in a range of contexts and apply to real life situations.

What will we cover?

In Unit 1, students develop an understanding of the processes involved in the functioning of systems from the macro level to systems at the organism, cellular and molecular level. This covers biology and earth science topics.

In Unit 2 students develop an understanding of the processes involved in the transformation and redistribution of matter and energy in biological, chemical and physical systems from the atomic to macro level. This unit covers mostly chemistry and physics concepts.

What does a typical week look like?

Students will be involved in a variety of engaging classroom activities, including practical work to complement the theory. Students will use technology to enhance their understanding of scientific principles.

Complementary Courses

- ATAR Psychology
- ATAR/General Human Biology
- ATAR Biology
- General Mathematics Essentials
- ATAR Integrated Science

What courses and careers can it lead to?

General science literacy is valuable to many careers and desirable for future study in many TAFE courses

<https://myfuture.edu.au/bullseyes/details/13--environmental-sciences>

There are no prerequisites for this course.

ATAR Physics*

What is ATAR Physics?

Physics is a fundamental science that endeavours to explain all the natural phenomena that occur in the universe. Its power lies in the use of a comparatively small number of assumptions, models, laws and theories to explain a wide range of phenomena, from the incredibly small to the incredibly large. The Physics ATAR course uses qualitative and quantitative models and theories based on physical laws to visualise, explain and predict physical phenomena. In this course, students gather, analyse and interpret data to investigate a range of phenomena and technologies using some of the most important models, laws and theories of physics, including the kinetic particle model, the atomic model, electromagnetic theory, and the laws of classical mechanics.

Studying physics will enable students to become citizens who are better informed about the world around them and who have the critical skills to evaluate and make evidence-based decisions about current scientific issues.

What will we cover?

- Heating & Cooling
- Ionising Radiation & Nuclear Reactions
- Electrical Circuits
- Electromagnetism,
- Waves & Wave Particle Duality
- Quantum Theory
- The Standard Model
- Special Relativity
- Linear Motion & Force
- Gravity & Motion

What does a typical week look like?

Students can expect an expert delivery of the theory as well as hands on experience, in our technologically advanced and spacious science laboratories, including but not limited to investigating radiation, projectile motion, lasers, magnetism, electrical circuits as well as some thermodynamic experiments.

Complementary Courses

- ATAR Mathematics Methods
- ATAR Mathematics Specialist
- ATAR Chemistry
- ATAR/General Engineering (Mechatronics)

What courses and careers can it lead to?

Certificate IV in Electronics and Communications, Diploma of Aviation, Diploma of Civil and Structural Engineering.

Bachelor of Science, Bachelor of Engineering, Bachelor of Medicine, Bachelor of Nursing.

<https://myfuture.edu.au/bullseyes/details/29--physics>

Are there any prerequisites?

- B grade in Year 10 Science (Chemical and/or Physical Science sub-strands)
- A grade in Year 10 Mathematics
- This course **cannot** be studied with ATAR Integrated Science

ATAR Psychology*

What is ATAR Psychology?

ATAR Psychology helps you gain an understanding of how your mind works and how people behave and interact with others. Psychology is a fascinating field that explores the working of the brain and how it influences your behaviour. The knowledge you gain will help you to navigate relationships, work more effectively in teams and better understand the world around you.

What will we cover?

We will cover psychological theories and concepts which you can relate to your everyday life such as:

- the inner workings of your brain
- physical and emotional development
- social interactions
- external influences on your behaviour

What does a typical week look like?

In your Psychology class there is a balance of practical and theoretical lessons. Engaging experiments are designed to explore psychological concepts that link to your real-life experiences, whilst working collaboratively with your peers. This course combines your psychological science understanding with science inquiry skills, to enable you to critically analyse famous, historical psychological experiments.

Complementary Courses

- ATAR Mathematics Applications
- ATAR/General Integrated Science
- ATAR/General Physical Education Studies
- ATAR/General Human Biology
- ATAR/General Health Studies
- ATAR Biology
- ATAR English

What courses and careers can it lead to?

Psychologist, Psychiatrist, School Teacher, Counsellors, Criminal/Forensic Psychologist, Sport Psychologist, Market Research Analyst, Communications officer, Social Media Analyst, Health and Well-being Officer, Human Resources, Recruitment Consultant, Occupational Health and Safety Officer, Art therapist.

<https://myfuture.edu.au/bullseyes/details/32--social-sciences>

Are there any prerequisites?

- B grade in Year 10 Science & English
- C grade in Year 10 Mathematics

ATAR Mathematics Specialist*

What is ATAR Mathematics Specialist?

This course deepens and extends many ideas that are taught in the Mathematics Methods course as well as introduces topics that will not have been met before in previous studies.

Students undertaking ATAR Mathematics Specialist in Year 12 will receive a 10% bonus of their final scaled score, towards their ATAR.

What will we cover?

- Geometry
- Combinatorics
- Vectors
- Trigonometry
- Matrices
- Real and complex numbers

Students will also develop skills in mathematical arguments and proof.

What does a typical week look like?

Content delivery can take the form of taking notes, completing examples as a class, working on exercises, quizzes, making posters, card sorts etc. Students will also sit their assessments in class including response items and investigations. Investigations may also be required to be completed outside of classroom time. As a guide, students would typically spend around 3-4 hours working on this course at home.

Complementary Courses

- ATAR Mathematics Methods
- ATAR Physics
- ATAR/General Computer Science
- ATAR/General Human Biology
- ATAR Chemistry
- ATAR/General Engineering (Mechatronics)

What courses and careers can it lead to?

Degrees in specialised fields such as Medicine, Engineering, Physical Sciences and Mathematics.

<https://myfuture.edu.au/bullseyes/details/22--maths>

Are there any prerequisites?

- A grade in Year 10 Mathematics
- Solid algebraic understanding and skills
- This course **must** be taken with ATAR Mathematics Methods

ATAR Mathematics Methods*

What is ATAR Mathematics Methods?

ATAR Mathematics Methods provides a foundation for further studies in careers where mathematical and statistical concepts have important roles.

Students undertaking ATAR Mathematics Methods in Year 12 will receive a 10% bonus of their final scaled score, towards their ATAR.

What will we cover?

The major themes of the Mathematics Methods ATAR course are calculus and statistics.

- Review of basic algebraic concepts and techniques which allows an introduction to the study of functions and calculus.
- Building on the concepts of conditional probability and independence.
- The study of the trigonometric function & its application is extended.
- Exponential functions are introduced, and their properties and graphs examined.
- Understanding concepts & solving problems involving Arithmetic and Geometric sequences.
- Introduction to techniques used in differential calculus.

What does a typical week look like?

Most of your week is spent on theory and practice questions. Our specialist teachers use a range of strategies to explain the concepts involved and developing your understanding. Three hours per week of study is recommended, with practice questions being the most effective way to ensure you understand the concepts.

Complementary Courses

- ATAR Mathematics Specialist
- ATAR Physics
- ATAR/General Computer Science
- ATAR Mathematics Applications
- ATAR Chemistry
- ATAR/General Engineering (Mechatronics)

What courses and careers can it lead to?

Methods can prepare students for a range of careers, including those as a Data Analyst, Scientist, Statistician, Mathematician, Forensic Science, Environmental Science, Engineering, Medicine, Dentistry, Pharmacy, Physiotherapist, Sports Science, Architecture, Computer Science, Programmer, Economist, Actuary, Physicist.

<https://myfuture.edu.au/bullseyes/details/22--maths>

Are there any prerequisites?

- A grade in Year 10 Mathematics
- Solid algebraic understanding and skills
- This course can be combined with **either** ATAR Mathematics Specialist **or** ATAR Mathematics Applications

ATAR Mathematics Applications*

What is ATAR Mathematics Applications?

Mathematics Applications is an ATAR course which focuses on using Mathematics to solve problems.

What will we cover?

Students will start their year studying Arithmetic and Percentages and applying these skills to real situations such as Interest, Inflation and other financial considerations. We then explore Finance further, looking at different types of Income and Wages, Shares, Budgets, Foreign Currency and Comparing prices. Semester 1 also includes topics such as Matrices, Measurement, including Area, Surface Area and Volume; Pythagorean Theorem and Scales and Similarity.

Moving into Semester 2, students will focus on Statistics and Data Analysis, Linear Equations and Functions and Trigonometry. These skills are then applied to real world situations and are used to solve problems.

What does a typical week look like?

Lessons can involve teacher directed learning, note taking, completion of exercises and practice questions, online quizzes, group activities and assessments. Most assessments are completed during class time. The main assessment types are Response Tasks, Investigations and Examinations. As a guide, it is recommended that students complete three hours of study a week at home to reinforce and revise their skills and concepts taught.

Complementary Courses

- ATAR/General Human Biology
- ATAR/General Food Science & Technology
- ATAR Mathematics Methods
- ATAR/General Accounting & Finance
- ATAR/General Integrated Science
- ATAR/General Physical Education Studies

What courses and careers can it lead to?

This course is designed for students who want to continue their studies at a University or TAFE level, without requiring the specific skills of Calculus. Example Degrees and Courses include: Bachelor of Science, Nursing, Exercise Physiology, Education, Accounting, Bachelor of Commerce or Business, Electrical Apprenticeship.

<https://myfuture.edu.au/bullseyes/details/22--maths>

Are there any prerequisites?

- C grade in Year 10 Mathematics
- This course can be combined with ATAR Mathematics Methods

General Mathematics Essential*

What is General Mathematics Essential?

This course is all about preparing students for life after school by arming them with the essential mathematical skills that underpin everyday life.

What will we cover?

General Mathematics Essential is all about developing skills that will prepare students to take on post-school life and the challenges of their varied workplace, personal and further learning contexts. This includes topics such as powering your body effectively, earning and saving money, budgeting and making informed decisions about purchases.

Students will also develop skills that will enable them to productively problem-solve in a variety of situations they may encounter throughout life.

What does a typical week look like?

The General Mathematics Essential course provides varied learning experiences to the students, including the delivery of mathematical theory, as well as opportunities to investigate and apply these skills in various real-life contexts.

Complementary Courses

- General Integrated Science
- General Business Management & Enterprise
- General Human Biology
- General Geography
- General Health Studies
- General Food Science & Technology

What courses and careers can it lead to?

Careers in sales and consulting. Trades like construction, plumbing and mechanics.

<https://myfuture.edu.au/bullseyes/details/22--maths>

Are there any prerequisites?

No course pre-requisites but students must have achieved Category 2 or above in Numeracy OLNA. Students who are yet to achieve Category 2 in Numeracy OLNA must enrol in the Mathematics Foundations Course.

Foundation Mathematics*

What is Foundation Mathematics?

In Foundation Mathematics students improve their number skills by going back to the basics and filling in the gaps from previous years.

What will we cover?

Topics include mental calculations, measurement, time and statistics with a focus on whole numbers and money, before moving on to fractions, decimals and percentages.

What does a typical week look like?

There is a balance of written work and concrete examples. Students take measurements and work with physical objects to make strong connections between mathematics and the real world.

What can it lead to?

With its focus on mental number skills and building understanding of basic mathematics concepts this course helps students acquire the mathematical skills needed for the workplace. Passing OLNA is a primary goal and some students move from Foundation to Essential Mathematics General after success in OLNA.

Are there any prerequisites?

Mathematics Foundation is only available to students who are yet to achieve Cat 2 in OLNA.