What class will you take in Biological Sciences?
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Discover
School’s welcome

Welcome to the School of Life and Environmental Sciences and congratulations on your entry into the University of Sydney community. We all hope that your time with us will be enjoyable and rewarding.

We offer a range of introductory junior units of study to choose from in your first year of university. These will provide you with a good grounding in biology and prepare you for second- and third-year units. If you haven’t done biology before, our units will introduce you gradually to biology and help you to appreciate and understand the inner workings of life.

If you are feeling particularly out of your depth, we offer a biology bridging course, before semester one starts, to give you a kick-start into university-level biology. If you have done biology previously, our advanced level units will give you a greater depth of knowledge that will extend your understanding and challenge your ideas about biology.

You’ll be taken through this journey, in large and small classes, ranging from lectures and practical classes through to workshops, tutorials and field-trips in later years. In our classes, you’ll learn about the workings of biology and how real scientists investigate life. You’ll also meet new friends and establish networks who will help you in your time at the University of Sydney.

In all this, you may feel a bit lost. Please feel free to ask for help if you need it – university is a big place so help us to help you by letting us know how. There is plenty of support for you as you move through your university career – staff are always willing to answer questions, your peers are a valuable resource, and there is a range of people and resources to provide learning support if you need it.

We want you all to do well and enjoy your time with us in the Biological Sciences. Once again, congratulations on achieving a place at the University of Sydney.
How to...

Understand this booklet

Junior year = First year;
Intermediate year = Second year;
Senior year = Third year

Unit of study = stand-alone subject taken over one semester as part of a
degree course.
Credit points = value of a unit of
study. All junior biology units of
study are 6 credit points.

Choose your biology subjects

Our flagship junior-year units,
Concepts in biology (biological
molecules, cell biology, genetics,
evolution and biodiversity) and
Living systems (animals, plants and
ecology), provide you with a broad
overview of key biological concepts
and systems.

In modern biology, a solid grounding
in molecular biology and genetics is
becoming increasingly important, so
we recommend that you also take
Introduction to molecular biology
and genetics.

For those who are focused on
the medical sciences, Concepts
in biology and Living systems will
provide you with a firm grasp of
the biology that is necessary for
understanding the inner workings
of cells, tissues and organisms.

In first-year, you can take up
to four units of study in junior
biology: Concepts in biology
(BIOL**1), Living systems (BIOL**2),
Human biology (BIOL**3) and
Introduction to molecular biology
and genetics (MBLG**1). However,
it is recommended that students
attempt no more than two of the
three junior BIOL units of study.

To enter intermediate (second-year)
units in biology (BIOL***) you will
need a pass grade in two of these
junior-year BIOL/MBLG units.

To enter Genetics and genomics
(MBLG2072), the intermediate unit
in molecular biology, you will need a
pass grade in MBLG1**1, one junior
level BIOL unit and one junior level
CHEM unit.

More information about majors in
biology with more advice on unit of
study selections can be found at
- sydney.edu.au/science/biology/
studying_biology/undergraduate.
shtml

Catch up if you didn’t study
biology at high school

If you haven’t completed HSC
Biology (or equivalent) at school, or
if you need a refresher in biology,
then consider enrolling in the
Biology bridging course that is run a
few weeks before semester 1 begins.

This course is a great introduction
for the university-level Concepts
in biology (BIOL1001) and Human
biology (BIOL1003) units of study
that run in first semester. The
bridging course will cover the basics
of cell biology, genetics, evolution,
and core laboratory skills to give you
a firm foundation for further study in
BIOL1001 or BIOL1003.

Dates: 15 – 19 February 2016
Cost: $360
Contact: Associate Professor
Charlotte Taylor (charlotte.taylor@
sydney.edu.au).
- sydney.edu.au/science/fstudent/
undergrad/entry/bridging.shtml

Jump ahead if you are a
high-achiever

Are you a bright high-achiever
looking for an accelerated start in
biological research? If you’re part of
the talented student program,
you will be offered special project
work that introduces you to
research activities supervised by
academic staff. This will broaden
your knowledge of biology, giving
you insight into how biologists think
and how real research projects are
tackled.

Entry to the talented student
program is by invitation from the
Dean. To be eligible for this program
you must have an ATAR score (or
equivalent) of at least 99, or 90+ in
at least one HSC science subject
(or equivalent) and/or a mark of
95+ in HSC Mathematics extension
2. The Dean may consider minor
variations to these requirements
where students have demonstrated
exceptional performance in
scientific study (e.g. participation in
an International Olympiad).

Projects undertaken in the talented
student program appear separately
on university academic transcripts
so that potential employers are
aware students have undertaken
the additional challenges of this
program.

Please contact the talented student
program coordinator,
Associate Professor Dieter Hochuli
(dieter.hochuli@sydney.edu.au) to
register your interest.
- sydney.edu.au/science/biology/
studying_biology/talented-student-
program.shtml
Units of study
Concepts in biology

BIOL1001

Course description
The Concepts in biology unit covers fundamental cell biology, with a particular emphasis on cell structure and function; the foundations of molecular biology from the role of DNA in protein synthesis to the genetics of organisms; and the theory of evolution and principles of phylogenetic analysis, including how these are used to interpret the origins of the diversity of extant organisms.

Practical classes focus on students designing experiments, making and recording their observations and communicating their findings. The unit emphasises how biologists carry out scientific investigations, from the molecular and cellular level to the level of ecosystems. This unit of study provides a good foundation for intermediate biology units of study.

Course details
Credit points: 6
Unit Coordinator: Associate Professor Charlotte Taylor (charlotte.taylor@sydney.edu.au)
Session: Semester 1
Classes: two 1-hour lectures and one 3-hour practical per week
Pre-requisites: none
Prohibitions: BIOL1911, BIOL1991
Assumed knowledge: HSC Biology, however, students who have not completed HSC Biology (or equivalent) are strongly advised to take the Biology bridging course in February. (see page 5)
Assessment: One 2-hour exam, assignments tests and lab quizzes (100%)

Textbook

Note: Textbooks can be purchased from the Co-op bookshop and are available for short-term loan from SciTech Library and the Biology enquiries office on level 5 Carslaw. A laboratory manual for this unit will be available for purchase before the first week of semester, and can be downloaded free as a PDF once you are enrolled into the university eLearning system.

BIOL1911

Course description
Concepts in biology (Advanced) has the same overall structure as BIOL1001 but material is discussed in greater detail and at a more advanced level.

Students enrolled in BIOL1901 participate in alternative components, which include a separate lecture and practical stream from BIOL1001. The content and nature of these components may vary from year to year.

Course details
Credit points: 6
Unit Coordinator: Associate Professor Charlotte Taylor (charlotte.taylor@sydney.edu.au)
Session: Semester 1
Classes: two 1-hour lectures and one 3-hour practical per week
Pre-requisites: 80+ in HSC biology (or equivalent), ATAR of 95 or above, distinction or above in a university-level biology unit, or with special permission
Prohibitions: BIOL1001, BIOL1991
Assumed knowledge: HSC Biology (or equivalent)
Assessment: One 2-hour exam, assignments, tests, lab quizzes (100%)

Textbook
As for BIOL1001
BIOL1991

Course description
Entry to the Special studies program in Concepts in biology is restricted to students who have done exceptionally well in their HSC and/or have shown extraordinary aptitude in biology.

The practical work for BIOL1991 is very different from that of BIOL1911 (Advanced) and consists of project-based laboratory exercises.

Course details
Credit points: 6
Unit Coordinator: Associate Professor Simon Ho (simon.ho@sydney.edu.au) and Associate Professor Nate Lo (nathan.lo@sydney.edu.au)
Session: Semester 1
Classes: lectures as per BIOL1911
Pre-requisites: 90+ in HSC Biology (or equivalent) and ATAR of >95, or ATAR of >99, or medallist in International biology olympiad.
Prohibitions: BIOL1001, BIOL1911, BIOL1993
Assumed knowledge: HSC Biology (or equivalent)
Assessment: One 2-hour exam (50%), practical reports (25%), seminar presentation (15%), laboratory note book (5%), and pre-laboratory quizzes (5%)

Textbooks
Human biology

BIOL1003

Course description
This unit of study provides an introduction to human anatomy and physiology. It includes an overview of cell and tissue structures, the skeletal system, nutrition, digestion and excretion.

Human biology looks at how our bodies respond to environmental stimuli with respect to the endocrine, nervous and immune systems. After discussion of reproduction and development, it concludes with an overview of modern studies in human genetics.

This unit has four main components: lectures, practicals, workshops and online activities; this unit of study provides a suitable foundation for intermediate biology units of study.

Textbook

Course details
Credit points: 6
Unit Coordinator: Dr Osu Lilje (osu.lilje@sydney.edu.au)
Session: Semester 1
Classes: two to three 1-hour lectures per week, one 3-hour practical per fortnight, 6–9 hours of online activities per fortnight and one 2 hour workshop per fortnight
Pre-requisites: none, however semester 1 students who have not completed HSC Biology (or equivalent) are advised to take the Biology bridging course before semester starts (see page 5)
Prohibitions: BIOL1903, BIOL1993
Assumed knowledge: HSC Biology, however, students who have not completed HSC Biology (or equivalent) are strongly advised to take the Biology bridging course (in February, see page 5)
Assessment: One 2-hour exam, assignments and tests (100%)

BIOL1903

Course description
This unit of study has the same overall structure as BIOL1003 but material is discussed in greater detail and at a more advanced level. Students enrolled in BIOL1903 participate in alternative components, e.g. guest lecture series and practical classes.

The content and nature of these components may vary from year to year.

Course details
Credit points: 6
Unit Coordinator: Dr Osu Lilje (osu.lilje@sydney.edu.au)
Session: Semester 1
Classes: two to three 1-hour lectures per week, one 3-hour practical per fortnight, 6–9 hours of online activities per fortnight and one 2 hour workshop per fortnight
Pre-requisites: 90+ in HSC Biology (or equivalent), ATAR of 95 or above, distinction or above in a university-level biology
Prohibitions: BIOL1003, BIOL1993
Assumed knowledge: HSC Biology
Assessment: assignments, group project presentation, discussion activities, tests, and end-of-semester exam

Textbook
As for BIOL1003
BIOL1993

Course description
Entry to Special studies program in Human biology is restricted to students who have done exceptionally well in their HSC and/or have shown extraordinary aptitude in biology.

The practical work for BIOL1993 is very different from that of BIOL1903 (Advanced) and consists of special project-based laboratory exercises.

Course details
Credit points: 6
Unit Coordinator: Associate Professor Simon Ho (simon.ho@sydney.edu.au) and Associate Professor Nate Lo (nathan.lo@sydney.edu.au)
Session: Semester 1
Classes: Lectures as for BIOL1903. One 3-hour practical per week
Pre-requisites: 90+ in HSC biology (or equivalent) and ATAR of >95, or ATAR of >99, or medallist in International biology olympiad.
Prohibitions: BIOL1003, BIOL1903, BIOL1991
Assumed knowledge: HSC Biology (or equivalent)
Assessment: One 2-hour exam (50%), practical reports (25%), seminar presentation (15%), laboratory note book (5%), and pre-laboratory quizzes (5%)

Textbooks
Living systems

BIOL1002

Course description
Living systems deals with the biology of organisms as individuals, within populations and as part of communities and ecosystems. A broad range of taxa is presented, from bacteria to large plants and animals, and emphasis is placed upon understanding the ways in which they can live in a range of habitats.

Behaviour is discussed as a key process linking organismal-level processes to population and community dynamics. The importance of energy in living systems, and how elements are used and recycled in biological communities, are introduced as the basis of ecosystems.

The unit of study includes lectures and laboratory classes on the physiology and behaviour of animals and plants, the ways in which organisms control and integrate their activities and the processes controlling dynamics of populations and community. These themes are revisited within applied contexts to discuss issues such as management and conservation.

This unit of study provides a good foundation for intermediate biology units of study.

Course details
Credit points: 6
Unit Coordinator: Dr Matthew Pye (matthew.pye@sydney.edu.au)
Session: Semester 2
Classes: two 1-hour lectures and one 2.5-hour practical per week and tutorials every few weeks
Pre-requisites: none, however students who have not completed HSC biology (or equivalent) are advised to take the Biology bridging course (in February, see page 5)
Prohibitions: BIOL1902
Assumed knowledge: HSC Biology (or equivalent)
Assessment: One 2-hour exam, assignments, quizzes (100%)

Textbook

Note: Textbooks can be purchased from the Co-op bookshop and are available for short-term loan from SciTech Library and the Biology enquiries office on level 5 Carslaw. A laboratory manual for this unit will be available for purchase before the first week of semester, and can be downloaded free as a PDF once you are enrolled into the university eLearning system.

BIOL1902

Course description
This unit of study has the same overall structure as BIOL1002 but material is discussed in greater detail and at a more advanced level. Students enrolled in BIOL1902 participate in alternative components, which include a separate lecture and practical stream from BIOL1002.

The content and nature of these components may vary from year to year, but includes a weekend field trip to our research station at Pearl Beach, NSW.

During the field trip you will design and carry out an experiment using the local flora and/or fauna of Brisbane Waters National Park.

Textbook
As for BIOL1002
BIOL1992

Course description
The lecture component of this unit of study is the same as Living systems (Advanced), but the practical work differs.

The practical work includes project-based research exercises under the direct supervision of academics – an exciting leap straight into science research labs.

Entry to the Special studies program in Living systems is restricted to students who have done exceptionally well in their HSC and/or have shown extraordinary aptitude in biology.

Note: Departmental permission required for enrolment.

Textbook
As for BIOL1002

Course details
Credit points: 6
Unit Coordinator: Associate Professor Dieter Hochuli (dieter.hochuli@sydney.edu.au)
Session: Semester 2
Classes: two 1-hour lectures per week, tutorials, fieldwork and one 2.5-hour practical per week (including project work)
Pre-requisites: 90+ in HSC biology (or equivalent), or ATAR of 99 or above, or medallist in International biology olympiad, or exceptional performance in relevant units of study.
Prohibitions: BIOL1002, BIOL1902
Assumed knowledge: none.
Assessment: one 2-hour exam (38%), week 6 and 10 tests (20%), lab notebook and summary (12%), quizzes (10%), independent project (20%)
Introduction to molecular biology and genetics

MBLG1001

Course description
The lectures in this unit of study introduce the ‘central dogma’ of molecular biology and genetics – the molecular basis of life. The course begins with macromolecules in living cells: DNA, RNA and protein, and explores how their structures allow them to fulfill their various biological roles. This is followed by a review of how DNA is organised into genes leading to discussion replication and gene expression (transcription and translation). The unit concludes with an introduction to the techniques of molecular biology and, in particular, how these techniques have led to an explosion of interest and research in molecular biology.

The practical component complements the lectures by exposing students to experiments that explore the measurement of enzyme activity, the isolation of DNA and the ‘cutting’ of DNA using restriction enzymes. However, a key aim of the practicals is to give students higher-level generic skills in computing, communication, criticism, data analysis/evaluation and experimental design.

Course details
Credit points: 6
Unit Coordinator: Dr Dale Hancock (dale.hancock@sydney.edu.au)
Session: Semester 2
Classes: two 1-hour lectures per week, one 4-hour practical and one 1-hour tutorial per fortnight
Pre-requisites: none
Prohibitions: MBLG1901, MBLG1991
Assumed knowledge: 6 credit points of junior biology and 6 credit points of junior chemistry
Assessment: One 2.5-hour exam, in-semester skills test and assignments (100%)

Textbooks

The textbook is a custom publication from Pearson (a combination of sections from 2 textbooks) which will be available at the beginning of the semester from the Co-op bookshop.

MBLG1901

Course description
Qualified students will participate in some alternative components of MBLG1001.

The advanced component is designed for students interested in continuing in molecular biology. It consists of seven advanced lectures (replacing seven regular lectures) and three advanced laboratory sessions (replacing three regular practical classes). The advanced lectures will focus on the experiments which led to key discoveries in molecular biology. The advanced practical sessions will give students the opportunity to explore alternative molecular biology experimental techniques. Attendance at MBLG1999 seminars is strongly encouraged.

Course details
Credit points: 6
Unit Coordinator: Dr Dale Hancock (dale.hancock@sydney.edu.au)
Session: Semester 2
Classes: two 1-hour lectures per week, one 1-hour tutorial and one 4-hour practical per fortnight, four 1-hour seminars per semester
Pre-requisites: 80+ in HSC Chemistry and biology (or equivalent), ATAR of 95 or above or by invitation
Prohibitions: MBLG1001, MBLG1991
Assumed knowledge: HSC Chemistry and biology (or equivalent), or 6 credit points of junior biology and 6 credit points of junior chemistry
Assessment: One 2.5-hour exam, in-semester skills test and assignments (100%)

Textbooks
As for MBLG1001
MBLG1991

Course description
The same theory content will be covered as in the Advanced stream (MBLG1901) but in this Special studies unit, the practical component is a research project. The research will be a synthetic biology project investigating the properties of genetically engineered organisms. This unit of study will give students experience in using molecular biology approaches to solve current environmental and medical problems.

Students will have the opportunity to develop higher level generic skills in computing, communication, critical analysis, problem solving, data analysis/evaluation and experimental design.

Course details
Credit points: 6
Unit Coordinator: Dr Dale Hancock (dale.hancock@sydney.edu.au)
Session: Semester 2
Classes: two 1-hour lectures per week, one 1-hour tutorial and one 4-hour practical per fortnight
Pre-requisites: By invitation based on ATAR of 99 or above and 90+ in HSC Chemistry or Biology (or equivalent)
Prohibitions: MBLG1001, MBLG1901
Assumed knowledge: 6 credit points of junior biology and 6 credit points of junior chemistry
Assessment: One 2.5-hour exam (60%), project report and presentation (15%), assignments (10%), practical test (15%)
Textbook
As for MBLG1001
### Units of study

#### Junior

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<th>Semester</th>
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<tr>
<td>BIOL1003/1903/1993</td>
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<td>MBLG1001/1901/1991</td>
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#### Intermediate

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<td>BIOL2023/2923</td>
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<tr>
<td>BIOL2016/2916</td>
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<td>MBLG2072/2972</td>
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#### Senior

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#### Honours (optional)

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<td>BIOL4015</td>
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<td>BIOL4013 and 4014</td>
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</table>
Here we have summarised the most important things you need to know coming into your first-year units with us. More in-depth information can be found on our website and from the university’s eLearning system, once you are enrolled.

− sydney.edu.au/science/biology/studying_biology

**eLearning at Sydney University**
Before the first week of semester, you will be provided access to the University’s eLearning system (called Blackboard). This is where most of the resources for your units will be placed, including lecture notes and recordings, practical information, course and assessment resources, and advice on what to do if you are ill and cannot attend a class. Be sure to check this site daily!

− elearning.sydney.edu.au

**Your university email** is another avenue of official communication. All email information that comes from unit co-ordinators goes to this address. Make sure you check this daily as well.

Your classes are timetabled into your personalised timetable. You need to attend all the classes that are timetabled for you. Updates or last-minute changes to classes will be posted on Blackboard.

The University has attendance requirements that need to be met, but more fundamentally, you won’t learn if you’re not in class! Please attend your timetabled sessions – we have carefully placed you into your timeslots.

**Textbooks and course notes/lab manuals** are available from the Co-op Bookshop, located close to the Sports and Aquatic Centre, or online from PublishPartner. More details will be provided before the start of semester.

− coop-bookshop.com.au
− publishpartner.com.au/students/

**Practical classes** are an integral part of our courses – you learn science primarily by doing science. Practical classes are small and you get to know a lot of people through them. Make sure you attend all of your timetabled practical classes and do any necessary preparation beforehand. Venues are typically listed on your timetable, but last-minute changes or other updates will be posted on Blackboard. You need to wear a lab coat (you can purchase one from the campus store in the Holme building) and closed-in shoes (that fully enclose your feet and cover the tops of your feet). Bring a copy of the lab manual, which you have purchased (see above) or downloaded from Blackboard. You will be advised of any other requirements in the first week’s lab class.

**Lectures** are in large venues where you will learn from leaders in the field of biology. Make sure you attend all your timetabled lectures and do any necessary preparation beforehand. Lectures are often fast-paced (but all are recorded) so be ready for some rapid thinking.

**Stressed and need a place to relax?**
Need to work with friends on a project, or access computers and microscopes outside of class? We provide a student lounge, in room 507 on level 5 of the Carslaw building, for you to use for study and to relax with friends. There are internet-enabled computers and microscopes in this room, and you can borrow textbooks and other materials from the nearby Biology enquiries office for use in the Lizard lounge. The lounge is open from 9am – 4.30pm Mondays to Thursdays, and 9am – 12noon on Friday.
Why study biology?

As a graduate of the University of Sydney you can expect to contribute to your community in many different ways. Opportunities exist in business, government, media, education, and research. Apart from applying your biological expertise, you will be able to use other skills you developed during the course of your studies, in particular those associated with effective communication, knowledge acquisition and analysis, and team building.

Your understanding of biology will contribute to decision-making in ways that you can’t predict. We make a considerable effort to assist you to develop a broad base of skills, within a biological framework.

sydney.edu.au/science/biology/studying_biology