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UNITS OFFERED IN 2013

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GLOSSARY

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. A science degree requires the completion of 144 credit points, i.e. 48 credit points per full-time academic year.

Biology Major = a minimum of 24 credit points from senior BIOL/PLNT units of study.

For more information, visit:
Welcome to the School of Biological 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 School of Biological Sciences. Once again, congratulations on achieving a place at the University of Sydney.


Dr Charlotte Taylor
Director of First Year Biology
(charlotte.taylor@sydney.edu.au)
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. However you may prefer to take Human Biology, which focuses more narrowly on human anatomy and physiology.

In first-year, you can take up to four units of study in junior biology: Concepts in Biology (BIOL111), Living Systems (BIOL102), Human Biology (BIOL113) and Introduction to Molecular Biology and Genetics (MBLG101). 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 (BIOL211) 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 grades in MBLG101, 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
A bridging course is run for students who have not completed HSC Biology (or equivalent) at school, who need to refresh their knowledge after a break from study, or who have previously studied biology and found it difficult. Topics include cell biology, cellular reactions, reproduction, genetics, evolution, ecology, scientific writing, numeracy, biological drawing, and microscopy. Visit sydney.edu.au/science/biology/studying_biology/bridging-course.shtml for more details or contact the School Office (biosci.genericadmin@sydney.edu.au).
CONCEPTS IN BIOLOGY
BIOL1001
Concepts in Biology is an introduction to the major themes of modern biology. The unit emphasises how biologists carry out scientific investigations, from the cellular/molecular level to the level of ecosystems. Topics covered in lectures include: introductory cell biology, with particular emphasis on cell structure and function; an introduction to molecular biology through the role of DNA in protein synthesis and in the genetics of organisms; theories of evolution and phylogenetic analysis, and how they are used to interpret the origins of the diversity of modern organisms; and interactions between organisms in biological communities, with particular emphasis on Australian examples. You will build on this in practical classes with a series of laboratory-based experiments that will help you to think scientifically and design and analyse robust scientific investigations based on modern biological techniques. You will work with research scientists to apply your findings to key issues in field and lab contexts.

Credit points: 6
Teacher/coordinator: Dr 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: BIOL1901, BIOL1991
Assumed knowledge: none, however semester 1 students who have not completed HSC biology (or equivalent) are advised to take the Biology Bridging Course before semester starts
Assessment: in-semester quizzes, end-of-semester exam, laboratory reports and other laboratory components

TEXTBOOK

Textbooks can be purchased from the Co-op Bookshop (www.coop-bookshop.com.au), and are available for short-term loan from Badham 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.

“One of my favourite courses so far! Best labs and generally best lectures too.”
– Concepts in Biology student, 2012
CONCEPTS IN BIOLOGY (ADVANCED)

BIOL1911
Concepts in Biology (Advanced) builds on the main themes introduced in HSC Biology, with emphasis on current research in biology. This unit will include those topics covered in BIOL1001 but will expand on, and further explore, all theoretical and practical components at a more advanced, research-driven level.

The research-based lectures will delve deeper into the general lecture topics and include current investigations of such diverse topic areas as cancer therapies, metabolic malfunction, anarchy in beehives, evolutionary studies of snake reproductive strategies, plant phylogeny and global environmental change.

This unit is available to students who scored 80 or more in HSC Biology (or equivalent) or a Distinction or better in a University-level Biology unit or an ATAR of 95 and above.

**Credit points:** 6  
**Teacher/coordinator:** Dr 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:** in-semester quizzes, end-of-semester exam, laboratory reports and other laboratory components

“**The laboratory classes are really amazing. I learned a lot and had a lot of fun.”**

– Concepts in Biology (Advanced) student, 2012

**TEXTBOOK**
As for BIOL1001
Entry to 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. This unit builds on Concepts in Biology (Advanced) and will follow the same lectures as BIOL1911, but has a specialised and research-intensive practical component where you will extract and manipulate DNA, analyse your own DNA sequences and study the relationship between you, other humans, and a range of organisms. You will also gain experience in a forensic genetics project while learning and working with leaders in this field.

**Credit points:** 6  
**Teacher/coordinator:** Dr Simon Ho (simon.ho@sydney.edu.au) and Dr Nate Lo (nathan.lo@sydney.edu.au)  
**Session:** Semester 1  
**Classes:** two 1-hour lectures and one 3-hour practical per week  
**Pre-requisites:** 90+ in HSC biology (or equivalent), or ATAR of 99 or above, or medallist in International Biology Olympiad, or with special permission  
**Prohibitions:** BIOL1001, BIOL1911, BIOL1993  
**Assumed knowledge:** HSC biology (or equivalent)  
**Assessment:** end-of-semester exam, laboratory reports and presentations and other laboratory components  

**TEXTBOOK**  
As for BIOL1001
HUMAN BIOLOGY

BIOL1003
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 will also look 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.

Credit points: 6
Teacher/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 1-2 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
Prohibitions: BIOL1903, BIOL1993
Assumed knowledge: HSC biology (or equivalent)
Assessment: assignments, tests, and end-of-semester exam

TEXTBOOK

Textbooks can be purchased from the Co-op Bookshop (www.coop-bookshop.com.au), and are available for short-term loan from Badham 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.

“The demonstrators were really responsive and helpful in explaining the pracs and analysing the anatomy. They made sure we understood what was going on and what was expected of us.”
– Human Biology student, 2012
HUMAN BIOLOGY (ADVANCED)

BIOL1903

This unit of study is the same as BIOL1003 except that it includes a special lecture series with guest speakers from different scientific fields. The speakers present their research and a personal perspective of career paths into scientific research. The Independent Project encourages students to find out more about a human biology related topic that interests them.

Credit points: 6  Teacher/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 1-2 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 unit, or with special permission  Prohibitions: BIOL1003, BIOL1993  Assumed knowledge: HSC biology  Assessment: assignments, group project presentation, discussion activities, tests, and end-of-semester exam

TEXTBOOK

As for BIOL1003

“A great start to understanding the human body!”

– Human Biology (Advanced) student, 2012
HUMAN BIOLOGY (SPECIAL STUDIES)

BIOL1993
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. This unit builds on Human Biology (Advanced) and will follow the same lectures as in BIOL1903 but has a specialised and research-intensive practical component where you will extract and manipulate DNA, analyse your own DNA sequences and study the relationship between you, other humans, and a range of organisms. You will also gain experience in a forensic genetics project while learning and working with leaders in this field.

Credit points: 6 Teacher/coordinator: Dr Simon Ho (simon.ho@sydney.edu.au) and Dr Nate Lo (nathan.lo@sydney.edu.au) Session: Semester 1 Classes: Lectures and workshops as for BIOL1903. One 3-hour practical per week Pre-requisites: 90+ in HSC biology (or equivalent), or ATAR of 99 or above, or medallist in International Biology Olympiad, or with special permission Prohibitions: BIOL1003, BIOL1903, BIOL1991 Assumed knowledge: HSC biology (or equivalent) Assessment: end-of-semester exam, laboratory reports and presentations and other laboratory components

TEXTBOOK
As for BIOL1003
LIVING SYSTEMS

BIOL1002
Living Systems deals with the biology of organisms as individuals, within populations and as part of communities and ecosystems. A broad range of taxa are covered, 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.

Credit points: 6
Teacher/coordinator: Dr Will Figueira (will.figueira@sydney.edu.au)
Session: Semester 2
Classes: two 1-hour lectures and one 3-hour practical per week
Pre-requisites: none, however students who have not completed HSC biology (or equivalent) are advised to take the Biology Bridging Course before semester 1 starts
Prohibitions: BIOL1902
Assumed knowledge: HSC biology (or equivalent)
Assessment: assignments, quizzes and end-of-semester exam

TEXTBOOK

Textbooks can be purchased from the Co-op Bookshop (www.coop-bookshop.com.au), and are available for short-term loan from Badham 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.

“I enjoyed the use of real locations, animals and situations.”
– Living Systems student, 2012
LIVING SYSTEMS (ADVANCED)

BIOL1902
Living Systems (Advanced) builds on the main themes introduced in HSC Biology, with emphasis on current research in biology. This unit will include those topics covered in BIOL1002 but will expand on, and further explore, all theoretical and practical components at a more advanced, research-driven level.

The research-based lectures will delve deeper into the general lecture topics and include current investigations of such diverse topic areas as the interactive effects of environmental processes on the physiology of organisms, the evolution and ecological impacts of neurotoxins and the conservation biology and management of endangered species.

Credit points: 6 Teacher/coordinator: Dr Will Figueira (will.figueira@sydney.edu.au) Session: Semester 2 Classes: two 1-hour lectures and one 3-hour practical per week Pre-requisites: 90+ in HSC biology (or equivalent), ATAR of 95 or above, distinction or above in BIOL1**1, or with special permission Prohibitions: BIOL1002 Assumed knowledge: HSC biology (or equivalent) Assessment: assignments, quizzes and end-of-semester exam

TEXTBOOK
As for BIOL1002

“This course was very hands on and it was good to learn new techniques to do with ecology.”
– Living Systems (Advanced) student, 2012
INTRODUCTION TO MOLECULAR BIOLOGY AND GENETICS

MBLG1001

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 of the flow of genetic information via 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. A key aim of the practicals is to give students higher-level skills in computing, communication, criticism, data analysis/evaluation and experimental design.

Credit points: 6
Teacher/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
Assumed knowledge: 6 credit points of junior biology and 6 credit points of junior chemistry

Assessment: in-semester assignments, skills test and end-of-semester exam

TEXTBOOK

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. It incorporates Principles of Biochemistry (Horton, Moran, Scimgeour, Perry & Rawn) and Concepts of Genetics (Klug, Cummings, Spencer & Palladino).
INTRODUCTION TO MOLECULAR BIOLOGY AND GENETICS (ADVANCED)

MBLG1901
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 some advanced lectures (replacing selected regular lectures) and advanced laboratory sessions (replacing 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.

Credit points: 6 Teacher/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 with special permission

Prohibitions: MBLG1001, AGCH2001, BCHM2001, BCHM2101, BCHM2901, MBLG2101, MBLG2901, MBLG2001, MBLG2111, MBLG2771, MBLG2871 Assumed knowledge: HSC chemistry and biology (or equivalent), or 6 credit points of junior biology and 6 credit points of junior chemistry Assessment: in-semester assignments, skills test and end-of-semester exam

TEXTBOOK
As for MBLG1001
To be eligible for this high-level course you must have an ATAR score (or equivalent) of at least 99, or 90+ in HSC Biology (or equivalent), or be a medallist in the Biology International Olympiad.

Do you want to analyse your own DNA? Try your hand at modern molecular techniques? Do you love Biology!?

If the answer is ‘yes’ then why not enrol in one of our special units: Concepts in Biology (Special Studies) or Human Biology (Special Studies). The fundamental difference between our Special Studies Program and the Concepts in Biology (Advanced) and Human Biology (Advanced) units is that the practical sessions are specifically designed to challenge and inspire high achieving students and students with a strong interest in biology. [More information on pages 6 and 9]

sydney.edu.au/science/biology/studying_biology/undergraduate-junior.shtml#special
Are you a bright high-achiever looking for an accelerated start in biological research?

If you’re part of the Talented Students 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. Please contact the Talented Student Program (TSP) coordinator, Associate Professor Dieter Hochuli (dieter.hochuli@sydney.edu.au) to register your interest.

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.

“Our project was very hands-on. We got the opportunity to participate in real research in our first semester at uni. This was a really exciting project as little is known about this new red-shifted chlorophyll due to its recent discovery.”

THE LOGISTICS

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 (sydney.edu.au/science/biology/studying_biology) and from the university’s eLearning system, once you are enrolled.

eLearning at Sydney University: Before the first week of semester, you will be provided access to the University’s eLearning system (called Blackboard, accessible at elearning.sydney.edu.au). 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!

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 ([www.coop-bookshop.com.au](http://www.coop-bookshop.com.au), with textbooks for all units as well as course notes for MBLG1*01) or from the University Copy Centre ([sydney.edu.au/ups/ucc](http://sydney.edu.au/ups/ucc), which sells course notes for BIOL1***). Both are on-campus and located close to the Sports and Aquatic Centre.

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 Wentworth 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.
LIZARD LOUNGE

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 – 4.45pm Mondays to Thursdays, and 9am – 12noon on Friday.

BIO-SOC

Bio-Soc is the School of Biological Sciences’ student society. It is dedicated to fostering biological activities and interests for biology students and the wider community. The society organises social events throughout the year including lunchtime BBQs, cocktail parties, bush walks and trips to the school’s Pearl Beach field station (Warrah) on the Central Coast.

Find out what it’s like to be a biologist. Volunteering gives you the opportunity to participate in real research. You can start out simply helping an academic, a junior researcher or a PhD student setting up experiments or analysing data; then end up running your own research project. Several of our previous volunteers actually had their names on research papers.

“I found volunteering to be a great experience. I had the opportunity to meet and work alongside postgraduate students and senior researchers who were conducting original research. It was a rewarding experience to learn lab skills from them, and also to see real-life applications of the theories and techniques introduced in lectures and lab classes.”

- Craig Coorey, volunteer

For more information, please visit: sydney.edu.au/science/biology/student_opportunities/
An honours year gives you the chance to refine your biological knowledge and research skills by working in the research community.

As a biology student, you are strongly encouraged to specialise by continuing into the honours (fourth) year. You complete advanced course material and an independent research project that culminates in a thesis. Entry into honours is competitive and depends on your performance in second and third year units of study.

“Doing honours was a great way to prove my capacity for independent research”
– Ryan Keith, Honours student, 2012

“Honours gave me experience in problem solving, project management and analytics. Plus it improved my communication skills and I had a blast!”
– Jessica Higgs, Honours student, 2009
## PATHWAYS TO STUDYING BIOLOGY

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<th>INTERMEDIATE/SENIOR</th>
<th>SENIOR</th>
<th>HONOURS (OPTIONAL)</th>
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<td>(Intro to) Tropical Wildlife Biology ODD*</td>
<td>Systematics &amp; Evolution</td>
<td>Biology Honours</td>
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<td>Human Biology</td>
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<td>Ecology &amp; Conservation</td>
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<td>Plant cells, Development &amp; Environment</td>
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### Planning for a Biology major
For students planning to major in Biology we recommend 12 credit points of junior BIOL, MBLG1001 and 6 credit points of Junior Chemistry. However, there are many alternative pathways to a Biology major.

### Requirements for Biology major
For a major in Biology, the minimum requirement is 24 credit points from senior BIOL/PLNT units of study listed in this subject area.

*EVEN units run in 2014, 2016,...; ODD units run in 2013, 2015,...