



INFORMATION  
FOR STUDENTS  
CONSIDERING  
INTERMEDIATE  
(SECOND YEAR)  
UNITS OF STUDY

SCHOOL OF  
BIOLOGICAL  
SCIENCES



THE UNIVERSITY OF  
SYDNEY

# INTERMEDIATE BIOLOGY 2012

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For further information, consult the School of Biological Sciences  
Web site: <http://sydney.edu.au/science/biology>

*Note that the units of study described here are relevant to current Intermediate students only and will not be available in 2013. The 2013 Intermediate curriculum will be posted towards the end of Semester 1, 2012. Prospective students needing further information may contact Dr Elizabeth May: [elizabeth.may@sydney.edu.au](mailto:elizabeth.may@sydney.edu.au).*

## HOW TO SELECT YOUR INTERMEDIATE UNITS OF STUDY

The School of Biological Sciences offers Intermediate units of study in animal biology, cell biology, entomology, ecology and marine biology (BIOL units). In addition, the School of Biological Sciences collaborates with the School of Molecular Bioscience to offer units in molecular biology & genetics (MBLG units) and with the Faculty of Agriculture, Food and Natural Resources to offer units in plant science (PLNT units).

### Units of study

The following units of study have been designed to develop practical skills as well as provide a theoretical understanding of the subject. Each unit is 6 credit points and lasts one semester. At least 12 credit points from these units of study are needed to continue into most Senior Biology units.

BIOL2011/2911	Invertebrate Zoology
BIOL2012/2912	Vertebrates and their Origins
BIOL2016/2916	Cell Biology
BIOL2017/2917	Entomology
BIOL2018/2918	Introduction to Marine Biology
ENVI2111/2911	Conservation Biology & Applied Ecology
MBLG2071/2971	Molecular Biology and Genetics A
MBLG2072/2972	Molecular Biology and Genetics B
PLNT2001/2901	Plant Biochemistry and Molecular Biology
PLNT2002/2902	Australian Flora: Ecology & Conservation
PLNT2003/2903	Plant Form and Function

### Advanced units of study

Each of the units of study has an Advanced version, offering more independent means of achieving the unit of study objectives. Entry is restricted and normally requires a Distinction grade in the prerequisite Biology units. Advanced units of study are most suitable for students considering Honours or postgraduate research in Biology. Advanced units are denoted by a 9 as the second digit in the unit of study code, e.g. BIOL2911 Invertebrate Zoology (Advanced).

### Degree requirements

To complete a Bachelor's degree you will need to complete at least 144 credit points. The Bachelor of Science degree requires:

- 12 credit points in Mathematics and Statistics;
- at least 24 credit points of Junior Science units in at least two Science subject areas;
- at least 84 credit points of Intermediate (second year) and Senior (third year) units of study;
- a major comprising at least 24 credit points of Senior (third year) units of study in one Science subject area.

### Selecting Intermediate units of study

In general, it is necessary to have passed 12 credit points of Junior Biology to be eligible for Intermediate Biology. As you select your Intermediate units of study, check that:

- you have passed the pre-requisites stated for each of the units chosen (page 3);
- the timetables for the Intermediate Biology units of study that you have selected do not clash;
- your unit of study choices satisfy the minimum requirements for your desired major.

For several BIOL and PLNT units you need to have completed 12 credit points of Junior Biology and 12 credit points of Junior Chemistry. Prerequisites for Intermediate MBLG units include MBLG1001 and 12 credit points of Junior Chemistry. Under special circumstances it is possible to take a unit of study without having completed a prerequisite. This would usually involve enrolling concurrently in the prerequisite unit, and requires permission from the relevant unit coordinator.

### Think about prerequisites for Senior (third year) units of study

The School of Biological Sciences offers Senior units of study in sixteen subject areas. If you wish to enrol in Senior units, you must have completed the Intermediate prerequisite units of study for the Senior units of study you intend taking. A table showing the prerequisites for Senior units of study is included on page 5.

## Planning for your major

### Biology Major

For a major in Biology, the minimum requirement is 24 credit points from Senior Biology units of study (page 5 lists the prerequisites for each Senior unit of study). Senior PLNT units and BIOL 3009/3909 and BIOL 3017/3917 may be counted towards a major in either Biology or Plant Science, with the proviso that any unit may be counted only once. Students intending to major in Biology should take at least 12 credit points of Intermediate Biology.

### Marine Biology major

For a major in Marine Biology, the minimum requirement is 24 credit points of Senior BIOL units listed under Table 1 for marine science in the Faculty of Science Handbook (marked MS on page 5 of this booklet).

### Marine Science major

For a major in Marine Science, the minimum requirement is 24 credit points from Senior Marine Science (BIOL or GEOS) units of study, including at least 6 credit points of Senior BIOL (marked MS on page 5 of this booklet) and 6 credit points of Senior GEOS units.

*(It is recommended to prepare for either a Marine Biology or Marine Science major that a student complete 12 credit points of Junior Biology, 12 credit points of Junior Chemistry and 12 credit points of Junior Geosciences.)*

### Plant Science major

For a major in Plant Science, the minimum requirement is 24 credit points from Senior units of study listed in the following subject areas, which *must* include a minimum of 12 credit points of Senior PLNT units.

PLNT3001/3901	Plant, Cell and Environment	PPAT3003	Plant Disease
PLNT3002/3902	Plant Growth and Development	HORT3005	Production Horticulture
PLNT3003/3903	Systematics and Evolution of Plants	AGRO3004	Managing Agro-Ecosystems
BIOL3009/3909	Terrestrial Field Ecology		
BIOL3017/3917	Fungi in the Environment		

## Think about requirements for going on to Honours

Students wishing to enrol in Biology Honours must have satisfied all the requirements for a pass degree and be considered by the Honours Executive Committee and Head of School to have the required aptitude and knowledge for Honours. A prospective Honours student will have:

- a major in one of the Life Sciences (not necessarily Biology)
- an average grade of at least Credit in 12 or more credit points of Senior Life Sciences subjects
- an AAM (average annual mark) of 65 for all Intermediate and Senior units of study attempted<sup>1</sup>

For further information, visit <http://sydney.edu.au/science/biology> and go to Studying Biology/Honours.

## Unit of study manuals and Blackboard

Students will need to purchase the relevant manual for each unit of study from the University Copy Centre (Noel Martin Building). All students in Intermediate Biology will also require an Intermediate Skills Manual, which can be downloaded from the School Generic Skills site: [http://sydney.edu.au/science/biology/learning/generic\\_skills](http://sydney.edu.au/science/biology/learning/generic_skills)

All intermediate Biology units of study are supported by a Blackboard elearning site. Students will have access to the relevant sites once they have successfully enrolled in a unit of study.

### Further advice

You are strongly advised to read the information outlines for each of the units of study in the following pages and if you need further advice you are welcome to discuss your selection of units of study with the relevant Executive Officer, in the first instance, or with Dr Elizabeth May\*, to confirm that the combination of units of study is appropriate and possible, and to ensure you have all of the necessary prerequisites.

\* Dr May is coordinator of second and third year studies. ☎ 9351 4482 ✉ [elizabeth.may@sydney.edu.au](mailto:elizabeth.may@sydney.edu.au)

#### <sup>1</sup> Annual average mark (AAM) (from Faculty of Science Handbook)

The average mark over all units of study attempted in a given academic year (equivalent to the calendar year). The formula for this calculation is:  $\Sigma (\text{marks} \times \text{credit point value}) / \Sigma (\text{credit point value})$  (Sums over all units of study completed in the selected period.) The mark is the actual mark obtained by the student for the unit of study, or in the case of a failing grade with no mark – 0. Pass/fail assessed subjects and credit transfer subjects (from another institution) are excluded from these calculations. However, the marks from all attempts at a unit of study are included.

## INTERMEDIATE (2<sup>ND</sup> YEAR) UNITS OF STUDY IN BIOLOGY - 2012

For students intending to major in Biology, completion of 6 cp of MBLG units (including MBLG1001) is highly recommended

**Advanced versions** of all the following units of study are available. Entry requirements are similar to those for the equivalent unit, but performance in Junior Biology must be at Distinction level. All units of study are 6 credit points.

UNIT OF STUDY	Semester	PREREQUISITES
BIOL2011 INVERTEBRATE ZOOLOGY	1	BIOL (1001 or 1911) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH). 12 credit points of Junior Chemistry. ★
BIOL2012 VERTEBRATES AND THEIR ORIGINS	2	BIOL (1001 or 1911) and 6 additional credit points of Junior Biology (BIOL/ MBLG/EDUH). 12 credit points of Junior Chemistry. ★
BIOL2016 CELL BIOLOGY	1	12 credit points of Junior Biology (BIOL/MBLG/EDUH). 12 credit points of Junior Chemistry.*
BIOL2017 ENTOMOLOGY	2	BIOL (1001 or 1911) and 6 additional credit points of Junior Biology (BIOL/ MBLG/EDUH). 12 credit points of Junior Chemistry. ★
BIOL2018 INTRODUCTION TO MARINE BIOLOGY	2	BIOL (1001 or 1911) and 6 additional credit points of Junior Biology (BIOL/ MBLG/EDUH). 12 credit points of Junior Chemistry. ★
ENVI2111 CONSERVATION BIOLOGY & APPLIED ECOLOGY	1	BIOL (1001 or 1911) and 6 additional credit points of Junior Biology (BIOL/ MBLG/EDUH). ★
PLNT 2001 PLANT BIOCHEMISTRY & MOLECULAR BIOLOGY	1	12 credit points of Junior Chemistry and 12 credit points of Junior Biology.
PLNT 2002 AUSTRALIAN FLORA: ECOLOGY & CONSERVATION	1	6 credit points from any Junior unit of study.
PLNT 2003 PLANT FORM & FUNCTION	2	12 credit points of Junior Biology, or equivalent, e.g. BIOL (1001 or 1911) and BIOL (1002 or 1902 or 1003 or 1903). ★
MBLG 2071 MOLECULAR BIOLOGY & GENETICS A	1	MBLG (1001 or 1901) and 12 credit points of Junior Chemistry. ‡
MBLG 2072 MOLECULAR BIOLOGY & GENETICS B	2	BIOL (1001 or 1911 or 1003 or 1903) + MBLG 1001 or 1901; and 12 credit points of Junior Chemistry. Advanced unit MBLG 2972 – Distinction in MBLG (2071 or 2971).

★ The contents of BIOL (1002 or 1902) is assumed knowledge. Students wishing to enrol in Intermediate Biology (BIOL) and Plant Science (PLNT) units of study without BIOL (1002 or 1902) will need to do some preparatory reading.

‡ MBLG2071/2971: Students enrolled in the combined BAppSc (Exercise and Sport Science)/BSc(Nutrition) must have completed all Junior units for this course prior to enrolling in this unit.

## INTERMEDIATE BIOLOGY LECTURE & LABORATORY TIMETABLES

**N.B.** These times are accurate at the time of printing. It is recommended that students confirm timetable details before the start of each semester on MyUni. Practical class and tutorial times are alternatives in each week. Students will be assigned to specific classes by central timetabling. Please check your personal timetable for your allocated class times.

UNIT (class type/wk)	S	LECTURES (L) (Students attend all times)					PRACTICALS (P) / TUTORIALS (T) (Students attend one prac and one tut time only)				
		Mon	Tues	Wed	Thur	Fri	Mon	Tues	Wed	Thur	Fri
BIOL2011/2911 (3/2L*; 2P; 1T*)	1		10-11	11-12	10-11*			P 2-4	T 9-10* T 11-12*	T 11-12* P 2-4	
BIOL2016/ 2916 (2L; 1P)	1	11-12		12-1				P 2-6	P 2-6		
ENVI2111/2911 (2L; 1P; field trips <sup>A</sup> )	1		1-2		1-2				P 2-5		
PLNT2001/2901 (3L; 1P)	1	9-10		9-10		9-10				P 10-1	
PLNT2002/2902 (2L; 1P; field trip <sup>A</sup> )	1		9-10		9-10			P 2-5	P 2-5		
MBLG2071/2971 (2L; 1P; T <sup>C</sup> )	1			8-9 or 10-11		8-9 or 10-11		P 1-6 <sup>B</sup>	T 10-11 <sup>C</sup> T 11-12 <sup>C</sup> P 1-6 <sup>B</sup>	T 11-12 <sup>C</sup> T 12-1 <sup>C</sup> P 1-6 <sup>D</sup>	
BIOL2012/2912 (3/2L*; 2P; 1T*)	2		10-11	11-12	10-11*			P 2-4	T 9-10* T 11-12*	T 11-12* P 2-4	
BIOL2017/2917 (2L, 1P)	2	1-2			1-2			P 2-5			
BIOL 2018/ 2918 (3L; field trips <sup>A</sup> )	2	10-11		10-11				P/T* <sup>F</sup> 1-6			
PLNT2003/2903 <sup>E</sup> (2L; 1P; 1T; field trip)	2		9-10		9-10			T 11-12 P 2-5	T 11-12 or T 12-1 P 2-5		
MBLG2072/292 (2L; 1P; 1T*)	2	11-12				11-12		T 11-12* or T 12-1* P 2-5	T 10-11* P 2-5		

**Notes:**

\* alternate weeks.

<sup>A</sup> note that excursions for BIOL2018/2918 and ENVI211/2911 may involve weekends during semester.

<sup>B</sup> MBLG2071 labs Tuesday or Thursday in odd or even weeks.

<sup>C</sup> tutorials for MBLG2071/2971 are optional and will not appear on your individual timetable.

<sup>D</sup> MBLG2971 labs only, on Friday of even weeks.

<sup>E</sup> PLNT2003/2903 includes non-timetabled self-directed audiovisual lab sessions in Ashby AV Laboratory.

<sup>F</sup> BIOL2018/2918: practicals and tutorials will be on different weeks, according to tides (a field trip on the Tuesday of Week 3 may also be scheduled).

## SENIOR (3<sup>RD</sup> YEAR) UNITS OF STUDY IN BIOLOGY - 2012

\* Advanced versions of all units of study are available. Entry requirements are similar to those for the equivalent unit, but performance in Intermediate Biology must be at Distinction level. All units of study are 6 credit points. (SEM – Semester)

UNIT OF STUDY	SEM	PREREQUISITES
BIOL3010 (and Advanced)* TROPICAL WILDLIFE BIOLOGY & MANAGEMENT	‡‡	12 credit points of Intermediate Biology (BIOL/ENVI/PLNT).
BIOL3017 (and Advanced)* FUNGI IN THE ENVIRONMENT	‡	12 credit points of Intermediate Biology or Plant Science; or 6 credit points of Intermediate Biology or Plant Science and 6 Intermediate credit points of either Microbiology or Geography.
BIOL3006 (and Advanced)* ECOLOGICAL METHODS (MS)	1	12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and one of ENVI (2111 or 2911) or GEOS (2115 or 2915).
BIOL3011 (and Advanced)* ECOPHYSIOLOGY (MS)	1	12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and one of ENVI (2111 or 2911) or GEOS (2115 or 2915).
BIOL3012 (and Advanced)* ANIMAL PHYSIOLOGY	1	12 credit points of Intermediate Biology.
BIOL3013 (and Advanced)* MARINE BIOLOGY (MS)	1	12 credit points of Intermediate Biology, or 6 credit points of Intermediate BIOL and one of ENVI (2111 or 2911) or GEOS (2115 or 2915).
BIOL3018 (and Advanced)* APPLICATIONS OF RECOMBINANT DNA TECHNOLOGY	1	12 credit points from MBLG (2071/2971), MBLG (2072/2972), and Intermediate Biology units. For BMedSc students: 36 credit points of Intermediate BMED units including BMED 2802.
PLNT3003 (and Advanced)* SYSTEMATICS & EVOLUTION OF PLANTS	1	6 credit points from any Intermediate unit of study from BIOL, PLNT, LWSC, HORT, GEOS, GEOG, ENVI, SOIL.
BIOL3008 (and Advanced)* MARINE FIELD ECOLOGY (MS)	§§	12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and one of ENVI (2111 or 2911) or GEOS (2115 or 2915).
BIOL3009 (and Advanced)* TERRESTRIAL FIELD ECOLOGY	§	12 credit points of Intermediate Biology (BIOL/MBLG/PLNT/ENVI), or ANSC2004 and BIOM2001.
BIOL3016 (and Advanced)* CORAL REEF BIOLOGY (MS)	§§§	12 credit points from Intermediate science units of study, which must include at least 6 credit points of BIOL units; or 6 credit points of BIOL and one of ENVI (2111 or 2911) or GEOS (2115 or 2915).
BIOL3007 (and Advanced)* ECOLOGY (MS)	2	12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL, and one of ENVI (2111 or 2911) or GEOS (2115 or 2915).
BIOL3025 (and Advanced)* EVOLUTIONARY GENETICS & ANIMAL BEHAVIOUR	2	12 credit points from MBLG (2071/2971), MBLG (2072/2972), and Intermediate Biology (or PLNT) units. For BMedSc students: 36 credit points of Intermediate BMED units including BMED 2802. (It is not a requirement (but encouraged) for students to have completed any MBLG unit prior to enrolling in BIOL3025/3925.)
BIOL3026 (and Advanced)* DEVELOPMENTAL GENETICS	2	12 credit points from MBLG (2071/2971) and MBLG (2072/2972). For BMedSc students: 36 credit points of Intermediate BMED units including BMED2802.
PLNT3001 (and Advanced)* PLANT, CELL & ENVIRONMENT	2	12 credit points of Intermediate Biology, Plant Science, Molecular Biology & Genetics or equivalent.
PLNT3002 (and Advanced)* PLANT GROWTH & DEVELOPMENT	2	12 credit points of Intermediate PLNT, BIOL, AGCH or CROP units of study including at least one of PLNT (2001 or 2901 or 2003 or 2903), BIOL (2016 or 2916), CROP2001, AGCH2002.

### TIMETABLE & DATES - PRE-SEMESTER UNITS OF STUDY - 2012

Code	Unit of study	Dates	Component
‡	BIOL3010/3910	<b>Feb 19 - 24</b> <b>Feb 27 - Mar 2</b>	Intensive 5 day field-based course in Northern Territory, followed by: Tutorials and practical classes at University of Sydney.
‡‡	BIOL3017/3917	<b>Feb 20 - Mar 2</b>	Each morning (9 - 1) at University of Sydney (plus the equivalent of 30 hours self-guided study during semester 1)
§	BIOL3008/3908	<b>Jun 30 – Jul 8</b>	Intensive 8 day field-based course
§§	BIOL3009/3909	<b>Jul 22 - 27</b> <b>Wk 1 – 4, S2</b>	Intensive 6 day field-based course, followed by: 4 practical classes during weeks 1 - 4 in Semester 2
§§§	BIOL3016/3916	<b>Jul 9 - 16</b>	Intensive field-based course on One Tree Island, Great Barrier Reef.

Further information about Senior units of study is available at:

[http://sydney.edu.au/science/biology/studying\\_biology/undergraduate-senior.shtml](http://sydney.edu.au/science/biology/studying_biology/undergraduate-senior.shtml)

# BIOL2011/2911 INVERTEBRATE ZOOLOGY

## BIOL2011 INVERTEBRATE ZOOLOGY

Semester 1

**Prerequisites:** BIOL (1001 or 1911) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH).  
12 credit points of Junior Chemistry.

**Note:** The content of BIOL (1002 or 1902) is assumed knowledge and students entering without BIOL (1002 or 1902) will need to do some preparatory reading.

**Prohibition:** May not be counted with BIOL2911

## BIOL2911 INVERTEBRATE ZOOLOGY (ADVANCED)

**Prerequisites:** As for BIOL2011 plus Distinction average in 12 credit points of Junior Biology. These requirements may be varied and students with lower averages should consult the unit coordinator.

**Description:** This unit of study has the same objectives as BIOL2011 Invertebrate Zoology. Students taking this unit of study will be exempt from some elements of the standard BIOL2011 Invertebrate Zoology unit of study, and will be required to pursue the unit of study objectives by more independent means. The nature of this unit of study varies from year to year, and students will be given more information before the unit of study runs. Students must be enrolled in both BIOL2911 and BIOL2912 to be eligible to take part in the advanced unit of study.

**Prohibition:** May not be counted with BIOL2011

**Lecturers:** Dr Elizabeth May A/Professor Frank Seebacher Dr Fiona Clissold

**Unit of Study Objective:** The purposes of this unit of study are to develop an understanding of the diversity of animals and to develop the skills used in the study of animal diversity.

### Unit of Study Description

BIOL2011 Invertebrate Zoology aims to communicate an understanding of the diversity of animals and how that diversity evolved. It is designed to be taken with BIOL2012 Vertebrates and their Origins for students who wish to continue with animal biology in Senior Biology. There is major emphasis on the practical skills, including dissection, involved in understanding the evolution of the morphology, physiology and reproduction of the majority of invertebrate animals.

Lectures provide an introduction to phylogenetic reconstruction, the evolution of multicellularity, Porifera, Cnidaria, Platyhelminthes, Nematoda, Annelida, Mollusca, Crustacea, Chelicerata and Hexapoda. In practical classes, students examine the structure and anatomy of representatives of the major phyla by observation and dissection. Skills of dissection and recording are emphasised. Tutorials are run every fortnight. Emphasis will be placed on the revision of taxa covered in lectures and the development of skills, including oral and written communication skills and the effective use of library resources.

**Assessment:** 1 x 1-hr mid-semester test (10%); 1 x 2-hr theory exam (30%); 1 x 1.5-hr practical exam (30%); assignment (5%); oral presentation (5%); essay (20%) (BIOL2011 only); literature review (20%) (BIOL2911 only)

### Textbook

Anderson, D.T. (2001) *Invertebrate Zoology. 2nd Edition*. Oxford University Press: Melbourne.

### Other reading

Anderson, D.T. (1996) *Atlas of Invertebrate Anatomy. 2nd Edition*. UNSW Press: Kensington, NSW.

Barnes, R.S.K., Calow, P., Olive, P.J.W. (1993) *Invertebrates: a new synthesis. 2nd Edition*. Blackwell: London.

Brusca, R.C., Brusca, G.J. (2003) *Invertebrates. 2nd Edition*. Sinauer: Sunderland, Massachusetts.

Freeman, W.H., Bracegirdle, B. (1971) *An Atlas of Invertebrate Structure*. Heinemann Educational Books. London.

Ruppert, E.E., Fox, R.S., Barnes, R.D. (2004) *Invertebrate Zoology. 7th Edition*. Brooks/Cole: Belmont, CA.

**UNIT COORDINATOR:** Dr Elizabeth May

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## BIOL2012/2912 VERTEBRATES & THEIR ORIGINS

### BIOL2012 VERTEBRATES & THEIR ORIGINS

Semester 2

**Prerequisites:** BIOL (1001 or 1911) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH). 12 credit points of Junior Chemistry.

**Note:** The content of BIOL (1002 or 1902) is assumed knowledge and students entering without BIOL (1002 or 1902) will need to do some preparatory reading.

**Prohibition:** May not be counted with BIOL2912

### BIOL2912 VERTEBRATES & THEIR ORIGINS (ADVANCED)

**Prerequisites:** As for BIOL2012 plus Distinction average in 12 credit points of Junior Biology. These requirements may be varied and students with lower averages should consult the unit coordinator.

**Description:** This unit of study has the same objectives as BIOL2012 Vertebrates and their Origins. Students taking this unit of study will be exempt from some elements of the standard BIOL2012 Vertebrates and their Origins unit of study, and will be required to pursue the unit of study objectives by more independent means. The nature of this unit of study varies from year to year, and students will be given more information before the unit of study runs. Students must be enrolled in both BIOL2911 and BIOL2912 to be eligible to take part in the advanced unit of study.

**Prohibition:** May not be counted with BIOL2012.

**Lecturers:** Dr Elizabeth May, Professor Michael Thompson, A/Professor Clare McArthur, Professor Chris Dickman

**Unit of Study Objective:** The purposes of this unit of study are to develop an understanding of the diversity of animals and to develop the skills used in the study of animal diversity.

#### Unit of Study Description

BIOL2012 Vertebrates and their Origins aims to complete the understanding initiated in BIOL2011 Invertebrate Zoology of the diversity of animals and how that diversity evolved. It is designed for students who wish to continue with animal biology in Senior Biology. There is major emphasis on the practical skills, including dissection, involved in understanding the evolution of the morphology, physiology and reproduction of the major groups of deuterostome animals.

Lectures and practical classes examine lophophorates, echinoderms, protochordates, fishes, adaptations to life on land, amphibians, reptiles, birds and mammals. In practical classes, students examine the diversity and anatomy of representatives of the major phyla by observation and dissection. Skills of dissection and recording are emphasised. Tutorials are run every fortnight. Emphasis will be placed on the revision of taxa covered in lectures and the development of skills, particularly oral and written communication skills.

Students are invited to attend a 3-day field excursion at the Crommelin Research Station (Warrah) at Pearl Beach, NSW. This takes place in the mid-year break. Approximate cost to each student is \$60. **The field course is in the vacation prior to the beginning of Semester 2. Students wishing to attend the field excursion must contact the unit coordinator by Week 10 of Semester 1. Those students who do not attend the field course will complete a poster assignment in Semester 2.**

**Assessment:** 1 x 1-hr mid-semester test (10%); 1 x 2-hr theory exam (30%); 1 x 1.5-hr practical exam (25%); field trip or poster (10%); oral presentation (5%); essay (BIOL2012 only) (20%); research report and poster (BIOL2912 only) (20%)

#### Textbooks

Anderson, D.T. (2001) *Invertebrate Zoology. 2nd Edition*. Oxford University Press: Melbourne.

Kardong, K.V. (2012) *Vertebrates. 6th Edition*. McGraw Hill: Boston.

#### Other reading

Brusca, R.C, Brusca, G.J. (2003) *Invertebrates. 2nd Edition*. Sinauer Associates: Sunderland, Massachusetts.

Pough, F.M, Janis, C.M, Heiser, J.B. (2009) *Vertebrate Life. 8th Edition*. Pearson: San Francisco.

**UNIT COORDINATOR:** Dr Elizabeth May

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# BIOL2016/2916 CELL BIOLOGY

## BIOL2016 CELL BIOLOGY

Semester 1

**Prerequisites:** 12 credit points of Junior Biology (in addition to BIOL units, MBLG1001, MBLG1901 and EDUH1016 count as Junior Biology), 12 credit points of Junior Chemistry.

*Completion of MBLG1001 is highly recommended.*

**Prohibition:** May not be counted with BIOL2916

## BIOL2916 CELL BIOLOGY (ADVANCED)

**Prerequisites:** As for BIOL2016 plus Distinction average required in 12 credit points of Junior Biology.

**Description:** This unit of study has the same objectives as BIOL2016 Cell Biology but is targeted at students who wish to pursue certain aspects of Cell Biology in greater depth and by more independent means. The nature of this unit of study varies from year to year, and students will be given more information before the unit of study runs.

**Prohibition:** May not be counted with BIOL2016

**Lecturers:** Dr Murray Thomson    A/Professor Jan Marc    Professor Robyn Overall

**Unit of Study Objectives:** Students will develop skills in the theory and practise of studying eukaryotic cells and how these relate to the structure and function of whole organisms. The unit places special emphasis on contemporary research techniques and students will receive in depth training using modern laboratory research equipment.

When you have successfully completed this unit of study you should:

- be able to recall the major structural and functional components of eukaryotic cells
- understand the principal differences between protistan, plant, animal and fungal cells
- be familiar with the microscopy, molecular and immunological techniques that are most widely used in the study of cell structure and cell function, and to have developed basic skills in these techniques
- have basic understanding of developmental processes
- be able to apply a cellular perspective to developmental or physiological processes
- be able to participate with confidence in an informed discussion about cell biology
- be properly equipped to participate in more advanced units of study involving cell biology or developmental biology

### **Unit of Study Description:**

This unit of study focuses on contemporary principles in cell biology and development in plant and animals, with emphasis on cellular functions and favouring the molecular perspective. Topics include cancer and control of cell division and migration, pre-programmed cell death, molecular signalling and transport systems, cellular endocrinology and embryonic development. The practical component provides students with hands-on training in key industry techniques using modern equipment and is therefore of immense benefit to students contemplating honours study or a career in molecular and cellular research. The unit of study is designed to complement intermediate Molecular Biology and Genetics units and leads ideally to various senior units of study in biology, including Plant Growth & Development, Applications of Recombinant DNA Technology, Evolutionary Genetics & Animal Behaviour, Fungi in the Environment, Animal Physiology, as well as senior units of study in biochemistry.

**Assessment:** 1 x 3-hr theory exam, 1 project assignment, 1 practical report

### **Textbooks**

Alberts, B., Johnson A., Lewis, J., Raff, M., Roberts, K., Walter, P. (2007) *Molecular Biology of the Cell. 5th edition.* Garland Science

**UNIT COORDINATOR:** Dr Murray Thomson

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# BIOL2017/2917 ENTOMOLOGY

## BIOL2017 ENTOMOLOGY

Semester 2

**Prerequisites:** BIOL (1001 or 1911) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH).  
12 credit points of Junior Chemistry.

**Note:** BIOL (2011 or 2911) is assumed knowledge and students entering without BIOL (2011 or 2911) will need to do some preparatory reading.

**Prohibition:** May not be counted with BIOL2917

## BIOL2917 ENTOMOLOGY (ADVANCED)

**Prerequisites:** As for BIOL2017 plus Distinction average in 12 credit points of Junior Biology. These requirements may be varied and students with lower averages should consult the unit coordinator.

**Description:** This unit of study has the same objectives as BIOL2017 Entomology. Students taking this unit of study will participate in alternative components of BIOL2017. The contents and nature of this unit of study may vary from year to year.

**Prohibition:** May not be counted with BIOL2017.

**Lecturers:** A/Professor Dieter Hochuli    Professor Steve Simpson    A/Professor Madeleine Beekman

**Unit of Study Objective:** The purpose of this unit is to develop an understanding of the scientific approach to entomology, with emphases on insect structural diversity, identification, behaviour, life history and conservation. The unit is underpinned by research-led teaching, creating opportunities to examine current issues in entomology as well as fundamental aspects of entomology.

When you have successfully completed this unit, you should be able to:

- demonstrate familiarity with major groups of insects
- collect, identify, and survey insects
- analyse and explain key entomological concepts working from primary sources
- develop an experimental approach to answering basic entomological questions
- demonstrate a detailed understanding of cutting edge research in insect sociality and behaviour

### **Unit of Study Description:**

This is a general introduction to insect biology taught in three integrated modules. The first module examines morphology, classification, life histories and development, physiology, ecology, behaviour, conservation, and the biology of prominent members of major groups. The other two modules examine new developments in entomological research, focusing on research strengths at the University of Sydney: the biology of social insects and insect behaviour.

The practical classes give students a working knowledge of the major orders of insects and species of importance, as well as principles of collection, preservation and identification. Project work considers forensic entomology, learning in social insects and insect behaviour. A field trip to the zoo will also consider insect husbandry and the role of insects in education.

There will also be an introduction to entomological databases and an assignment that involves the making and presentation of a small collection of insects.

**Assessment:** 1 x 2-hr theory exam (50%); practical test (week 6) (5%); report on zoo trip (5%); 2 practical reports (25%), insect collection (15%)

### **Textbooks**

Chapman, R.F. (1998) *The insects: structure and function*. 4<sup>th</sup> edition. Cambridge University Press: Cambridge, UK.  
Gullan, P.J., Cranston, P.S. (2004) *The insects: an outline of entomology*. 3<sup>rd</sup> edition. Blackwell Publishing: Oxford.  
McGavin, G.C (2001) *Essential entomology: an order-by-order introduction*. Oxford University Press: Oxford.

**UNIT COORDINATOR:** Dr Dieter Hochuli

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## BIOL2018/2918 INTRODUCTION TO MARINE BIOLOGY

### BIOL2018 INTRODUCTION TO MARINE BIOLOGY

Semester 2

**Prerequisites:** BIOL (1001 or 1911) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH).  
12 credit points of Junior Chemistry.

**Prohibition:** May not be counted with BIOL2918

### BIOL2918 INTRODUCTION TO MARINE BIOLOGY (ADVANCED)

**Prerequisites:** As for BIOL2018 plus Distinction average required in 12 credit points of Junior Biology. These requirements may be varied and students with lower averages should consult the unit coordinator.

**Description:** This unit has the same objectives as BIOL2018 Introduction to Marine Biology and is suitable for students wishing to pursue aspects from the unit in greater depth. Entry is restricted and selection is made from the applicants on the basis of their previous performance. Students taking this unit will participate in alternatives to some elements of the ordinary level course and will be required to pursue the unit objectives by more independent means. Specific details of the unit will be announced in meetings with the students taking the unit during the first week of teaching

**Prohibition:** May not be counted with BIOL2018, MARS (2006 or 2906 or 2007 or 2907)

**Lecturers:** A/Professor Ross Coleman Dr Ashley Ward Dr William Figueira

#### **Unit of Study Description**

This unit will describe some of the ways in which the properties of the oceans affect marine organisms. It also introduces coral reefs and other marine ecosystems, together with their productivity, biological oceanography, the reproductive biology of marine organisms, and marine biological resources. The practical elements will provide the core skills and techniques that will equip students to perform laboratory and field studies in marine biology. The unit will introduce appropriate methodologies for the collection, handling and analysis of data, the scientific principles underlying experimental design and the effective communication of scientific information.

**Timetable:** Practical classes will comprise 5 or 6 field days (5 hours each) and 4 laboratory practicals (3 hours each). Excursions may be timetabled for weekends if tides require.

**Assessment:** 1 x 2-hr theory exam (40%), 4 written reports (60%)

#### **Textbooks**

Levinton, J. (2009) *Marine Biology: Function, Biodiversity and Ecology (3rd edition)*. Oxford University Press..

#### **Recommended Reading**

Kingsford, M., Battershill, C. (1998) *Studying marine temperate environments: a handbook for ecologists*. Canterbury University Press: Christchurch.

Pechenik, J.A. (2010) *A Short Guide to Writing About Biology, 7<sup>th</sup> edition*. Longman, New York.

**UNIT COORDINATOR:** A/Professor Ross Coleman

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# ENVI2111/2911 CONSERVATION BIOLOGY & APPLIED ECOLOGY

## ENVI2111 CONSERVATION BIOLOGY & APPLIED ECOLOGY

Semester 1

**Prerequisites:** 12 credit points of Junior Biology (BIOL/MBLG/EDUH).

**Note:** The content of BIOL (1002 or 1902) is assumed knowledge and students entering without BIOL (1002 or 1902) will need to do some preparatory reading.

**Prohibition:** May not be counted with ENVI (2911 or 2001)

## ENVI2911 CONSERVATION BIOLOGY & APPLIED ECOLOGY (ADVANCED)

**Prerequisites:** As for ENVI 2111 plus Distinction average required in 12 credit points of Junior Biology. These requirements may be varied and students with lower averages should consult the unit coordinator.

**Description** This unit of study has the same objectives as ENVI 2111 Conservation Biology and Applied Ecology. Students taking this unit of study will participate in alternative components of ENVI 2111. The contents and nature of this unit of study may vary from year to year.

**Prohibition:** May not be counted with ENVI (2111 or 2001)

**Lecturers:** Dr Charlotte Taylor    A/Professor Clare McArthur    A/Professor Dieter Hochuli

**Unit of Study Objective:** The disciplines of conservation biology and applied ecology are two of the fastest growing areas of biology, driven by an imperative to have sound, knowledge-based approaches to managing environmental problems. We work with all manner of plants and animals in all manner of habitats, dealing with problems scaled from genes through to landscapes and ecosystems.

To be a part of these exciting disciplines you need to be aware of the complexity of generating solutions to environmental problems, many of which are driven by social and political constraints imposed upon our biological understanding.

### Unit of Study Description

This topic examines the role of conservation biology and applied ecology in environmental science, examining pattern and process in natural systems and evaluating how these are being affected by pervasive anthropogenic impacts. Focusing on the conservation, assessment of impacts and the restoration of natural systems, we consider the range of ecological issues environmental scientists must address. We examine the extent of environmental problems, derive explanation of why and how they are occurring and address management options for resolving them. We will derive general principles for these by addressing case studies, chosen from Australian examples when possible. The aim of this unit is for you to understand the processes that go into solving environmental problems from an ecological perspective and how to identify management options.

The field trip component is designed to give you experience of the tools used by ecologist to survey fauna and flora in a number of different habitats. An understanding of the tools used on the field trip is essential to developing a critical understanding of species impact statements.

We modify material yearly to incorporate the absolute latest in conservation biology into the unit. We do this because keeping abreast of breakthroughs and developments in science is expected of you in your professional life.

**Assessment:** 1 x 2-hr theory examination (50%); Warrah field report (25%);  
plus for    ENVI 2111: Group presentation (5%) Review paper (20%).  
              ENVI 2911: Oral presentation (5%); Independent Research Report (20%).

### Textbooks

Reading lists will be posted with appropriate lecture notes.

**UNIT COORDINATOR:** Dr Charlotte Taylor

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## PLNT2001/2901 PLANT BIOCHEMISTRY & MOLECULAR BIOLOGY

### PLNT2001 PLANT BIOCHEMISTRY & MOLECULAR BIOLOGY

Semester 1

**Prerequisites:** 12 credit points of Junior Biology and 12 credit points of Junior Chemistry.

**Prohibition:** May not be counted with PLNT2901

### PLNT2001 PLANT BIOCHEMISTRY & MOLECULAR BIOLOGY (ADVANCED)

**Prerequisites:** Distinction average in 12 credit points of Junior Biology and 12 credit points of Junior Chemistry.

**Description:** The purpose of this unit is to promote a deeper understanding of plant biochemistry and how a biochemical approach is important in tackling many major questions in plant science. When you have successfully completed this unit, you should have the knowledge and confidence to critically evaluate current research on the biochemistry and function of plants, fungi and alga, and be able to communicate effectively about this subject. Students in PLNT2901 will undertake an independent research project under the supervision of a member of the School of Biological Sciences or the Faculty of Agriculture, Food and Natural Resources instead of some practical sections of the PLNT2001 unit.

**Prohibition:** May not be counted with PLNT2001.

**Lecturers:** Dr Meredith Wilkes Professor Les Copeland

**Unit of Study Objectives:** When you have successfully completed this unit you should be able to:

- describe the biochemical principles relating to the structure and function of plants, and how these principles relate to the use of plants by humans as a source of food and fibre
- perform simple laboratory experiments on plants and communicate the findings in written reports
- communicate understanding of the fundamental biochemistry of plants and how this knowledge can be applied
- undertake more advanced learning of basic and applied plant science

#### **Unit of Study Description**

This unit of study is designed to develop an understanding of the molecular principles that underlie the structure and function of plants and how these principles relate to the use of plants by humans as a source of food and fibre.

This unit of study explores the fundamentals of plant biochemistry, from what plants are made of to how plants regulate their metabolic processes. The specialised nature of these metabolic processes, which enable plants to respond to different biotic and abiotic environmental influences, is featured, as is their relationship to food, feed and fibres. It recognizes the specialized nature of plant biochemistry and molecular biology and is a platform for students who wish to gain a sound knowledge of plant growth and development.

This unit covers the biochemistry of the main carbohydrate, lipid, protein and nucleic acid constituents of plants; metabolic pathways that regulate plant growth and development; the mobilization and deposition of storage reserves; storage and expression of genetic information; and plant responses to environmental influences. The role of molecular biology in the manipulation of plant growth and development will also be explored.

Students enrolled in this unit will gain research and enquiry skills through attendance at lectures and participation in laboratory classes and tutorials; information literacy and communication skills through the synthesis of information used to prepare practical reports; and social and professional understanding by participation in group work and assessments that seek to understand the role of agriculture in the broader community.

**Assessment:** 1 x 1-hr mid-semester exam (15%); 1 x 1.5-hr theory exam (45%); lab reports (PLNT2001 only) (40%); project report (PLNT2901 only) (40%)

#### **Textbook**

No set text is recommended. A Study Guide/Laboratory Manual for the unit will be available from the University Copy Centre during Week 1 of semester. Lecture notes and readings will be available through Blackboard.

**UNIT COORDINATOR:** Dr Meredith Wilkes (Faculty of Agriculture, Food and Natural Resources)

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**Rm:** Australian Technology Park (C81)

## PLNT2002/2902 AUSTRALIAN FLORA: ECOLOGY & CONSERVATION

### PLNT2002 AUSTRALIAN FLORA: ECOLOGY & CONSERVATION Semester 1

**Prerequisites:** 6 credit points from any Junior unit of study.

**Note:** The content of BIOL (1002 or 1902) is assumed knowledge and students entering without BIOL (1002 or 1902) will need to do some preparatory reading.

**Prohibition:** May not be counted with PLNT2902.

### PLNT2902 AUSTRALIAN FLORA: ECOLOGY & CONSERVATION (ADVANCED)

**Prerequisites:** Distinction average in 6 credit points from any Junior unit of study. This requirement may be varied and students with lower averages should consult the unit coordinator.

**Description:** This unit of study has the same objectives as PLNT2002. Qualified students taking this unit of study will participate in alternative components of PLNT2002 and will be required to pursue the unit of study objectives by more independent means. The content and nature of these components may vary from year to year, and students will be provided with more information at the beginning of the unit of study.

**Prohibition:** May not be counted with PLNT2002.

**Lecturers:** A/Professor Murray Henwood      A/Professor Glenda Wardle

#### **Unit of Study Description**

This unit provides a broad understanding of the evolution, classification and diversity of terrestrial plants, and the principles of plant ecology in an Australian context. The major types of Australian vegetation are discussed across a range of temporal and spatial scales, and their current distribution related to their environment and origins. Selected contemporary issues in plant conservation from Australian natural and managed systems are explored. There is a strong emphasis on practical skills such as phylogenetic inference, plant identification and the collection and analysis of ecological data. The practical component of the unit of study uses examples taken from the Australian flora (including plants of horticultural significance) and major crop plants. Important elements of this unit are half-day field trips to the Royal National Park and the construction of student herbaria. The practical sessions and interactions with staff encourage students to develop their own learning style and enhance a strong sense of self-reliance. Critical thinking, effective communication and other vocational and generic skills are emphasized. The content is well suited to students with interests in botany, plant science and ecology, and is often combined with units of study offered through the School of Biological Sciences and the Faculty of Agriculture, Food and Natural Resources. This unit of study also complements a wide range of units of study from: science (*e.g.* plant science, earth and environmental science, animal science, bioinformatics, molecular and cell biology, genetics and biotechnology); agriculture (*e.g.* horticulture, land and water science, and natural resources); and broader disciplines (*e.g.* education, arts, and environmental law).

**Assessment:** 1 x 2-hr theory exam (40%); laboratory reports (20%); 1 x 2-hr practical exam (20%); herbarium (PLNT2002 only) (20%); research project (PLNT2902 only) (20%).

#### **Textbooks**

TBA. A Laboratory Manual for the unit will be available for purchase from the University Copy Centre during the first week of semester.

**UNIT COORDINATOR:** A/Professor Murray Henwood

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## PLNT2003/2903 PLANT FORM AND FUNCTION

### PLNT2003 PLANT FORM AND FUNCTION

Semester 2

**Prerequisite:** 12 credit points of Junior Biology, or equivalent. e.g. BIOL (1001 or 1911) and BIOL (1002 or 1902 or 1003 or 1903).

**Note:** The content of BIOL (1002 or 1902) is assumed knowledge and students entering from BIOL (1003 or 1903) but will need to do some preparatory reading.

**Prohibition:** May not be counted with PLNT2903.

### PLNT2903 PLANT FORM AND FUNCTION (ADVANCED)

**Prerequisite:** As for PLNT 2003 plus Distinction average in 12 credit points of Junior Biology. These requirements may be varied and students with lower averages should consult the unit coordinator.

**Description:** The content will be based on PLNT2003 but qualified students will participate in alternative components at a more advanced level. The content and nature of these components may vary from year to year.

**Prohibition:** May not be counted with PLNT2003.

**Lecturers:** Professor Robyn Overall Dr Rosanne Quinnell A/Professor Jan Marc Dr Carina Moeller  
A/Professor Charles Warren Dr Tarryn Turnbull

#### Unit of Study Description

This unit of study investigates the structure of cells, tissues and organs of flowering plants and relates them to function. Topics include how photosynthesis, translocation, water transport and nutrition relate to the structures that carry out these processes. Most of the information on plant structure will be provided in self-instructional audio-visual sessions augmented by small group discussions. This is integrated with experiments carried out in the laboratory or on field excursions to investigate the physiological aspects of plant structures. There is a focus on recent advances in plant molecular biology where they have been critical in enhancing our understanding of the form and function of plants. The physiological and anatomical responses of plants to extreme environments such as drought and salinity will also be addressed. Attention will be paid to the anatomy and physiology of crop, horticultural and Australian native plants. This unit of study complements Plant Biochemistry and Molecular Biology, Australian Flora: Ecology and Conservation and Cell Biology and leads onto senior units of study in plant sciences, including Plant Growth and Development. It is essential for those seeking a career in plant molecular biology.

**Assessment:** 1 x 2-hr theory exam (40%); practical exam (20%); field report (17%);  
plus for PLNT2003: anatomy report (13%); anatomy quizzes (5%); physiology quizzes (5%).  
PLNT2903: research project, oral and written presentation (23%).

#### Textbooks:

Taiz, L., Zeiger, E. (2010) *Plant Physiology*. 5th edition. Sinauer: Sunderland, Massachusetts.

#### Recommended Reading

Atwell, B, Kriedemann, P., Turnbull, C. (1999) *Plants in Action*. Macmillan: South Yarra.

Buchanan, B.B., Gruissem, W., Jones, R.L. (2000) *Biochemistry and Molecular Biology of Plants*. ASPP: Rockville, Maryland.

Graham, L.E., Graham, J.M., Wilcox, L.W. (2006) *Plant Biology*. 2<sup>nd</sup> edition. Pearson Prentice Hall: New Jersey.

Raven, PH, Evert, RF, Eichorn (2005) *Biology of Plants*. 7<sup>th</sup> edition. WH Freeman & Co: New York.

Salisbury, F.B., Ross, C.W. (1992) *Plant Physiology*. 4th edition. Wadsworth: Belmont, California.

**UNIT COORDINATOR:** Dr Rosanne Quinnell

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## MBLG2071/2971 MOLECULAR BIOLOGY AND GENETICS A

### MBLG2071 MOLECULAR BIOLOGY & GENETICS A

Semester 1

**Prerequisite:** MBLG (1001 or 1901) and 12 credit points of Junior Chemistry.

For Combined BAppSc (Exercise and Sport Science)/BSc(Nutrition) degree the completion of all Junior units listed for this degree in the Faculty of Science Handbook.

**Prohibition:** May not be counted with MBLG2971, PLNT 2001.

### MBLG2971 MOLECULAR BIOLOGY & GENETICS A (ADVANCED)

**Prerequisite:** As for MBLG2071 plus Distinction average in MBLG1001 or MBLG1901.

**Description:** Extension of concepts presented in MBLG2071, which will be taught in the context of practical laboratory experiments.

**Prohibition:** May not be counted with MBLG2071, PLNT2001.

Intermediate Molecular Biology and Genetics units of study are taught by staff from the School of Molecular Bioscience (SMB) and the School of Biological Sciences (SoBS). The Semester 1 course, MBLG2071, is coordinated by SMB; the Semester 2 course, MBLG2072, is coordinated by SoBS.

#### **Unit of Study Description**

This unit of study extends the basic concepts introduced in MBLG1001/1901 and provides a firm foundation for students wishing to continue in the molecular biosciences as well as for those students who intend to apply molecular techniques to other biological or medical questions. The unit explores the regulation of the flow of genetic information in both eukaryotes and prokaryotes. The central focus is on the control of replication, transcription and translation and how these processes can be studied and manipulated in the laboratory. The processes of DNA mutation and repair are also discussed. Experiments in model organisms are presented to illustrate current advances in the field, together with discussion of work carried out in human systems and the relevance to human genetic diseases. The tools of molecular biology are taught within the context of recombinant DNA-cloning, with an emphasis on essential knowledge required to use plasmid vectors. The methods of gene introduction (examples of transgenic plants and animals) are also discussed. Other techniques include PCR methodology and its use for cloning specific genes and detection of polymorphisms, separating DNA fragments by gel electrophoresis and analysis of macromolecules by Southern, Northern & Western blotting. In the genomics section, topics include assigning genes to specific chromosomes, high-resolution chromosome mapping, DNA markers, physical mapping of genomes as well as DNA and genome sequencing methods and international projects in genome mapping.

The practical course complements the theory and builds on the skills learnt in MBLG1001. Specifically students will: use spectrophotometry for the identification and quantification of nucleic acids; explore the lac operon system for the investigation of gene expression control; and perform PCR analysis. As with MBLG1001, strong emphasis is placed on the acquisition of generic and technical skills.

**Assessment:** 1 x 2.5-hr theory examination (50%); theory of practical examination (25%); practical work and laboratory reports (25%)

#### **Textbook**

Watson, J.D., Baker, T.A., Bell, S.P., Gann, A., Levine, M., Losick, R. (2008) *Molecular Biology of the Gene*. 6<sup>th</sup> edition. Pearson: San Francisco

Resource manual for MBLG2071 Practical Sessions, Semester 1.

**UNIT COORDINATOR:** Ms Vanessa Gysbers (School of Molecular Bioscience)

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## MBLG2072/2972 MOLECULAR BIOLOGY AND GENETICS B

### MBLG2072 MOLECULAR BIOLOGY and GENETICS B

Semester 2

**Prerequisites:** BIOL (1001 or 1003 or 1911 or 1903) and MBLG (1001 or 1901) and 12 credit points of Junior Chemistry.

**Assumed Knowledge:** MBLG (2071 or 2971).

**Prohibition:** May not be counted with MBLG2972.

### MBLG2972 MOLECULAR BIOLOGY and GENETICS B (ADVANCED)

**Prerequisites:** As for MBLG2072 plus Distinction in MBLG (2071 or 2971)

**Assumed Knowledge:** As for MBLG2071.

**Description:** This unit of study offers high achieving students the opportunity to gain a deeper knowledge of some aspects of molecular biology and genetics. It has the same organisation and objectives as MBLG2072. Students undertaking this unit will substitute some advanced or extended material for certain aspects of the MBLG2072 curriculum. The content and nature of these components may vary from year to year. This is a core Intermediate unit of study in the BSc (Molecular Biology and Genetics) award course.

**Prohibitions:** May not be counted with MBLG2072.

Intermediate Molecular Biology and Genetics Units are taught by staff from the School of Molecular Bioscience (SMB) and the School of Biological Sciences (SoBS). The Semester 1 course, MBLG2071, is coordinated by SMB; the Semester 2 course, MBLG2072, is coordinated by SoBS.

**Unit of Study Objectives:** The purpose of this unit of study is for students to:

- acquire a theoretical understanding of modern genetics
- develop the practical and analytical skills necessary to apply this theoretical knowledge
- become competent in the use of standard laboratory equipment used by geneticists, including micropipettes, electrophoresis apparatus and computers
- understand the central place of molecular biology and genetics in modern biology
- appreciate the means by which molecular tools can be used to answer questions in other areas of biology
- develop confidence in their ability to participate in more advanced units of study in genetics

**Unit of Study Description:** This unit of study builds on the concepts introduced in MBLG2071 and shows how modern molecular biology is being applied to the study of the genetics of all life forms from humans and other complex multicellular organisms through to single-celled organisms such as bacteria. Students will be introduced to more complex modes of Mendelian inheritance, including those involved in human diseases. The molecular basis for different patterns of inheritance will be discussed. The interaction of genes and gene products will be illustrated by the examination of the molecular genetics of development. The application of genomics to the study of genetic variation and gene function in humans and model organisms, as well as to an understanding of molecular evolution, will be described.

**Practical:** In laboratory exercises you will investigate the genetics of a variety of prokaryotic and eukaryotic organisms to illustrate concepts covered in the lecture material. Students will develop familiarity and competence with equipment used in molecular genetic analysis, bioinformatics, microscopy and statistical tests. Generic skills are developed in report writing, oral presentation, problem solving and data analysis. Successful completion of this unit of study is required in order to progress to the Bachelor of Science major in Molecular Biology and Genetics.

**Assessment:** 1 x 2-hr theory examination (50%); quizzes and practical reports (50%)

**Textbook:** Griffiths, A.J.F., Wessler, S.R., Carroll, S.B. and Doebley, J. (2012) *Introduction to genetic analysis*. 10<sup>th</sup> edition. Freeman.

**UNIT COORDINATOR:** Dr Penny Smith

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## STUDENT-STAFF LIAISON COMMITTEE

The staff of the School of Biological Sciences are available at all times to discuss with students in the School any problems or difficulties that might arise concerning units of study in Biology.

In the first instance, difficulties and/or questions should be brought to the attention of the lecturer. If the problem is a more general one, affecting a number of students or the whole class, the best person to approach is the unit coordinator of the unit of study. The names of the unit coordinators for each Intermediate Biology unit of study are listed for each unit of study in this booklet.

The School has a Student/Staff Liaison Committee, which conducts two meetings each semester (a combined meeting for Junior and Intermediate students and a separate meeting for Senior students). Student Representatives are elected to the Committee from each unit of study in Biology. Each Student Representative is asked to bring before the Committee any matters of general concern to their fellow students, and to report on the current progress of the unit of study. The unit of study Coordinators are members of the Committee and the Chair of the School's Teaching Committee is Chair of the Committee.

Discussions at Committee meetings are informal, but are carried out in a way that allows suitable action to be taken to solve identified problems.

## ACADEMIC HONESTY

Academic honesty is a core value of the University of Sydney. The University is committed to the basic academic right that students receive due credit for work submitted for assessment. This requires that all work you submit for assessment represents your own research and your own writing. It is clearly unfair for students to submit work for assessment that dishonestly represents the work of others as their own. Such activity is called plagiarism and is a form of fraud.

All students must be familiar with the University's policy on academic honesty at:

[http://sydney.edu.au/ab/policies/Academic\\_Honesty\\_Cwk.pdf](http://sydney.edu.au/ab/policies/Academic_Honesty_Cwk.pdf)

All work submitted for assessment must be accompanied by a signed compliance statement certifying that you have read the University policy on plagiarism and that the submitted work is your own. This declaration will form part of the cover sheet information for all submitted work.

### *Plagiarism*

Plagiarism is broadly defined as presenting another person's ideas, findings or written work as one's own by copying or reproducing them without due acknowledgment of the source. Plagiarism includes: copying or paraphrasing the work of another student; using a published author's text or argument without giving a reference; and copying material verbatim from a text or website (whether or not you provide a reference). Plagiarism also includes co-writing an assignment with another student rather than as an individual.

There are extremely severe penalties for plagiarism, including expulsion from the University. All cases of plagiarism must be reported to the University Registrar and remain permanently on a student's record. A guide to avoid plagiarism is available at:

<http://elearning.library.usyd.edu.au/learn/plagiarism/index.php>

### RELEASE OF MARKS

**While the School might release raw marks of progressive assessment scores, the only official result is the final result. The final result can be modified at both Departmental and Faculty levels before being released officially by the Registrar.**

## SEMESTER 1 TIMETABLE PLANNER

Use this grid to help plan your timetable for Semester 1. The possible times for each Intermediate unit of study are given on page 4 of this booklet.

(Note that the University Timetabling Unit will assign you to specific lecture, practical and tutorial times where there are repeat classes during the week and you must attend those classes to which you are assigned.)

### SEMESTER 1 INTERMEDIATE BIOLOGY UNITS OF STUDY

- BIOL2011/2911: Invertebrate Zoology
- BIOL2016/2916: Cell Biology
- ENVI 2111/2911: Conservation Biology and Applied Ecology
- PLNT2001/2901: Plant Biochemistry and Molecular Biology
- PLNT2002/2902: Australian Flora: Ecology and Conservation
- MBLG2071/2971: Molecular Biology and Genetics A

	Mon	Tues	Wed	Thu	Fri
<b>8 - 9</b>					
<b>9 - 10</b>					
<b>10 - 11</b>					
<b>11 - 12</b>					
<b>12 - 1</b>					
<b>1 - 2</b>					
<b>2 - 3</b>					
<b>3 - 4</b>					
<b>4 - 5</b>					
<b>5 - 6</b>					

## SEMESTER 2 TIMETABLE PLANNER

Use this grid to help plan your timetable for Semester 2. The possible times for each Intermediate unit of study are given on page 4 of this booklet.

(Note that the University Timetabling Unit will assign you to specific lecture, practical and tutorial times where there are repeat classes during the week and you must attend those classes to which you are assigned.)

### SEMESTER 2 INTERMEDIATE BIOLOGY UNITS OF STUDY

BIOL2012/2912: Vertebrates and Their Origins

BIOL2017/2917: Entomology

BIOL2018/2918: Introduction to Marine Biology

PLNT2003/2903: Plant Form and Function

MBLG2072/2972: Molecular Biology and Genetics B

	<b>Mon</b>	<b>Tues</b>	<b>Wed</b>	<b>Thu</b>	<b>Fri</b>
<b>8 - 9</b>					
<b>9 - 10</b>					
<b>10 - 11</b>					
<b>11 - 12</b>					
<b>12 - 1</b>					
<b>1 - 2</b>					
<b>2 - 3</b>					
<b>3 - 4</b>					
<b>4 - 5</b>					
<b>5 - 6</b>					