



# BIOL260

## Science of Sex

S2 Day 2016

*Dept of Biological Sciences*

### Contents

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<a href="#"><u>General Information</u></a>	2
<a href="#"><u>Learning Outcomes</u></a>	3
<a href="#"><u>General Assessment Information</u></a>	3
<a href="#"><u>Assessment Tasks</u></a>	3
<a href="#"><u>Delivery and Resources</u></a>	6
<a href="#"><u>Unit Schedule</u></a>	8
<a href="#"><u>Policies and Procedures</u></a>	10
<a href="#"><u>Graduate Capabilities</u></a>	13
<a href="#"><u>Changes from Previous Offering</u></a>	18

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#### **Disclaimer**

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

## General Information

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Credit points

3

Prerequisites

12cp or admission to GCertBiotech

Corequisites

Co-badged status

BIOL607

Unit description

Topics related to sex pervade our culture, media, politics, relationships and everyday life.

Despite this, many of us have never had the opportunity to learn why sex evolved. What are the real differences between males and females? What is the chemistry that makes partners attractive? Why are the sexual strategies and behaviours of different species so diverse?

What hormones control our maturation, reproductive cycles and pregnancy? This unit takes a broad approach, using examples (some quite bizarre) from the animal and plant worlds. At the same time, we cover in depth the sexual biology and behaviour of our own intriguing species.

## Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

## Learning Outcomes

On successful completion of this unit, you will be able to:

- Understand and use correct biological terminology
- Explain the difference between asexual and sexual reproduction, and have an understanding of why sexual reproduction has evolved
- Identify the various animal (and plant) mating systems and the strategies used by males and females from each
- Recall specific examples of species from each of the mating systems presented during lectures
- Outline and understand evolutionary processes, especially in relation to sexual selection (rather than natural selection)
- Read and understand scientific papers in the sexual selection literature
- Work in pairs to create a poster that succinctly summarises information on a sexual selection topic

## General Assessment Information

### Unit completion requirements

Students must

- receive a final mark of  $\geq 50\%$
- make a serious attempt of seven or more of the ten weekly quizzes
- submit a serious attempt at the poster assessment
- attend and participate in the poster session/peer review (week 12 tute/OCS2)

## Assessment Tasks

Name	Weighting	Due
<a href="#"><u>Science skills quiz</u></a>	0%	End of week 4
<a href="#"><u>Textbook reading/questions</u></a>	20%	End of week 7 and 13
<a href="#"><u>Poster assessment</u></a>	25%	End of week 10
<a href="#"><u>Peer review</u></a>	5%	End of week 12
<a href="#"><u>Quizzes</u></a>	50%	End of week 13

## Science skills quiz

Due: **End of week 4**

Weighting: **0%**

Online quiz. 10 questions, 60 mins. The quiz will test your ability in various science skills eg. referencing, plagiarism, basic writing, library searches. You have 3 attempts, and your highest score will be recorded.

On successful completion you will be able to:

- Understand and use correct biological terminology

## Textbook reading/questions

Due: **End of week 7 and 13**

Weighting: **20%**

You will be required to read the relevant section/s of the textbook for each topic (10 in total), complete a series of questions and submit them online for marking. Each submission is worth 2%. Due dates are end of week 7 (topics 2-6) and end of week 13 (topics 7-11).

On successful completion you will be able to:

- Understand and use correct biological terminology
- Explain the difference between asexual and sexual reproduction, and have an understanding of why sexual reproduction has evolved
- Identify the various animal (and plant) mating systems and the strategies used by males and females from each
- Recall specific examples of species from each of the mating systems presented during lectures
- Outline and understand evolutionary processes, especially in relation to sexual selection (rather than natural selection)
- Read and understand scientific papers in the sexual selection literature

## Poster assessment

Due: **End of week 10**

Weighting: **25%**

Based on a real data set, the idea is to take on the role of the researcher and present the research findings as if they are your own. There are two study species to choose from, and the assessment is done in pairs.

On successful completion you will be able to:

- Understand and use correct biological terminology
- Explain the difference between asexual and sexual reproduction, and have an understanding of why sexual reproduction has evolved
- Identify the various animal (and plant) mating systems and the strategies used by males and females from each
- Recall specific examples of species from each of the mating systems presented during lectures
- Outline and understand evolutionary processes, especially in relation to sexual selection (rather than natural selection)
- Read and understand scientific papers in the sexual selection literature
- Work in pairs to create a poster that succinctly summarises information on a sexual selection topic

## Peer review

Due: **End of week 12**

Weighting: **5%**

You will be required to assess five other students' posters, and your ability to review will be graded. This is done at the poster session in week 12's tutorial, and attendance is mandatory.

On successful completion you will be able to:

- Understand and use correct biological terminology
- Explain the difference between asexual and sexual reproduction, and have an understanding of why sexual reproduction has evolved
- Identify the various animal (and plant) mating systems and the strategies used by males and females from each
- Recall specific examples of species from each of the mating systems presented during lectures
- Outline and understand evolutionary processes, especially in relation to sexual selection (rather than natural selection)
- Read and understand scientific papers in the sexual selection literature
- Work in pairs to create a poster that succinctly summarises information on a sexual selection topic

## Quizzes

Due: **End of week 13**

Weighting: **50%**

Weekly quizzes completed in iLearn. Will test your knowledge of the lecture content from week

2-11. Each quiz worth 5%.

On successful completion you will be able to:

- Understand and use correct biological terminology
- Explain the difference between asexual and sexual reproduction, and have an understanding of why sexual reproduction has evolved
- Identify the various animal (and plant) mating systems and the strategies used by males and females from each
- Recall specific examples of species from each of the mating systems presented during lectures
- Outline and understand evolutionary processes, especially in relation to sexual selection (rather than natural selection)

## Delivery and Resources

### CLASSES

#### Timetable

Lectures: Three lectures per week, all available online in iLearn

Lecture 1	Tuesday 12-1pm	X5B 100 (T1)
Lecture 2	Wednesday 3-4pm	X5B 100 (T1)
Lecture 3	Thursday 10-11am	X5B 100 (T1)

Tutorials: Two options: internal (1-hr fortnightly) or external (two oncampus sessions)

#### *Fortnightly tutes*

1. Thurs 9am-11am E4B314
2. Thurs 11am-12pm W5C232
3. Thurs 12-1pm W5C232
4. Thurs 2-3pm W5A101
5. Fri 11am-12pm E7B200
6. Fri 12-1pm E7B200
7. Fri 1-2pm E7B200
8. Fri 2-3pm E5A110
9. OCS 1 Saturday 10am – 1pm Sep 3<sup>rd</sup> E8A120/160; OCS 2 Saturday 10am – 1pm Nov 5<sup>th</sup> E8A120/160

## Required unit materials

### Textbook

Barry, K.L. & Holwell, G.I. 2012. *The science of sex (third edition)*. McGraw-Hill Publishers, Sydney.

This textbook was designed specifically for BIOL260, and you can purchase a hardcopy of the book (~\$80) from the University Coop Bookshop or an e-book (~\$55) direct from the publisher's website (<https://create.mheducation.com/shop/#/catalog/details/?isbn=9781121500389>). Much of the lecture material corresponds with chapters in the text, and the associated readings and questions are taken directly from this book. There are also many copies held in the reserve section of the library. The second and third editions are both suitable for this unit.

### Software

The poster file must be created in PowerPoint, Keynote or Open Office only, so please make sure you own or have access to one of these software programs. You are also expected to create graphs for your poster presentation, so you should own or have access to Excel or another similar program.

## UNIT WEBPAGE AND TECHNOLOGY USED AND REQUIRED

### Website

iLearn <http://ilearn.mq.edu.au> and student email will be the principle method of communication in this unit, and you should be checking each of them regularly (every 2 days at absolute minimum). If you have a personal email account that you check more often, please forward your student email to that account.

You are expected to use iLearn for:

- Regularly checking subject announcements;
- Discussing lectures and readings with lecturers/tutors and other students;
- Downloading lecture materials;
- Downloading reference materials;
- Completing/submitting assessment tasks (*the online quizzes require a stable/fast internet connection*);
- Receiving feedback for assessment tasks;
- Checking your grades.

### How do you log in?

Use your Macquarie OneID to login. If you are having problems logging in after ensuring you

have entered your username and password correctly, you should contact Student IT Help, Email: [help@mq.edu.au](mailto:help@mq.edu.au), Phone: (02) 9850 4357 (in Sydney) or 1 800 67 4357 (toll-free outside Sydney).

## Unit Schedule

Lecture	Week	Lecturer	Specific topic
1	1	Kate B	Unit outline
2	1	Kate B	Assessment
3	1	Kate B	Evolution
4	2	Mike G	Why have sex?
5	2	Mike G	Sex determination
6	2	Mike G	Gonad development
7	3	Mike G	Development of human genitalia
8	3	Mike G	Hormones, cycles, puberty, pregnancy
9	3	Mike G	Gametes, fertilisation, contraception
10	4	Mike G	Love, neurobiology and orgasm
11	4	Mike G	Sexually transmitted infections
12	4	Mike G	Human mate choice
13	5	Kate B	Animal reproduction
14	5	Kate B	Animal mating systems
15	5	Kate B	Sexual selection & sex roles
16	6	Kate B	Mate competition
17	6	Kate B	Mate choice
18	6	Malin A	Current views on sex roles
19	7	Kate B	Sexual signals I



20	7	Kate B	Sexual signals II
21	7	Kate B	Sexual signals III
22	8	Kate B	Multiple mating & Genitalia
23	8	Kate B	Sperm competition
24	8	Kate B	Cryptic choice
25	9	Kate B	Sexual conflict & SAC
26	9	Kate B	Sexual cannibalism
27	9		
28	10	Andy B	Sexual diversity I
29	10	Andy B	Sexual diversity II
30	10	Andy B	Sexual diversity III
31	11	Brian A	Plant reproduction I
32	11	Brian A	Plant reproduction II
33	11	Julia C	Sexual deception in orchards
34-37	12-13	Guests	

## TUTORIAL SCHEDULE

Week	Topic
2	Overview of assessment
4	Methods & Graphs

6	Stats & Data interpretation	
8	Poster examples	
10	Q&A session	
12	Poster session (compulsory)	

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](#). Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy [http://mq.edu.au/policy/docs/academic\\_honesty/policy.html](http://mq.edu.au/policy/docs/academic_honesty/policy.html)

**New Assessment Policy in effect from Session 2 2016** [http://mq.edu.au/policy/docs/assessment/policy\\_2016.html](http://mq.edu.au/policy/docs/assessment/policy_2016.html). For more information visit [http://students.mq.edu.au/events/2016/07/19/new\\_assessment\\_policy\\_in\\_place\\_from\\_session\\_2/](http://students.mq.edu.au/events/2016/07/19/new_assessment_policy_in_place_from_session_2/)

Assessment Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/assessment/policy.html>

Grading Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/grading/policy.html>

Grade Appeal Policy <http://mq.edu.au/policy/docs/gradeappeal/policy.html>

Complaint Management Procedure for Students and Members of the Public [http://www.mq.edu.au/policy/docs/complaint\\_management/procedure.html](http://www.mq.edu.au/policy/docs/complaint_management/procedure.html)

Disruption to Studies Policy [http://www.mq.edu.au/policy/docs/disruption\\_studies/policy.html](http://www.mq.edu.au/policy/docs/disruption_studies/policy.html) *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

In addition, a number of other policies can be found in the [Learning and Teaching Category](#) of Policy Central.

## Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: [https://students.mq.edu.au/support/student\\_conduct/](https://students.mq.edu.au/support/student_conduct/)

## Results

Results shown in *iLearn*, or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit [ask.mq.edu.au](#).

## Extensions and penalties

10% of the mark allocated for each assignment will be deducted per day that any work is submitted late. Only a medical certificate or a letter with appropriate supporting documents outlining other serious, extenuating circumstances can be used to submit an assignment after the due date without penalty. All applications for special consideration or extension must be sought *before the due date* unless this is absolutely impossible (in which case you have 3 days from the due date). All applications for extensions of deadlines must be submitted to the unit convenor.

## Plagiarism

Plagiarism involves using the work of another person and presenting it as one's own. Copying out part of any document, audio-visual material or computer-based material, is only acceptable if you use quotation marks, and you must still acknowledge the source of the information (you should always try and restate the information in your own words though, because you will be marked down for use of quotations).

Any of the following acts constitutes plagiarism unless the source of each quotation or piece of borrowed material is clearly acknowledged:

- using or extracting another person's concepts, experimental results, or conclusions
- summarising another person's work
- submitting substantially the same final version of any material as another student in an assignment where there was collaborative preparatory work
- submitting the same or substantially the same piece of work for two different tasks (self-plagiarism)

A full outline of the revised University Policy on plagiarism can be found on the official website at [http://www.mq.edu.au/policy/docs/academic\\_honesty/policy.html](http://www.mq.edu.au/policy/docs/academic_honesty/policy.html). The website includes a general discussion of plagiarism, definitions, examples drawn from concrete cases, procedures that will be followed by the University in cases of plagiarism, and recommended penalties. Students are expected to familiarise themselves with the website.

Depending on the level of plagiarism, penalties range from a loss of marks to awarding of a zero for the assessment. A note will be added to the student's university file, and particularly extreme

cases will be reported to a Faculty disciplinary committee.

Plagiarism involves using the work of another person and presenting it as one's own. Copying out part of any document, audio-visual material or computer-based material, is only acceptable if you use quotation marks, and you must still acknowledge the source of the information (you should always try and restate the information in your own words though, because you will be marked down for use of quotations).

Any of the following acts constitutes plagiarism unless the source of each quotation or piece of borrowed material is clearly acknowledged:

- using or extracting another person's concepts, experimental results, or conclusions
- summarising another person's work
- submitting substantially the same final version of any material as another student in an assignment where there was collaborative preparatory work
- submitting the same or substantially the same piece of work for two different tasks (self-plagiarism)

A full outline of the revised University Policy on plagiarism can be found on the official website at [http://www.mq.edu.au/policy/docs/academic\\_honesty/policy.html](http://www.mq.edu.au/policy/docs/academic_honesty/policy.html). The website includes a general discussion of plagiarism, definitions, examples drawn from concrete cases, procedures that will be followed by the University in cases of plagiarism, and recommended penalties. Students are expected to familiarise themselves with the website.

Depending on the level of plagiarism, penalties range from a loss of marks to awarding of a zero for the assessment. A note will be added to the student's university file, and particularly extreme cases will be reported to a Faculty disciplinary committee.

## Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

## Learning Skills

Learning Skills ([mq.edu.au/learningskills](http://mq.edu.au/learningskills)) provides academic writing resources and study strategies to improve your marks and take control of your study.

- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module for Students](#)
- [Ask a Learning Adviser](#)

## Student Services and Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

## Student Enquiries

For all student enquiries, visit Student Connect at [ask.mq.edu.au](http://ask.mq.edu.au)

## IT Help

For help with University computer systems and technology, visit [http://www.mq.edu.au/about\\_us/offices\\_and\\_units/information\\_technology/help/](http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/).

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.

## Graduate Capabilities

### Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

### Learning outcomes

- Recall specific examples of species from each of the mating systems presented during lectures
- Work in pairs to create a poster that succinctly summarises information on a sexual selection topic

### Assessment tasks

- Textbook reading/questions
- Poster assessment

### Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

### Learning outcome

- Read and understand scientific papers in the sexual selection literature

### Assessment tasks

- Textbook reading/questions

- Poster assessment
- Peer review

## Commitment to Continuous Learning

Our graduates will have enquiring minds and a literate curiosity which will lead them to pursue knowledge for its own sake. They will continue to pursue learning in their careers and as they participate in the world. They will be capable of reflecting on their experiences and relationships with others and the environment, learning from them, and growing - personally, professionally and socially.

This graduate capability is supported by:

### Learning outcomes

- Identify the various animal (and plant) mating systems and the strategies used by males and females from each
- Recall specific examples of species from each of the mating systems presented during lectures
- Outline and understand evolutionary processes, especially in relation to sexual selection (rather than natural selection)
- Read and understand scientific papers in the sexual selection literature
- Work in pairs to create a poster that succinctly summarises information on a sexual selection topic

### Assessment tasks

- Textbook reading/questions
- Poster assessment
- Peer review

## Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

### Learning outcomes

- Understand and use correct biological terminology
- Explain the difference between asexual and sexual reproduction, and have an

understanding of why sexual reproduction has evolved

- Identify the various animal (and plant) mating systems and the strategies used by males and females from each
- Recall specific examples of species from each of the mating systems presented during lectures
- Outline and understand evolutionary processes, especially in relation to sexual selection (rather than natural selection)
- Read and understand scientific papers in the sexual selection literature
- Work in pairs to create a poster that succinctly summarises information on a sexual selection topic

## Assessment tasks

- Science skills quiz
- Textbook reading/questions
- Poster assessment
- Peer review
- Quizzes

## Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

## Learning outcomes

- Explain the difference between asexual and sexual reproduction, and have an understanding of why sexual reproduction has evolved
- Identify the various animal (and plant) mating systems and the strategies used by males and females from each
- Recall specific examples of species from each of the mating systems presented during lectures
- Outline and understand evolutionary processes, especially in relation to sexual selection (rather than natural selection)
- Read and understand scientific papers in the sexual selection literature
- Work in pairs to create a poster that succinctly summarises information on a sexual selection topic

## Assessment tasks

- Textbook reading/questions
- Poster assessment
- Peer review
- Quizzes

## Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

## Learning outcomes

- Explain the difference between asexual and sexual reproduction, and have an understanding of why sexual reproduction has evolved
- Identify the various animal (and plant) mating systems and the strategies used by males and females from each
- Recall specific examples of species from each of the mating systems presented during lectures
- Read and understand scientific papers in the sexual selection literature
- Work in pairs to create a poster that succinctly summarises information on a sexual selection topic

## Assessment tasks

- Textbook reading/questions
- Poster assessment
- Peer review
- Quizzes

## Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:



## Learning outcomes

- Understand and use correct biological terminology
- Explain the difference between asexual and sexual reproduction, and have an understanding of why sexual reproduction has evolved
- Identify the various animal (and plant) mating systems and the strategies used by males and females from each
- Recall specific examples of species from each of the mating systems presented during lectures
- Outline and understand evolutionary processes, especially in relation to sexual selection (rather than natural selection)
- Read and understand scientific papers in the sexual selection literature
- Work in pairs to create a poster that succinctly summarises information on a sexual selection topic

## Assessment tasks

- Science skills quiz
- Textbook reading/questions
- Poster assessment

## Engaged and Ethical Local and Global citizens

As local citizens our graduates will be aware of indigenous perspectives and of the nation's historical context. They will be engaged with the challenges of contemporary society and with knowledge and ideas. We want our graduates to have respect for diversity, to be open-minded, sensitive to others and inclusive, and to be open to other cultures and perspectives: they should have a level of cultural literacy. Our graduates should be aware of disadvantage and social justice, and be willing to participate to help create a wiser and better society.

This graduate capability is supported by:

## Learning outcomes

- Identify the various animal (and plant) mating systems and the strategies used by males and females from each
- Recall specific examples of species from each of the mating systems presented during lectures
- Outline and understand evolutionary processes, especially in relation to sexual selection (rather than natural selection)
- Read and understand scientific papers in the sexual selection literature

## Assessment tasks

- Textbook reading/questions
- Poster assessment
- Peer review

## Socially and Environmentally Active and Responsible

We want our graduates to be aware of and have respect for self and others; to be able to work with others as a leader and a team player; to have a sense of connectedness with others and country; and to have a sense of mutual obligation. Our graduates should be informed and active participants in moving society towards sustainability.

This graduate capability is supported by:

## Learning outcomes

- Identify the various animal (and plant) mating systems and the strategies used by males and females from each
- Recall specific examples of species from each of the mating systems presented during lectures
- Read and understand scientific papers in the sexual selection literature

## Assessment tasks

- Textbook reading/questions
- Poster assessment
- Peer review

## Changes from Previous Offering

Tutorials are now held fortnightly and there are no longer marks for attendance.