



BIOL6110

Genetics

Session 1, Infrequent attendance, North Ryde 2020

Department of Biological Sciences

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General Information

Unit convenor and teaching staff

Unit Convenor

Rachael Dudaniec

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Unit Co-convenor

Jaco Le Roux

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Kate Barry

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Credit points

10

Prerequisites

Admission to MBiotech or MConsBiol or GradDipConsBiol or GradCertConsBiol or MSc

Corequisites

Co-badged status

Unit description

Genetics occupies a central role in modern sciences, with profound implications for basic and applied research in biology, medicine and agriculture, as well as for a number of philosophical issues in human affairs. This unit offers a balanced approach to teach introductory principles of genetics. It combines sections on classical, molecular and population genetics presented in an integrative way. The practical sessions offer students the possibility of learning essential techniques and skills in modern molecular genetics.

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:

ULO1: Describe how genetic processes apply to agriculture, human health, society, and the environment

ULO2: Apply numeracy and basic principles of genetics to solve problems and draw

conclusions from genetic data

ULO3: Describe routine techniques used to assay genetic variation in populations

ULO4: Demonstrate proficiency in the use of genetic research tools (pipettes, gel electrophoresis, sequence analysis)

ULO5: Analyse genetic data using some common population genetic software and bioinformatic tools

ULO6: Source, synthesise and critically evaluate information from the literature in written and oral formats

Assessment Tasks

Coronavirus (COVID-19) Update

Assessment details are no longer provided here as a result of changes due to the Coronavirus (COVID-19) pandemic.

Students should consult [iLearn](#) for revised unit information.

[Find out more about the Coronavirus \(COVID-19\) and potential impacts on staff and students](#)

General Assessment Information

To pass this unit students must attempt each assessment task and **achieve 45% or more in the final exam**. The final exam is comprised of multiple choice and short answer questions which will require problem solving and knowledge of genetic processes and techniques.

Delivery and Resources

Coronavirus (COVID-19) Update

Any references to on-campus delivery below may no longer be relevant due to COVID-19.

Please check here for updated delivery information: https://ask.mq.edu.au/account/pub/display/unit_status

REQUIRED AND RECOMMENDED TEXTS AND/OR MATERIALS

Unit Text Book

- Peirce (2017). **Genetics: A conceptual Approach (6th Edition)**. W.H. Freeman and Company, New York.

Other Major References

General Genetics

Griffiths, A. J. F., Wessler, S. R., Lewontin R. C., Gelbart W. M., Suzuki, D. T., Miller,

J.H. (2015). An Introduction to Genetic Analysis (11th Edition) W. H. Freeman, New York.

Population and Molecular Evolutionary Genetics

Avise, J. C. (2004). Molecular Markers, Natural History and Evolution. Sinauer, New York.

Frankham, R., Ballou, J. D. and Briscoe D. A. (2002) Introduction to Conservation Genetics. Cambridge University Press, Cambridge, UK.

Hartl, D. L. and Clark, A. G. (1997) Principles of Population Genetics (3rd Edition) Sinauer Assoc. Massachusetts.

Problem examples

Price H.J. (2000) Study Guide and Problems Workbook for Principles of Genetics (2nd Edition). John Wiley & Sons, NewYork.

Thompson, J. N., Hellack, J. J., Braver, G. and Durica, D. S. (1997). Primer of genetic analysis. A problems approach. Cambridge University Press, Cambridge.

UNIT WEBPAGE AND TECHNOLOGY USED AND REQUIRED TECHNOLOGY

BIOL 2110 on iLearn

Access Web Address: <https://ilearn.mq.edu.au/login/MQ/>

More information on this system can be found at the following site: http://www.mq.edu.au/iLearn/student_info/

iLearn provides **essential** information on various aspects of the unit, including practical guides, various notes, material required for practical reports, and general information about the unit.

Students should visit our web site on a weekly basis. Lecture notes and audio are available via Echo360.

If you are having trouble accessing your online unit due to a disability or health condition, please go to the Student Services Website at <http://sss.mq.edu.au/equity/about> for information on how to get assistance.

If you are having problems logging on, If you cannot log in after ensuring you have entered your username and password correctly, you should contact Student IT Help, Phone: (02) 9850 4357 (in Sydney) or 1 800 063 191 (outside Sydney).

Unit Schedule

Coronavirus (COVID-19) Update

The unit schedule/topics and any references to on-campus delivery below may no longer be relevant due to COVID-19. Please consult [iLearn](#) for latest details, and check here for updated delivery information: https://ask.mq.edu.au/account/pub/display/unit_status

Lecture Schedule 2020

Wednesday 2pm-3pm in Theatre 2 (T2) 14 Sir Christopher Ondaatje Ave; Thursday 1pm-2pm in Theatre 5 (T5) 14 Sir Christopher Ondaatje Ave

<u>Lecture</u>	<u>Date</u>	<u>Topic</u>
1	Feb 26	Unit Introduction and Basic Revision
2	Feb 27	Basic Revision 2: Sex and Reproduction
3	March 4	Mendelian Genetics
4	March 5	Sex Determination Patterns of Inheritance
5	March 11	Allelic variation and gene function
6	March 12	Linkage and Crossing Over
7	March 18	Chromosome Number and Structure
8	March 19	DNA Replication and Synthesis
9	March 25	Transcription and Translation
10	March 26	Gene Expression, Mutation and DNA Repair
11	April 1	Molecular Techniques I
12	April 2	Molecular Techniques II
13	April 8	Population Genetics
14	April 9	Inbreeding and Inbreeding Depression
Mid-Semester Break		
X	April 29	No lecture scheduled
15	April 30	Epigenetics
16	May 6	Evolutionary Genetics
17	May 7	Quantitative Genetics
18	May 13	Conservation Genetics
19	May 14	Reflecting on a successful career in genetics
20	May 20	Human Genetics
21	May 21	Technological Advances and Applications

22	May 27	Revision 1
23	May 28	Revision 2

Internal Practical Schedule

<u>Week</u>	<u>Date</u>	<u>Practical/Tutorial</u>
1	27 & 28 Feb	NO PRACTICAL/TUTORIAL
2	5 & 6 March	DNA Extraction and PCR
3	12 & 13 March	DNA Sequence Alignment and Data Analysis
4	19 & 20 March	Hardy-Weinberg Equilibrium – single locus
5	26 & 27 March	Hardy-Weinberg Equilibrium – population level
6	2 & 3 April	Data Quality in Genomics
7	9 & 10 April	NO PRACTICAL/TUTORIAL

Mid-Semester Break

8	30 April & 1 May	Poster Session I
9	7 & 8 May	Poster Session II
10	14 & 15 May	Revision questions
11	21 & 22 May	Test
12	28 & 29 May	Test Revision
13	4 & 5 June	NO PRACTICAL/TUTORIAL

External Practical Schedule

First On-Campus Session

Saturday March 14, 9.00 am (E8A150)

DNA Prac I - Extraction Review problem sets 1 - 2

DNA Prac II - PCR, Electrophoresis Finish ~ 6:00pm

Sunday March 15, 9.00 am (E8A 150)

HWE pracs 1 and 2

DNA Prac III - Sequence alignment and data analysis,

Practical report guidance

Finish ~ 6.00 pm

Second On-Campus Session

Monday April 20, 9.00am (E8A 150)

Data Quality in Genomics and HWE

Review problem set 3, 4 & 5 Finish ~6:00pm

Third On-Campus Session

Saturday May 23, 9.00 am (E8A 150)

All student posters

Sunday May 24, 9.00 am (E8A 150)

Revision Questions

Test

Finish ~ 2:00 pm

External Assessment Schedule (2020)

<u>Date</u>	<u>Assessment</u>
Saturday 14 March	Problem Sets 1 & 2 Due
Friday 17 April	Practical Report Due
Saturday 20 April	Problem Sets 3 - 5 Due
Thursday 21 May	Poster power point file due
Saturday 23 May	Poster presentation (on campus session)
Sunday May 24	Test

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Grade Appeal Policy](#)

- [Complaint Management Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#) (**Note:** *The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.*)

Students seeking more policy resources can visit the [Student Policy Gateway](https://students.mq.edu.au/support/study/student-policy-gateway) (<https://students.mq.edu.au/support/study/student-policy-gateway>). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit [Policy Central](http://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central) (<http://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/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/study/getting-started/student-conduct>

Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) 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 or if you are a Global MBA student contact globalmba.support@mq.edu.au

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) provides academic writing resources and study strategies to help you improve your marks and take control of your study.

- [Getting help with your assignment](#)
- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module](#)

The Library provides online and face to face support to help you find and use relevant information resources.

- [Subject and Research Guides](#)
- [Ask a Librarian](#)

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

If you are a Global MBA student contact globalmba.support@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/.

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.

Changes from Previous Offering

In response to the recent teaching evaluation and development surveys for this unit we have increased feedback for the test by dedicating the practical session following the test to working through the solutions. Additional feedback will also now be provided for the practical report. The word count for the practical report has also been reduced as has the length of the exam.

Changes since First Published

Date	Description
18/02/2020	xxx