



MOLS8002

Bioethics, Genes and Biotechnology

Session 2, Weekday attendance, North Ryde 2021

Archive (Pre-2022) - Department of Molecular Sciences

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Disclaimer

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Session 2 Learning and Teaching Update

The decision has been made to conduct study online for the remainder of Session 2 for all units WITHOUT mandatory on-campus learning activities. Exams for Session 2 will also be online where possible to do so.

This is due to the extension of the lockdown orders and to provide certainty around arrangements for the remainder of Session 2. We hope to return to campus beyond Session 2 as soon as it is safe and appropriate to do so.

Some classes/teaching activities cannot be moved online and must be taught on campus. You should already know if you are in one of these classes/teaching activities and your unit convenor will provide you with more information via iLearn. If you want to confirm, see the list of [units with mandatory on-campus classes/teaching activities](#).

Visit the [MQ COVID-19 information page](#) for more detail.

General Information

Unit convenor and teaching staff

Convenor, Lecturer, Tutor

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By appointment

Tutor, Lecturer

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Credit points

10

Prerequisites

Admission to GradDipBiotech or GradCertLabAQMgt or GradDipLabAQMgt or MBiotech or MBioBus or MLabAQMgt or MRadiopharmSc or MSc or MScInnovationChemBiomolecularSc or MPH or HSYP801 or HSYP8100 or HSYP802 or HSYP8101

Corequisites

Co-badged status

Unit description

This unit introduces students to ethical issues raised by current developments in biotechnology, especially in the sphere of genetic technology. Topics include the ethics of genetic technology in human medicine and reproduction, including genetic screening/testing; genetic therapies (somatic and germ-cell); genetic enhancement; and cloning; and the impact of biotechnology on other aspects of human, animal and environmental well-being. Students develop a firm grounding in the ethical principles, theories and frameworks with which to analyse a variety of biotechnological applications, in addition to the requirements of scientific and academic conduct and the carrying out of responsible research.

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: Explain the major ethical issues posed by specific biotechnological advances.

ULO2: Explain the central ethical concepts, principles and theories that arise in debates concerning the applications of biotechnological developments.

ULO3: Analyse and critically evaluate relevant case studies and scientific contexts, as well as theories and arguments in the relevant literatures.

ULO4: Apply the skills and concepts involved in ethical reasoning and argumentation to past, current and future controversies in biotechnological and other sciences.

ULO5: Construct clear and rigorous arguments in support of your own ethical positions and values.

ULO6: Apply enhanced skills in clarity of thought, clarity of oral and written expression, and written argumentation.

General Assessment Information

NB: Covid-restrictions may restrict access to campus and require tutorials/STGAs and examinations to be held online. You will be advised of the available teaching and examination modes at the start of semester.

Extensions: Extensions must be sought via the MQ Special Consideration application procedure, in advance of the due date. Extensions will only be granted for medical or equivalent reasons, supported by documentation (medical certificate or equivalent). Please note that workload in other units, and employment outside of university, will not be accepted as grounds for an extension.

LATE SUBMISSION POLICY:

Unless a Special Consideration request has been submitted and approved,

(a) a penalty for lateness will apply – 10 marks out of 100 credit will be deducted per day for assignments

submitted after the due date – and

(b) no assignment will be accepted more than seven days (incl. weekends after the original submission date).

Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Online Intro and film reflection</u>	5%	No	23:59pm Fri 6 August

Name	Weighting	Hurdle	Due
<u>10 weekly quizzes</u>	20%	No	23:59pm Sunday, weekly
<u>Essay</u>	25%	No	EITHER: 23:59pm Fri 17 Sept OR 23:59pm Fri 5 Nov
<u>Essay Self-assessment</u>	10%	No	EITHER: 23:59pm Fri 17 Sept OR 23:59pm Fri 5 Nov
<u>On-campus Examination</u>	25%	No	During examination period (online if required)
<u>Active Participation and Engagement</u>	15%	No	Ongoing (on campus or zoom as needed)

Online Intro and film reflection

Assessment Type ¹: Participatory task

Indicative Time on Task ²: 2.0 hours

Due: **23:59pm Fri 6 August**

Weighting: **5%**

Students introduce themselves online and post a brief reflection on the film shown in Lecture 1.

On successful completion you will be able to:

- Explain the major ethical issues posed by specific biotechnological advances.
- Explain the central ethical concepts, principles and theories that arise in debates concerning the applications of biotechnological developments.
- Analyse and critically evaluate relevant case studies and scientific contexts, as well as theories and arguments in the relevant literatures.
- Apply the skills and concepts involved in ethical reasoning and argumentation to past, current and future controversies in biotechnological and other sciences.
- Apply enhanced skills in clarity of thought, clarity of oral and written expression, and written argumentation.

10 weekly quizzes

Assessment Type ¹: Quiz/Test

Indicative Time on Task ²: 20 hours

Due: **23:59pm Sunday, weekly**

Weighting: **20%**

Students complete 10 short online quizzes, worth 2% each. Quizzes must be completed by the start of the following teaching week.

On successful completion you will be able to:

- Explain the major ethical issues posed by specific biotechnological advances.
- Explain the central ethical concepts, principles and theories that arise in debates concerning the applications of biotechnological developments.
- Analyse and critically evaluate relevant case studies and scientific contexts, as well as theories and arguments in the relevant literatures.
- Apply enhanced skills in clarity of thought, clarity of oral and written expression, and written argumentation.

Essay

Assessment Type ¹: Essay

Indicative Time on Task ²: 25 hours

Due: **EITHER: 23:59pm Fri 17 Sept OR 23:59pm Fri 5 Nov**

Weighting: **25%**

Students produce a piece of argumentative writing in response to assigned essay questions.

On successful completion you will be able to:

- Explain the major ethical issues posed by specific biotechnological advances.
- Explain the central ethical concepts, principles and theories that arise in debates concerning the applications of biotechnological developments.
- Analyse and critically evaluate relevant case studies and scientific contexts, as well as theories and arguments in the relevant literatures.
- Apply the skills and concepts involved in ethical reasoning and argumentation to past, current and future controversies in biotechnological and other sciences.
- Construct clear and rigorous arguments in support of your own ethical positions and values.
- Apply enhanced skills in clarity of thought, clarity of oral and written expression, and written argumentation.

Essay Self-assessment

Assessment Type ¹: Reflective Writing

Indicative Time on Task ²: 5.0 hours

Due: **EITHER: 23:59pm Fri 17 Sept OR 23:59pm Fri 5 Nov**

Weighting: **10%**

Students complete a self-assessment of their essay, using the essay rubric and criteria and qualitative assessment of the essay strengths, weaknesses and challenges.

On successful completion you will be able to:

- Apply the skills and concepts involved in ethical reasoning and argumentation to past, current and future controversies in biotechnological and other sciences.
- Apply enhanced skills in clarity of thought, clarity of oral and written expression, and written argumentation.

On-campus Examination

Assessment Type ¹: Examination

Indicative Time on Task ²: 23 hours

Due: **During examination period (online if required)**

Weighting: **25%**

Students complete an on-campus examination (1.5 hours) during University Examination period.

On successful completion you will be able to:

- Explain the major ethical issues posed by specific biotechnological advances.
- Explain the central ethical concepts, principles and theories that arise in debates concerning the applications of biotechnological developments.
- Apply the skills and concepts involved in ethical reasoning and argumentation to past, current and future controversies in biotechnological and other sciences.
- Construct clear and rigorous arguments in support of your own ethical positions and values.
- Apply enhanced skills in clarity of thought, clarity of oral and written expression, and written argumentation.

Active Participation and Engagement

Assessment Type ¹: Participatory task

Indicative Time on Task ²: 15 hours

Due: **Ongoing (on campus or zoom as needed)**

Weighting: **15%**

Students participate actively in 80% of tutorials, demonstrating that they have read the required readings and making active and constructive contributions to discussions.

On successful completion you will be able to:

- Explain the major ethical issues posed by specific biotechnological advances.
- Explain the central ethical concepts, principles and theories that arise in debates concerning the applications of biotechnological developments.
- Analyse and critically evaluate relevant case studies and scientific contexts, as well as theories and arguments in the relevant literatures.
- Apply the skills and concepts involved in ethical reasoning and argumentation to past, current and future controversies in biotechnological and other sciences.
- Construct clear and rigorous arguments in support of your own ethical positions and values.
- Apply enhanced skills in clarity of thought, clarity of oral and written expression, and written argumentation.

¹ If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the [Writing Centre](#) for academic skills support.

² Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

Delivery and Resources

NOTE: It is expected that students will listen to **ALL LECTURES** and will complete **ALL ASSESSMENT COMPONENTS** in this unit. You do not need to have passed each assessment to pass the unit, but it is expected that all assessments are attempted.

General Submission Procedure: Essays and presentations (if applicable) must be submitted

via TurnItIn at the correct link provided on the Unit iLearn site. Please note that there will be separate links for MOLS8002 and PHIL2060 students. Please ensure that you use the correct link for your assessment!

DELIVERY:

Lectures in this unit will be recorded and available online via Echo360 and the unit iLearn site.

Tutorials/STGAs will be either on campus or on zoom (or both) depending upon Covid restrictions.

READING: All required readings are available in Leganto on the unit iLearn site. Supplementary reading is required for Essays. Suggestions for Supplementary Reading will be provided in lectures and on iLearn.

Unit Schedule

SECTION I: (WEEKS 1–5) FRAMEWORKS FOR AN ETHICS OF BIOTECHNOLOGY

WEEK 1 (beginning July 26): What is ethics? What is ethical reasoning?

Required reading:

Cohen, S.: 'What is Ethics?

NOTE: NO TUTORIALS/STGAs in Week 1.

WEEK 2 (beginning Aug 2): How can ethical theories help us think about bioethics and biotechnology?

Part I: Consequentialist and Autonomy-based ethics.

Required reading:

Thomson, A.: 'Moral Principles and Moral Theories'.

Grace, D. and Cohen, S.: Chapter 1 pp.15-20, sections on 'Consequentialism' and 'Nonconsequentialism' in *Business Ethics: Problems and Cases*.

NOTE: Online Discussion Exercise due: by 23:59pm Fri 6 August.

WEEK 3 (beginning Aug 9): How can ethical theories help us think about bioethics and biotechnology?

Part II: Rights-based, Virtue-based, and Care-based ethics.

Required reading:

Rachels, J. Chapter 11, 'Feminism and the Ethics of Care', pp. 133-142.

Grace, D and Cohen, S.: Chapter 1 pp.21-24, section on 'Virtue Ethics' in *Business Ethics*:

Problems and Cases.

WEEK 4 (beginning Aug 16): How do we do ethical science and research?

Required reading:

Emanuel, E *et al.* 'What Makes Clinical Research Ethical?' *Journal of the American Medical Association (AMA)*, Vol. 283, No. 2 May24/31: 2701-2711.

Glass, B. 'The Ethical Basis of Science.'

WEEK 5 (beginning Aug 23): Does biotech have lessons to learn from eugenic history?

Required reading:

Wikler, D. and Barondess, J. 'Bioethics and Anti-Bioethics in Light of Nazi Medicine: What Must We Remember?'

Buchanan, A. *et al.*: Excerpt from 'Eugenics and Its Shadow'

Optional additional reading:

Buchanan, A. *et al.*: Excerpt from 'Genes, Justice and Human Nature.'

SECTION II (WEEKS 6–10): BIOTECHNOLOGY IN HUMAN HEALTH AND REPRODUCTION

WEEK 6 (beginning Aug 30): Genetic screening, testing and diagnosis – Is it always better to know?

Required reading:

Clarke, A. 'Genetic Screening and Counselling.'

Steinbock, B. 'Preimplantation Genetic Diagnosis and Embryo Selection.'

WEEK 7 (beginning Sept 6): Human embryo research – Do human embryonic stem cells have moral status? What about synthetic embryos [SHEEFs]?

Required reading:

Harris, J. 'Stem Cells, Sex and Procreation'

Pera, M. *et al.* 'What if stem cells turn into embryos in a dish?'

Optional additional reading:

Aach J. *et al.* 'Addressing the ethical issues raised by synthetic human entities with embryo like features'. *eLife* 2017;6: e20674. DOI: 10.7554/eLife.20674

MONDAY 13 SEPT – FRIDAY 24 SEPT (inclusive): MID SEMESTER BREAK

*** ESSAY OPTION 1 DEADLINE: 23:59pm Friday 17 September**

WEEK 8 (beginning Sept 27): Would anything be wrong with human cloning for procreative purposes?

Required reading:

Brock, D. 'Cloning Human Beings: An Assessment of the Ethical Issues Pro and Con.'

Optional additional reading:

Holm, S. 'A Life in the Shadow: One Reason Why We Should Not Clone Human Beings.'

Kass, L. 'The Wisdom of Repugnance.'

WEEK 9 (beginning Oct 4): Should we edit the human genome for future generations?

Required reading:

Chadwick, R. 'Gene Therapy.'

Smolensky, S. 'CRISPR/Cas9 and Germline Modification: New Difficulties in Obtaining Informed Consent'

Optional additional reading:

Elias, S. and Annas, G.: 'Somatic and Germline Gene Therapy.'

Warren, MA. 'The Moral Status of the Gene.'

WEEK 10 (beginning Oct 11): If genetic therapy is ok, what about genetic enhancement?

Required reading:

Singer, P. 'Parental Choice and Human Improvement'.

Ter Meulen, R *et al*: 'Ethical Issues of Enhancement Technologies'.

Optional additional reading:

Resnik, D and Vorhaus, D. 'Genetic Modification and Genetic Determinism'.

SECTION III (WEEKS 11-12): BIOTECHNOLOGY IN WIDER CONTEXT – COMMERCE AND FOOD

WEEK 11 (beginning Oct 18): Should human genes be privately ownable and

commercially exploitable?

Required reading:

Chadwick, R. and Hedgecoe, A. 'Commercial Exploitation of the Human Genome'

Optional additional reading:

Munzer, S. 'Property, Patents and Genetic Material'

WEEK 12 (Oct 25): Can food biotechnology be the 'fix' for environmental and food scarcity problems?

Required reading:

Scott, D. 'The Technological Fix Criticisms and the Agricultural Biotechnology Debate'

Thompson, P. 'Ethical Issues in Food Biotechnology'

*** ESSAY OPTION 2 DEADLINE: 23:59pm Friday 5 November**

SEMESTER ENDS – EXAMINATIONS BEGIN

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](https://policies.mq.edu.au) (<https://policies.mq.edu.au>). 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](#)

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

To find other policies relating to Teaching and Learning, visit [Policy Central](https://policies.mq.edu.au) (<https://policies.mq.edu.au>) and use the [search tool](#).

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/admin/other-resources/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

Changes to topics and readings. Removal of timed online test, replaced by 10 online quizzes.