



MOLS8002

Bioethics and Biotechnology

Session 2, In person-scheduled-weekday, North Ryde 2024

School of Natural Sciences

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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

Unit convenor and teaching staff

Mianna Lotz

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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

PHIL2060 and PHIX2060

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; human embryo research; 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

Requirements to Pass this Unit

To pass this unit you must:

Achieve a total mark equal to or greater than 50%. You do not need to pass every assessment to pass the unit overall.

Detailed assessment information and rubrics

Detailed information about each of the assessments, including rubrics and submission instructions will be available in the Assessment block in iLearn. Please make sure you read the assessment information carefully. Assessment forums for each assessment will be available on the unit iLearn – if you have an assessment question please check the assessment information and the relevant assessment forum to see if your question has already been answered. If not, please post your question on the assessment forum where it will be answered within 1-2 days (weekdays). Please do not email your tutor unless you have tried all the above sources and cannot find an answer to your question.

Special Consideration

Requests for extensions must be submitted via a Special Consideration request, which is available in the <http://ask.mq.edu.au> portal. Your request should be submitted **no later than five days after the due date** and will need to be accompanied by appropriate supporting documentation. Please see the Special Consideration policy in the list of policies at the end of this document for further details. Read the policy closely as your request may be turned down if you have not followed procedure, or if you have not submitted a request in a timely manner.

Late Assessment Submission Penalty

Unless a Special Consideration request has been submitted and approved, a 5% penalty (of the total possible mark of the task) will be applied for each day a written report or presentation assessment is not submitted, up until the 7th day (including weekends). After the 7th day, a grade of '0' will be awarded even if the assessment is submitted. The submission time for all uploaded assessments is 11:55 pm. A 1-hour grace period will be provided to students who experience a technical concern. For any late submission of time-sensitive tasks, such as scheduled tests/exams, performance assessments/presentations, and/or scheduled practical assessments/labs, please apply for Special Consideration.

Late assessments are not accepted in this unit unless a Special Consideration has been submitted and approved.

Academic Integrity

Academic honesty is taken very seriously, and a range of methods, including but not restricted to the use of Turnitin, are used to detect plagiarism. Misrepresenting someone else's work as your own may be grounds for referral to the Faculty Disciplinary Committee. If you have questions about how to properly cite work or how to credit sources, please ask the convenor for help and see also the Academic Integrity Policy <https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policies/academic-integrity>

Note: All assignments in this unit are individual assignments. Collusion (unauthorised collaboration on individual assignments) is a breach of the Academic Integrity Policy. If in doubt, contact a member of teaching staff.

A helpful resource if you would like to know more about referencing and avoiding plagiarism is Macquarie's Academic Integrity Module, available here: <https://students.mq.edu.au/support/study/skills-development>. You will need to complete this Module before accessing the unit content, if you have not already done so. More information is available in iLearn.

What about ChatGPT?

In this unit, submitted content generated by AI will be regarded as not being a student's own work. Students who submit AI-generated outputs for their assessments will be regarded as being in breach of Academic Integrity. This applies to all assessments. In submitting their written assessments all students confirm their agreement with the following:

This assessment is not an AI-generated output. It is based on my own research and my own thinking. I understand that if I am suspected of submitting AI-generated work, I may be found to be in breach of the MQ Academic Integrity Policy and may be required to attend a live interview with the Unit Convenor/lecturers/Integrity Officer to verify my own deep understanding of the content of my assessment, my research methods, and all sources I have quoted.

Academic Writing and Study Support

Macquarie University offers a number of services to help with academic writing, referencing and study skills. For details, see: <https://students.mq.edu.au/support/study/skills/assignments>

For information about policies related to Assessment, see *Policies and Procedures* section below.

COVID Information

For the latest information on the University's response to COVID-19, please refer to the Coronavirus infection page on the Macquarie website: <https://www.mq.edu.au/about/coronavirus-faqs>. Remember to check this page regularly in case the information and requirements change during semester. If there are any changes to this unit in relation to COVID, these will be communicated via iLearn.

Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Discussion Participation and Engagement</u>	20%	No	Weekly
<u>Essay</u>	35%	No	11.55pm Sunday September 22
<u>Essay Self-assessment</u>	10%	No	11.55pm Sunday September 22
<u>In-person timed examination</u>	35%	No	University Examinations Period

Discussion Participation and Engagement

Assessment Type ¹: Practice-based task

Indicative Time on Task ²: 15 hours

Due: **Weekly**

Weighting: **20%**

Students engage in planned discussion exercises in SGTAs, 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.

Essay

Assessment Type ¹: Essay

Indicative Time on Task ²: 35 hours

Due: **11.55pm Sunday September 22**

Weighting: **35%**

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.
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Essay Self-assessment

Assessment Type ¹: Reflective Writing

Indicative Time on Task ²: 5 hours

Due: **11.55pm Sunday September 22**

Weighting: **10%**

Students complete a self-evaluation of their own essay, using the essay rubric and criteria and writing a qualitative assessment of the essay strengths and weaknesses and of the challenges they encountered and addressed in the writing.

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.

In-person timed examination

Assessment Type ¹: Examination

Indicative Time on Task ²: 35 hours

Due: **University Examinations Period**

Weighting: **35%**

Students complete an in-person timed exam (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.

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: While not compulsory, it is an expectation that students will attend all scheduled lectures and SGTAs and complete all assessment components in this unit. You do not need to have passed each individual assessment to pass the unit, but it is expected that all assessments are attempted. Due to the way in which learning is scaffolded in this unit, missing lectures and SGTAs will put a student at risk of failure.

General Submission Procedure: Written assessments must be submitted via TurnItIn at the correct link provided on the Unit iLearn site. You will **not** be able to view your TurnItIn match similarity report for your assessment before you submit it. You must ensure that you use the correct link for your assessment, and that you upload the correct final version of your assessment.

DELIVERY

Lectures in this unit will be in-person (on-campus) with recordings available online via Echo360 and the unit iLearn site. STGAs will be on-campus.

Week 1 classes

There will be a full two-hour lecture in Week 1 and all students are expected to attend. There will be no SGTA's in Week 1. SGTAs commence in Week 2.

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 (week beginning July 22): What is ethics? What is ethical reasoning? (A/Prof Lotz)

Required reading:

Cohen, S.: 'What is Ethics?'

- **No SGTAs in Week 1**

WEEK 2 (beginning July 29): How can ethical theories help us think about bioethics and biotechnology? (A/Prof Lotz)

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*.

WEEK 3 (beginning Aug 5): How can ethical theories help us think about bioethics and biotechnology? (A/Prof Lotz)

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 12): Does biotech have lessons to learn from eugenic history? (A/Prof Lotz)

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.'

WEEK 5 (beginning Aug 19): How do we do ethical science and research? (Prof Lipworth)

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.'

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

WEEK 6 (beginning Aug 26): Human embryo research – Do human embryonic stem cells have moral status? What about synthetic embryos [SHEEFs]? (A/Prof Lotz)

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

WEEK 7 (beginning Sept 2): Would anything be wrong with human cloning for procreative purposes? (A/Prof Lotz)

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 8 (beginning Sept 9): Genetic screening, testing and diagnosis – Is it always better to know? (Prof Lipworth)

NB: This lecture is RECORDED and will not be given in-person on campus. Please access the lecture via Echo360 in the unit iLearn site, where it will be available by the usual lecture time. **SGTAs operate this week as normal.** It is especially important to attend your SGTA this week so that you can ask any questions/obtain any clarifications as is normally possible in the in-person lecture.

Required reading:

Clarke, A. 'Genetic Screening and Counselling.'

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

MONDAY 16 SEPT – FRIDAY 27 SEPT (inclusive): MID SEMESTER BREAK

**** ESSAY DUE DATE: 11.55pm Sunday September 22**

WEEK 9 (beginning Sept 30): Should we edit the human genome for future generations? (Prof Lipworth)

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 7): If genetic therapy is ok, what about genetic enhancement?(Prof Lipworth)

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 14): Should human genes be privately ownable and commercially exploitable? (Prof Lipworth)

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 (beginning Oct 21): Synthetic and food biotechnology: Solving environmental and food scarcity problems? (Prof Lipworth)

Required reading:

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

Rogers, W. 'Ethical Issues in Synthetic Biology: A Commentary'

Optional additional reading:

Thompson, P. 'Ethical Issues in Food Biotechnology'

- **No SGTAs this week**

WEEK 13: (beginning Oct 28): Exam Preparation Week

- **No SGTAs this week**

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](#)
- [Assessment Procedure](#)
- [Complaints Resolution 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

Academic Integrity

At Macquarie, we believe [academic integrity](#) – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free [online writing and maths support](#), [academic skills development](#) and [wellbeing consultations](#).

Student Support

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

The Writing Centre

[The Writing Centre](#) provides resources to develop your English language proficiency, academic writing, and communication skills.

- [Workshops](#)
- [Chat with a WriteWISE peer writing leader](#)
- [Access StudyWISE](#)
- [Upload an assignment to Studiosity](#)
- [Complete the 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

Macquarie University offers a range of [Student Support Services](#) including:

- [IT Support](#)
- [Accessibility and disability support](#) with study
- Mental health [support](#)
- [Safety support](#) to respond to bullying, harassment, sexual harassment and sexual assault
- [Social support including information about finances, tenancy and legal issues](#)
- [Student Advocacy](#) provides independent advice on MQ policies, procedures, and processes

Student Enquiries

Got a question? Ask us via [AskMQ](#), or contact [Service Connect](#).

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

We value student feedback to be able to continually improve the way we offer our units. As such we encourage students to provide constructive feedback via student surveys, to the teaching staff directly, or via the FSE Student Experience & Feedback link in the iLearn page.

Student feedback from the previous offering of this unit was very positive overall, with students pleased with the clarity around assessment requirements and the level of support from teaching staff. As such, no change to the delivery of the unit is planned, however we will continue to strive

to improve the level of support and the level of student engagement.

Changes since First Published

Date	Description
19/07/2024	-
17/07/2024	-

Unit information based on version 2024.04 of the [Handbook](#)