MOLS8002

Bioethics, Genes and Biotechnology

Session 2, In person-scheduled-weekday, North Ryde 2022

School of Natural Sciences

Contents

General Information

Unit convenor and teaching staff
Convenor, Lecturer, Tutor
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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; 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

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:

Late Assessment Submission Penalty

Unless a Special Consideration request has been submitted and approved, ***a 5% penalty (of the total possible mark) will be applied each day a written assessment is not submitted****, up until the 7th day (including weekends). After the 7th day, a mark of '0' (zero) will be awarded even if the assessment is submitted. Submission time for all written assessments is set at 11.55pm. A 1-hour grace period is provided to students who experience a technical issue.*

This late penalty will apply to non-timed sensitive assessment (incl essays, reports, posters, portfolios, journals, recordings etc). ***Late submission of time sensitive tasks*** *(such as tests/ exams, performance assessments/presentations, scheduled practical assessments/labs etc)* ***will only be addressed by the unit convenor in a Special consideration application. Special Consideration outcome may result in a new question or topic.***

Assessment Tasks

Name	Weighting	Hurdle	Due
Online Intro and film reflection	5%	No	11.55pm Fri 5 Aug (end of Week 2)
10 weekly quizzes	20%	No	11.55pm on Sunday of each week (Weeks 3-12 only)
Active Participation and Engagement	15%	No	Continuous
Essay	25%	No	EITHER 11.55pm Fri 16 Sept OR 11.55pm Fri 4 Nov
Essay Self-assessment	10%	No	EITHER 11.55pm Fri 16 Sept OR 11.55pm Fri 4 Nov
Online timed examination	25%	No	University Examination Period

Online Intro and film reflection

Assessment Type [1]: Participatory task
Indicative Time on Task [2]: 2.0 hours
Due: **11.55pm Fri 5 Aug (end of Week 2)**
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]: 15 hours
Due: **11.55pm on Sunday of each week (Weeks 3-12 only)**
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.

Active Participation and Engagement

Assessment Type [1]: Participatory task
Indicative Time on Task [2]: 10 hours
Due: **Continuous**
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.

Essay

Assessment Type [1]: Essay
Indicative Time on Task [2]: 25 hours
Due: **EITHER 11.55pm Fri 16 Sept OR 11.55pm Fri 4 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 11.55pm Fri 16 Sept OR 11.55pm Fri 4 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.

Online timed examination

Assessment Type [1]: Examination
Indicative Time on Task [2]: 23 hours
Due: **University Examination Period**
Weighting: **25%**

Students complete an online 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: It is expected that students will attend/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. The final examination will cover all sections of the unit.

General Submission Procedure: Essays and Essay Self-Assessments must be submitted via TurnItIn at the correct link provided on the Unit iLearn site. You may only make ONE submission, and 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. No re-submissions permitted.

DELIVERY:

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

Tutorials/STGAs will be either on campus or on zoom.

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 25): What is ethics? What is ethical reasoning? (A/Prof Lotz)

Required reading:

Cohen, S.: 'What is Ethics?

***NOTE**: NO TUTORIALS/STGAs in Week 1.*

WEEK 2 (beginning Aug 1): 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*.

NOTE: Online Discussion Exercise due: by 11.55pm Fri 5 August.

WEEK 3 (beginning Aug 8): 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 15): 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 22): 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 29): 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 5): 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.'

MONDAY 12 SEPT – FRIDAY 24 SEPT (inclusive): MID SEMESTER BREAK

*** ESSAY OPTION 1 DEADLINE: 11.55pm Friday 16 September**

WEEK 8 (beginning Sept 26): Genetic screening, testing and diagnosis – Is it always better to know? (Prof Lipworth)

Required reading:

Clarke, A. 'Genetic Screening and Counselling.'

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

WEEK 9 (beginning Oct 3): Should we edit the human genome for future generations? (Prof Lipworth)

NB: Monday Oct 3 is a public holiday. There will be **no on-campus lecture or tutorials/STGAs this week**. Instead this week's lecture is recorded and available in Echo360. On-campus lectures resume in Week 10. Please remember to listen to the lecture this week!

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 10): 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 17): 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 (Oct 24): 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'

*** ESSAY OPTION 2 DEADLINE: 11.55pm Friday 4 November**

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central (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). 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) 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 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

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