

---

# BIOL 507

## Biotechnology

Fall Term 2017

<b>Instructor</b>	<b>Dr. V. Walker</b>
<b>Instructor Contact</b>	<a href="mailto:walkervk@queensu.ca">walkervk@queensu.ca</a> Phone: 613-533-6123
<b>Office Hours</b>	See schedule on office door (2522) or anytime
<b>TA:</b>	No TA assigned
<b>TA Contact Information</b>	N/A
<b>Office Hours</b>	Mondays 2:30-4:30 (confirm with instructor)

### Learning Objectives

The goals of Biology 507 are to provide a safe place and an encouraging atmosphere for a free and open discussion of a wide range of controversial topics in the area of biotechnology. We will explore both background material and current research on a variety of biotechnologies. Discussion groups and seminars will cover the ethical, societal and environmental impacts of biotechnology. A major goal of the course is to provide materials that will provoke stimulating discussions involving critical analysis of public policy and the value of science to the public, as well as some focus on industry and the law. There will be regular assignments throughout the term. Specific topics will be controversial and will include human cloning, xenotransplants, genetic discrimination, stem cells, nanomaterials, synthetic biology, eugenics, astrobiology, patenting of genes, and the release of GMOs and biotechnologies to the environment. Plant biotechnology will not be covered in much detail since there is a separate seminar course for this topic.

**EXCLUSION** BIOL441\* (if taken first)

### Learning Hours

<i>Teaching method</i>		<i>Average hours per week</i>	<i>Number of weeks</i>	<i>Total hours</i>
In-class hours	Lecture	0.5	9	4.5
	Seminar	3	3	9
	Laboratory			
	Tutorial			
	Practicum (trial)	1.5	1	1.5
	Group learning	2.5	10	25
	Individual instruction			
Other	Online activity			
	Off-campus activity			
	Private study	7	10	70
<b>Total hours on task</b>				<b>110</b>

### Course Outline

1. Introduction to Biotechnology
2. Synthetic Biology
3. Nanotechnology

4. Cloning Mammals: How and why
5. Saving from extinction?: A case study and readings on the potential of biotechnology to save a species
6. Medical technologies I: Stem cells
7. Medical technologies II: Interspecies hybrids, xenotransplants or 3D printing?
8. Aquatic Biotechnology: A case study and readings on the challenges of implementing biotechnology
9. Barcoding all life?
10. Plant Biotechnology- A case study and a debate on “Great GMOs” or “Frankenfoods”: where do you stand?
11. The human genome: business, salvation and discrimination?
12. Eugenics
13. Panspermia or Pollution: protecting other worlds
14. DNA and the law: a case study on a human disease
15. The future?
16. Seminars on a new technology of your own devising

### **Textbooks/Readings**

A course book is available for purchase prior to the 1st week of classes from P&CC (purchase price covers the cost of production and copyright charges).

### **Grading Scheme**

<b>Component</b>	<b>Weight (%)</b>	<b>Date</b>
Seminar	20%	Mid-November
Term paper	25%	4 <sup>th</sup> week of Nov
Participation and regular assignments	22.5%	1 <sup>st</sup> day-end of Nov
In –class essay	27.5%	Mid-November
Referee evaluation	5%	Last day of class

### **Grading Method**

- All components of this course will receive letter grades which, for purposes of calculating your course average, will be translated into numerical equivalents using the Faculty of Arts and Science Letter Grade Input Scheme.

When letter grades are employed, the following scale will be employed for purposes of calculating your course average:

#### ***Arts & Science Letter Grade Input Scheme***

<b>Assignment mark</b>	<b>Numerical value for calculation of final mark</b>
A+	93
A	87
A-	82

B+	78
B	75
B-	72
C+	68
C	65
C-	62
D+	58
D	55
D-	52
F48 (F+)	48
F24 (F)	24
FO (0)	0

### **Academic Integrity and Queen's Code of Conduct**

Students are responsible for familiarizing themselves with the regulations concerning academic integrity and for ensuring that their assignments and conduct conform to the principles of academic integrity. Information is available in the Arts and Science Calendar (see Academic Regulation 1 - <http://www.queensu.ca/artsci/academic-calendars/regulations/academic-regulations>, on the Arts and Science website (see <http://www.queensu.ca/artsci/academics/undergraduate/academic-integrity>), and at Biology's website (<http://www.queensu.ca/biology/undergrad/integrity.html>) and from the instructor of this course. Departures from academic integrity include plagiarism, use of unauthorized materials, facilitation, forgery and falsification, and are antithetical to the development of an academic community at Queen's. Given the seriousness of these matters, actions which contravene the regulations on academic integrity carry sanctions that can range from a warning or the loss of grades on an assignment to the failure of a course to a requirement to withdraw from the university.

### **Accommodation Policy, Exam Conflicts, and Other Conflicts**

Students who feel they need accommodations for disabilities or extenuating circumstances, or have a conflict between exams or other commitments should consult the Biology Department's website for details about how to proceed (<http://www.queensu.ca/biology/undergrad/integrity.html>). In general, the earlier a course coordinator is apprised of an extenuating circumstance, the more likely an accommodation can be made. Students are encouraged to be proactive in anticipating difficulties, when it is possible to do so.

Students may apply to write a make-up or deferred exam if they have an exam conflict as defined in the Academic Regulations of the Faculty (See Arts and Science Calendar Regulation 8 - <http://www.queensu.ca/artsci/academic-calendars/regulations/academic-regulations>). In this case, the student should report to the Exams Office first to verify that there is a genuine exam conflict. Biology professors will not consider your situation to be a conflict unless it meets the criteria set out by the Faculty of Arts and Sciences.

Students may request a make-up or deferred exam if they have an exam conflict with off-campus travel associated with a field course (e.g BIOL-307/3.0 or 407/3.0) that is held during the fall or winter terms.

### **Copyright**

This material is designed for use as part of BIOL 507 at Queen's University and is the property of the

instructor unless otherwise stated. Third party copyrighted materials (such as book chapters and articles) have either been licensed for use in this course or fall under an exception or limitation in Canadian Copyright law.

### **Accommodation of Disabilities**

*Queen's University is committed to achieving full accessibility for persons with disabilities. Part of this commitment includes arranging academic accommodations for students with disabilities to ensure they have an equitable opportunity to participate in all of their academic activities. If you are a student with a disability and think you may need accommodations, you are strongly encouraged to contact the Disability Services Office (DSO) and register as early as possible. For more information, including important deadlines, please visit the DSO website at: <http://www.queensu.ca/hcds/ds/>*