ORIGINAL COURSE IMPLEMENTATION DATE: September 2008
REVISED COURSE IMPLEMENTATION DATE: January 2018
COURSE TO BE REVIEWED: (six years after UEC approval) August 2023
Course outline form version: 09/15/14

OFFICIAL UNDERGRADUATE COURSE OUTLINE FORM

Note: The University reserves the right to amend course outlines as needed without notice.

Course Code and Number: BIO 407	**Numberof Credits:** 3 Course credit policy (105)
Course Full Title: Applied Biotechnology **Course Short Title(if title exceeds 30 characters):**	
Faculty: Faculty of Science	**Department (or program if no department):** Biology

Calendar Description:

Biotechnology utilizes biological processes, organisms, or systems for human use. This course examines the application of biotechnology to disciplines such as genetics, biochemistry, microbiology, and molecular biology, and the impact these technologies have on medicine, industry, the environment, and agriculture.

Note: Students with credit for BIO 405 cannot take this course for further credit.

Prerequisites (or NONE):	BIO 201 and BIO 220. BIO 320 is recommended.
Corequisites(if applicable, or NONE):	
Pre/corequisites(if applicable, or NONE):	

Equivalent Courses (cannot be taken for additional credit)
Former course code/number:
Cross-listed with:
Equivalent course(s): **BIO 405**
Note: Equivalent course(s) should be included in the calendar description by way of a note that students with credit for the equivalent course(s) cannot take this course for further credit.

Transfer Credit
Transfer credit already exists: ☐ Yes ☒ No
Transfer credit requested (OReg to submit to BCCAT):
☐ Yes ☒ No(if yes, fill in transfer credit form)
Resubmit revised outline for articulation: ☐ Yes ☒ No
To find out how this course transfers, see **bctransferguide.ca**.

Total Hours: 45
Typical structure of instructional hours:

Lecture hours	45
Seminars/tutorials/workshops	
Laboratory hours	
Field experience hours	
Experiential (practicum, internship, etc.)	
Online learning activities	
Other contact hours:	
Total	**45**

Special Topics
Will the course be offered with different topics?
☐ Yes ☒ No
If yes, different lettered courses may be taken for credit:
☐ No ☐ Yes, repeat(s)☐ Yes, no limit
Note: The specific topic will be recorded when offered.

Maximum enrolment(for information only): 36

Expected frequency of course offerings (every semester, annually, every other year, etc.): every other year

Department / Program Head or Director: Allan Arndt	**Date approved:**	February 2017
Faculty Council approval	**Date approved:**	March 3, 2017
Campus-Wide Consultation (CWC)	**Date of posting:**	n/a
Dean/Associate VP: Lucy Lee	**Date approved:**	March 3, 2017
Undergraduate Education Committee (UEC) approval	**Date of meeting:**	August 31, 2017

Learning Outcomes

Upon successful completion of this course, students will be able to:

- Explain the theoretical basis of each of the various technologies.
- Determine the applicability and limitations of each technology to the specific objective of each situation and be able to develop strategies to address these issues.
- Analyze the economic and societal benefits of biotechnology and the potential problems associated with the application of each of these techniques in areas such as medicine, consumer goods, environmental protection, and agriculture.
- Critically review the most recent scientific literature on this topic.

Prior Learning Assessment and Recognition (PLAR)

☒ Yes ☐ No, PLAR cannot be awarded for this course because

Typical Instructional Methods (guest lecturers, presentations, online instruction, field trips, etc.; may vary at department's discretion)

Lectures, in-class discussions, and student presentations.

Grading system: Letter Grades:☒Credit/No Credit: ☐ Labs to be scheduled independent of lecture hours: Yes☐No ☐

NOTE: The following sections may vary by instructor. Please see course syllabus available from the instructor.

Typical Text(s) and Resource Materials (if more space is required, downloadSupplemental Texts and Resource Materialsform)

	Author (surname, initials) Title (article, book, journal, etc.)	Current ed.	Publisher	Year
1.		☐		
2.		☐		

Required Additional Supplies and Materials (software, hardware, tools, specialized clothing, etc.)

Material will be drawn from a number of sources including texts, journal articles, and government publications.

Typical Evaluation Methods and Weighting

Final exam:	40%	Assignments:	10%	Midterm exam:	25%	Practicum:	%
Term paper and presentation:	25%	Other:	%	Other:	%	Total:	100%

Typical Course Content and Topics

Week 1 Overview of biotechnology
Introduction to microbial biotechnology
Fermentation -principals of fermentation
Mutagenesis

Week 2 Fermentation - production of antibiotics and food additives
Industrial use of microbes - biomining, oil and gas production, recombinant microbes

Week 3 Protein Biotechnology
Protein sequencing, fusion proteins, protein engineering, site directed mutagenesis

Week 4 Introduction to genomics
Computers and biology
Database storage and utilization

Week 5 Medical Biotechnology
Tissue engineering
Artificial blood

Week 6 Medical Biotechnology
Disease diagnosis - marker technologies

Week 7 Medical Biotechnology
Gene therapy
Xenotransplantation

Week 8 Animal Biotechnology
Production and use of transgenic animals
Marker assisted breeding

Week 9 Plant Biotechnology
Plant Breeding
Tissue Culture

Week 10 Plant Biotechnology
Transgenic plants

Week 11 Biotechnology and Society
Ethics and perception
Government Regulation

Week 12 The business of biotechnology
Patents and living organisms
Technology protection systems
Technology use agreements

Week 13 Presentations