

BIOL 503

Plant Biotechnology

Fall Term (2014-15)

SCHEDULE

Seminar: Monday 10:00-11:30, Wednesday 8:30-10:00am. BIOSCI 2149

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|-------------------------------|--|
| Instructor | Dr. K. Ko |
| Instructor Contact | kok@queensu.ca Phone: 613-533-6155 |
| Office Hours | Please schedule by email or through other means |
| TA: | Not applicable |
| TA Contact Information | Not applicable |
| Office Hours | Please schedule by email or through other means |

Learning Objectives

The intention of this course's learning objectives is to give participants a broad exposure to the science behind the business of plant biotechnology and related socio-economic issues. This course gives an alternate view to why we do research, how we do research, and the need to be accountable to the public. Therefore, some of the topics will encompass legal and ethical issues. Students will learn how to extract and evaluate information from the web or other related commerce sources, practice developing commercialization strategies, learn how to prepare technology proposals, business plans and analyst reports, understand the science and implications of biotechnology patents, improve lay communication skills for non-scientists, carry out work as industry consultants, and perhaps learn of different career paths. Biol503 is considered an experiential course and thus provides real-world exercises as evidence of experience for the students to embark on different career paths.

Upon completion of this course, students will acquire competence in the business of science and demonstrate their ability to:

1. Invent and commercialize biotechnologies
2. Communicate strategically for the business world
3. Acquire skills used by industrial and business analysts
4. Carry out business consultant work in the plant biotechnology field as a team

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/Workshop | 3 | 5 | 15 |
| | Case Studies | 3 | 3 | 9 |
| | Laboratory | - | - | - |
| | Tutorial | 3 | 2 | 6 |
| | Practicum | - | - | - |
| | Group learning (almost everything is | 3 | 10 | 30 |

| | | | | |
|--|------------------------|---|----|-----|
| | group learning) | | | |
| | Individual instruction | - | - | - |
| Other | Online activity | - | - | - |
| | Off-campus activity | - | - | - |
| | Private study | 6 | 12 | 80 |
| Total hours on task (not double counting group learning) | | | | 110 |

Course Outline

The focus of the course is to look at the issues behind plant biotechnology, the steps leading to a transgenic (or non-transgenic) plant/product and its commercialization. Students will go through the process of developing their own ideas into a commercially valuable product, plus an assessment of all related social and economic issues. Scientific techniques such as plant cell tissue culture, plant transformation, plant development, genetics, gene expression, bioinformatics, and recombinant DNA techniques may be covered through a series of workshops, when considered appropriate. The schedule of core activities is given below.

PREREQUISITES BIOL 205 and (BIOL 301 or 341).

Tentative Schedule of Activities:

- Sessions may be held twice a week for seven to nine weeks, depending on class size.
- Some slots may be used for discussion, questions, brainstorming, communication workshops, work-flow strategies, patenting workshop, commercialization workshop, etc.
- Press Releases are due late September to early October.
- Email feedback for the Press Releases is due the week after for circulation.
- The case studies-presentations will be scheduled for late October.
- Depending on class size, the last three-four weeks of term will be used for layperson presentations, the "Sales Pitch".
- Feedback for the Sales Pitches is due the week after for circulation.
- Participation includes, but not limited to, attendance, interaction, feedback exercises, and peer review.
- The due date for the remaining two written assignments, business plan and analyst report, will be after the end of classes.

Textbooks/Readings

No required text for this course. Media articles, financial newspapers, primary literature and research reviews (Nature Biotechnology, Trends in Biotechnology and Current Opinions in Biotechnology), patents, and information available via the Internet. Reference articles may be recommended to facilitate discussion, etc.

Grading Scheme

| Component | Weight (%) | Date |
|---------------|------------|---------------------------------|
| Press Release | 10 | Late September to Early October |
| Case Study | 20 | Late October |

| | | |
|----------------|----|---------------|
| Sales Pitch | 20 | Late November |
| Business Plan | 20 | End of Term |
| Analyst Report | 15 | End of Term |
| Participation | 15 | All Term |

Grading Method

Assessment during the course will be carried out using numerical grades for each exercise or assignment. The compiled numerical grades are then converted to final letter course grades according to the Queen's University Faculty of Arts and Science Policy on Grading ([http://www.queensu.ca/artsci/sites/default/files/Policy on Grading.pdf](http://www.queensu.ca/artsci/sites/default/files/Policy%20on%20Grading.pdf)).

Your course average will then be converted to a final letter grade according to Queen's Official Grade Conversion Scale:

Queen's Official Grade Conversion Scale

| Grade | Numerical Course Average (Range) |
|-------|----------------------------------|
| A+ | 90-100 |
| A | 85-89 |
| A- | 80-84 |
| B+ | 77-79 |
| B | 73-76 |
| B- | 70-72 |
| C+ | 67-69 |
| C | 63-66 |
| C- | 60-62 |
| D+ | 57-59 |
| D | 53-56 |
| D- | 50-52 |
| F | 49 and below |

Academic Integrity and Queen's Code of Conduct

Academic integrity is constituted by the five core fundamental values of honesty, trust, fairness, respect and responsibility (see www.academicintegrity.org). These values are central to the building, nurturing and sustaining of an academic community in which all members of the community will thrive. Adherence to the values expressed through academic integrity forms a foundation for the "freedom of inquiry and exchange of ideas" essential to the intellectual life of the University (see the Senate Report on Principles and Priorities <http://www.queensu.ca/secretariat/senate/policies/princpri/>).

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.

Copyright

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<http://library.queensu.ca/copyright>

Disability Accommodations Statement

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/hc/ds/>