



School of Arts & Science
ENVIRONMENTAL TECHNOLOGY DEPARTMENT
ENVR 206B-X01A, X01B
Environmental Biotechnology
Semester/Year, 2007F

COURSE OUTLINE

The Approved Course Description is available on the web @ _____

Ω Please note: this outline will be electronically stored for five (5) years only.
It is strongly recommended students keep this outline for your records.

1. Instructor Information

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|-----|---------------|-----------------------------|--------------------|--|
| (a) | Instructor: | Anna Colangeli | | |
| (b) | Office Hours: | Posted on Office Door | | |
| (c) | Location: | Fisher 246 | | |
| (d) | Phone: | 370-3456 | Alternative Phone: | |
| (e) | Email: | colangel@camosun.bc.ca | | |
| (f) | Website: | http://online.camosun.bc.ca | | |

2. Intended Learning Outcomes

Upon completion of this course the student will be able to:

1. Culture and subculture plant explants under sterile conditions.
2. Use the tools of biotechnology, including DNA extraction techniques, restriction enzymes, agarose gel electrophoresis, PCR and protoplast fusion and discuss these molecular biology techniques.
3. Use Agrobacterium and tissue culture techniques to introduce a foreign gene into selected plants.
4. Explain the principles of bioremediation and phytoremediation.
5. Explain the principles of genetic engineering and biotechnological techniques and their application to agriculture and the environment.

3. Required Materials

- (a) Texts - none
- (b) Other – Envr 206B Lab Manual, 2007

4. Course Content and Schedule

Lecture: Y310 Tuesday 9:30 – 11:20
Labs: F222 Thursday 9:30 – 11:50 and 1:30 – 3:50

The schedule, which follows, is an attempt to outline the weekly activities of the class. It is subject to change or modification as the need arises.

| Week | Date | Lecture | Labs |
|------|-------------------|---|--|
| 1 | Sept. 4,6 | Introduction to Environmental Biotechnology: more than just Genetic Engineering | <ul style="list-style-type: none"> • Lab. 1 - Tissue Culture • Lab. 8 - Phytoremediation – start experiment |
| 2 | Sept. 11,13 | History of Biotechnology <ul style="list-style-type: none"> • Intro to Presentation | <ul style="list-style-type: none"> • Lab. 1 - Tissue Culture – continue • Lab. 8 Phytoremediation - continue |
| 3 | Sept. 18,20 | Review of DNA and Molecular Biology | <ul style="list-style-type: none"> • Lab. 1 – continue • Lab. 8 – continue • Lab. 2 - Isolation of DNA |
| 4 | Sept. 25,27 | Tools in Biotechnology <ul style="list-style-type: none"> • Recombinant DNA technology | <ul style="list-style-type: none"> • Lab 1, 8 -continue • Lab. 3 - Protoplast Fusion |
| 5 | Oct.2,4 | Tools continued... <ul style="list-style-type: none"> • Electrophoresis, PCR | <ul style="list-style-type: none"> • Lab 1,8 - continue • Lab. 4 - Restriction digests |
| 6 | Oct. 9,11 | Tools continued... <ul style="list-style-type: none"> • <i>Agrobacterium</i> and cloning | <ul style="list-style-type: none"> • Lab. 1 – continue • Lab. 8 – complete analysis • Lab. 4 - electrophoresis of digests |
| 7 | Oct. 16,18 | Exam #1 | <ul style="list-style-type: none"> • Labs 1, continue • Lab. 5 - Characteristics of <i>Agrobacterium</i> |
| 8 | Oct. 23,25 | Presentations | <ul style="list-style-type: none"> • Labs 1, 5 continue • Lab. 6 - PCR |
| 9 | Oct. 30 Nov. 1 | Presentations | <ul style="list-style-type: none"> • Labs 1, 5, 6 continue • Lab. 7 - Cloning of PCR product |
| 10 | Nov. 6,8 | NO CLASS | <ul style="list-style-type: none"> • Lab. 9 – Fermentation |
| 11 | Nov. 13,15 | Presentations | <ul style="list-style-type: none"> • Labs 1, 5 - continue • Lab. 7 - Cloning of PCR product |
| 12 | Nov. 20,22 | Presentations | <ul style="list-style-type: none"> • Completion of all labs |
| 13 | Nov. 27,29 | Presentations | <ul style="list-style-type: none"> • All assignments due |
| 14 | Dec. 4,6 | | |

5. Basis of Student Assessment (Weighting)

| | |
|------------------------------------|-----|
| Exam #1 (October 16) | 15% |
| Exam #2 (during final exam period) | 25% |
| Presentation | 20% |
| Lab. Worksheets and assignments | 40% |

Presentation Topics: Integrated Environmental Biotechnology

- Sustainable energy sources: wind, water, tides, solar
- Bioenergy: methane biogas and/or fuel cells, ethanol fermentation and/or biodiesel
- Bioremediation: cleaning up contamination; oil, heavy metals, solvents, other pollutants
- Biowastes: landfill, sewage or other sludge's
- Bioplastics: microbial, plants
- Phytoremediation: clever plants

6. Grading System
Standard Grading System (GPA)

| Percentage | Grade | Description | Grade Point Equivalency |
|------------|-------|---|-------------------------|
| 90-100 | A+ | | 9 |
| 85-89 | A | | 8 |
| 80-84 | A- | | 7 |
| 77-79 | B+ | | 6 |
| 73-76 | B | | 5 |
| 70-72 | B- | | 4 |
| 65-69 | C+ | | 3 |
| 60-64 | C | | 2 |
| 50-59 | D | Minimum level of achievement for which credit is granted; a course with a "D" grade cannot be used as a prerequisite. | 1 |
| 0-49 | F | Minimum level has not been achieved. | 0 |

Temporary Grades

Temporary grades are assigned for specific circumstances and will convert to a final grade according to the grading scheme being used in the course. See Grading Policy E-1.5 at camosun.ca for information on conversion to final grades, and for additional information on student record and transcript notations.

| Temporary Grade | Description |
|-----------------|---|
| I | <i>Incomplete:</i> A temporary grade assigned when the requirements of a course have not yet been completed due to hardship or extenuating circumstances, such as illness or death in the family. |
| IP | <i>In progress:</i> A temporary grade assigned for courses that, due to design may require a further enrollment in the same course. No more than two IP grades will be assigned for the same course. (For these courses a final grade will be assigned to either the 3 ^d course attempt or at the point of course completion.) |
| CW | <i>Compulsory Withdrawal:</i> A temporary grade assigned by a Dean when an instructor, after documenting the prescriptive strategies applied and consulting with peers, deems that a student is unsafe to self or others and must be removed from the lab, practicum, worksite, or field placement. |

7. Recommended Materials or Services to Assist Students to Succeed Throughout the Course

LEARNING SUPPORT AND SERVICES FOR STUDENTS

There are a variety of services available for students to assist them throughout their learning. This information is available in the College calendar, at Student Services or the College web site at camosun.ca.

STUDENT CONDUCT POLICY

There is a Student Conduct Policy **which includes plagiarism**.
It is the student's responsibility to become familiar with the content of this policy. The policy is available in each School Administration Office, at Student Services and on the College web site in the Policy Section.

ADDITIONAL COMMENTS AS APPROPRIATE OR AS REQUIRED