

COURSE SCHEDULE - BIOLOGY 206B – Fall 2004

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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. 8-9	Introduction to Environmental Biotechnology	<ul style="list-style-type: none"> • Tissue Culture techniques • Introduction to Mount. Washington field trip
2	Sept. 15-16	Review of DNA and Molecular Biology	<ul style="list-style-type: none"> • Lab. 1 - Characteristics of <i>Agrobacterium</i> • Lab. 2 Transformation • Mount Washington sample analysis
3	Sept. 22-23	Tools in Biotechnology - <i>Agrobacterium</i>	<ul style="list-style-type: none"> • Lab. 1 - Characteristics of <i>Agrobacterium</i> • Lab. 2 Transformation • Mount Washington sample analysis
4	Sept. 29-30	Tools: Recombinant DNA Technology - Restriction enzymes.	<ul style="list-style-type: none"> • Lab. 2 Transformation • Lab. 3 Isolation of DNA • Mount Washington sample analysis
5	Oct. 6-7	Tools: Gel electrophoresis	<ul style="list-style-type: none"> • Lab. 2 Transformation • Lab. 4 Protoplast fusions • Lab. 3 Quantification of DNA
6	Oct. 13-14	Quiz #1 - individual	<ul style="list-style-type: none"> • Lab. 2 Transformation • Lab. 5 Restriction digests
7	Oct. 20-21	NO LECTURE	<ul style="list-style-type: none"> • NO Lab
8	Oct. 27-28	Tools: Polymerase Chain Reaction	<ul style="list-style-type: none"> • Lab. 2 Transformation • Lab. 5 electrophoresis of digests
9	Nov. 3-4	Tools: Gene Cloning	<ul style="list-style-type: none"> • Lab. 2 Transformation • Lab. 6 PCR
10	Nov. 10	Biotechnology and Agriculture	<ul style="list-style-type: none"> • Remembrance Day • NO Lab
11	Nov. 17-18	Biotechnology and the Environment	<ul style="list-style-type: none"> • Lab. 2 Transformation • Lab. 7 Cloning of PCR product
12	Nov. 24-25	Presentations	<ul style="list-style-type: none"> • Lab. 2 Transformation • Lab. 2: Protein Bioassay • Lab. 7 Cloning of PCR product
13	Dec. 1-2	Presentations	<ul style="list-style-type: none"> • Lab. 8 phytoremediation • Completion of all labs
14	Dec. 8-9	Course overview	<ul style="list-style-type: none"> • All assignments due

Exam #1	15%
Exam #2 (during final exam period)	25%
Presentation	15%
Web page	5%
Lab. Worksheets and assignments	40%

CAMOSUN COLLEGE
ENVIRONMENTAL TECHNOLOGY DEPARTMENT

ENVR 206B ENVIRONMENTAL BIOTECHNOLOGY

Course Objectives

The student will be able to:

1. Culture and subculture plant explants under sterile conditions.
2. Successfully use the tools of biotechnology including DNA extraction techniques, restriction enzymes, *Agrobacterium*, agarose gel electrophoresis, PCR, PAGE, protein identification and protoplast fusion.
3. Be familiar and competent in molecular biology techniques.
4. Explain the principles of Biomimicry, bioremediation and phytoremediation.
5. Explain the principles of genetic engineering and biotechnological techniques and their application to agriculture and the environment.
6. Explain the principles and list the factual content of the course.

Course Outline

1. Introduction to Environmental Biotechnology

Overview of biotechnology pertaining to the Environmental field.

2. Plant Tissue Culture Techniques

Students should competently and efficiently work in laminar flow hoods, employing sterile techniques to culture and subculture plant tissue explants.

3. Plant Transformation and Molecular Biology

An overview of the principles and techniques involved in the transgenics or engineering of “designer “ organisms for industry, agriculture or for use in the environment. Use *Agrobacterium* and tissue culture techniques to introduce a foreign gene into selected plants.

4. Biological Degradation, Bioremediation and Phytoremediation

A look at the increasing use of microorganisms, microbial metabolic processes and plants to break down environmental poisons and clean soil and water.

5. PowerPoint Presentation

Groups of students will research an organism or methodology that has been or is being used in Biofuels, biomimicry, biodegradation, bioremediation, and phytoremediation or is a product of genetic engineering. The students will incorporate their findings into a PowerPoint presentation and present these to the other class members.

6. Websites

Each student will create a web site of useful links on the topic of their choice.

7. Final Exam

Understand the basic principles of the course.