CAMOSUN COLLEGE BIOLOGY 232
COURSE INFORMATION WINTER 2003

Instructor: Charles Molnar
Office: RH 302
Office Telephone: 370-3449
Biology 232 sec.01 Lectures M,W,Th 2:30-3:20
Laboratory R. (F-224) 2:30-5:20
Lab Assistant:
Weekly Schedule: 3 hours of lecture and 3 hours of lab. Expect to spend an additional **6** hours week on this course outside of class time.

Text: (Available in the College Bookstore)
1. iGenetics Russell 1st Ed.BenjaminCummings.
2. Biology 232 Lab Manual. Available at the bookstore

Additional Reference Material:
There is a selection of genetic reference books in the library . Other suggested and optional reading will be given in class. Three basic genetics texts are on reserve in the library;
1. Griffiths et al, Snustad et al, and Russell. These can be checked out for 2 hours or over night.

Mark Distribution: (Tentative)

LECTURE	
Midterm Exam 1	12.5%
Midterm Exam 2	12.5%
Final Exam	30%
Assignments/Quizzes/Lab assign.	10 %
Scrapbook	5%
	70%
LABORATORY	
Midterm test	10%
Second test	10%
Term Project/Presentation	10%
	30%

The final lecture exam will cover the whole course. The emphasis of the final exam will be on material covered in the last third of the lectures. Please check your final exam schedule to insure there are no conflicts.

Please be sure to read and comply with the general department policies listed in your lab manual.

Late Assignments: If assignments are handed in late they will be marked down accordingly (15% per day-weekends count as one day)and may be refused if the other student assignments have already been returned.

Absences: If you should miss a class, you should arrange to borrow notes from another student in this class as **you are responsible for all information (including exam dates and changes in course content or emphasis)** covered in class. If you miss an exam you will receive a grade of zero for that exam unless you give me a note from your doctor.

Consultation: My office hours will be announced in the first week of classes. For an appointment during non-office hours or to leave a message call 370-3449 anytime.

This outline is meant to be a useful but not un-changeable guide. Any major additions or deletions will be announced in class.

Letter Grades:

We are now on a nine point letter grading system. The approximate percentage breakdown is as follows:

Boundary between A+ and A :	95%
Boundary between A and A- :	90%
Boundary between A- and B+ :	85%
Boundary between B+ and B :	80%
Boundary between B and B- :	75%
Boundary between B- and C+ :	70%
Boundary between C+ and C :	65%
Boundary between C and D:	60%
Boundary between D and F:	50%

Genetics videos

Listed below are the genetics videos on reserve at the library. They can be checked out from the circulation desk and viewed in the A.V. area.

1. **Genetic Defects : The Broken Code**. RB 155 G4. 2 Cassettes Examines the problems of genetics defects and deformities passed through recessive, dominant and sex linked patterns of inheritance. Topics include: Medical genetics. Medical screening. Genetic counseling.

2. QP 551 P76 A series of 6 videos each about 10 minutes long.

1. DNA replication. 2. DNA, the molecule of heredity.
3.Protein, the stuff of life. 4. Transfer RNA
5. Ribosomal RNA 6. RNA synthesis

3. **Life Revolution The Series**. 5 Videos. QH 442 L53 The complex moral dilemmas posed by genetic engineering. The possible uses and abuses in medicine and weapons are considered.

1. Secrets of Life. A history of genetic engineering
2. All in the family. Genes and behavior - Gene therapy.
3. Growing Pains. Plant and animal hybrids in the agricultural revolution.
4. Blue Collar Bugs. Use of engineered microbes for environmental clean-up.
5. Cell Wars. Genetic tools and the treatment and dectection of fatal human diseases like cancer and A.I.D.S.

4. **Winding your way through DNA**. A public symposium on the possibilities and social puzzles of DNA technology. 6 videos. QP 624 W56

Parts 1 and 2: **Discovering the wonder of DNA**
Parts 3 and 4: **New ways to use DNA.**
Parts 5 and 6: **Asking Tough Questions About the uses of DNA Technology.**

5. QH 426.5 G454 A series of 11 videos (each about 25 minutes long) including:

1. Genetic manipulation of wheat. 2. Genetic engineering 3. **Plant and animal breeding** 4. Heavy metal tolerance 5. **The rII system** 6. Genes on the circle line 7. Polymorphisms in snails 8. Past present and future9. **How to build a phage** 10. **Catch your mutant**
11. Molecular evolution

6. Making Perfect Babies. New Genetic technologies: implications and ethics. RG 133.5 058

7.Murder,Rape and DNA Explores the use of Genetic testing in forensic work. RA 1057.55 M9

Careers in genetics

Training:

University degree in Science - a B.Sc. usually in one of the following areas Biochemistry, Microbiology, Genetics, Animal Science or Botany.
Masters degree and/or a Doctorate (Ph.D.) or a medical degree (M.D.)

Careers:

Technician - assisting in the completion of scientific research or industrial genetics projects.
Plant or animal breeding - crossing plants or animals to enhance or develop desirable caracteristics. For example faster race horses, greater milk production from cows, new fruit varieties.

Genetic Engineering

Industrial applications usually involves the moving of genes for one organism to another so that a rare product can be produced and isolated. For example bacteria can be made to produce human insulin.

Legal careers: The R.C.M.P. use this technology to identify suspects in criminal investigations. This is called genetic fingerprinting. It is also used in paternity suits.

Academic careers: There are many branches of science where the understanding of genetics can be applied to research. Teaching careers are possible as well.
Medical careers: Hospitals often employ genetic counselors to advise patients which inherited disorders such as Downs syndrome (in about 30% of children admitted to hospital there is a genetic component to their disorder). Some doctors also do research into genetic diseases like hemophila. There is currently some gene therapy in limited use in medicine. This is where people with defective genes are treated with normal genes in the hope that this will correct their defect.

Biology 232 Problem Solving Guide

Whether working on your own, doing an assignment or writing an exam, solving Genetics problems demands an organized, disiplined approach. I have taught students to solve Genetics problems for 20 years. I have often seen students spend many hours trying to solve a simple problem because of poor problem solving technique. Here are my recommendations.

Do not attempt to solve a genetics problem in your head. Use paper and be neat or organized. Develop a routine to use on all problems.

Steps to follow:

1. Read the entire problem.

2. Define any terms that are not clearly understood.

3. Be clear about what form the answer should take; will it be a ratio, a cross, a measurement, a genotype, or a probability.

4. Often you may have to 'reduce' some data into a recognizable ratio.
ie. 110 red: 241 blue: 122 green reduces to a 1:2:1 ratio.

    You should create a table of ratios and their meaning.
    ie. a 3:1 ratio = monhybrid with complete dominance,
    a 1:2:1 ratio = monohybrid with incomplete or co-dominance.

5. Create a written key using appropriate Genetic symbols.
ie. Blue phenotype=BB or Bb genotype.

6. Write out all crosses carefully and completely.

    a. Write out the complete genotypes of parents. Remember haploids have one allele and diploids have two.
    b. Write out what types of gametes are produced by each parent and in what proportions they are produced.
    c. Create and fill in the Punnett square.

I will expect that students who come to me for help with problems to have followed this guide.

Genetic Terminology

Briefly define the following terms. Your definitions are to be handed in on Jan.___

gene

allele

centromere

diploid

haploid

autosome

sex chromosome

homologous chromosome

metacentric

acrocentric

telocentric

2n

karyotype

locus/loci

cell cycle

mitosis

meiosis

prophase

prophase 1

sister chromatids

non-sister chromatids

tetrads (chromosomes)

synapsis

crossing over

heterozygous / homozygous

phenotype

genotype

You may wish to create one or several concept maps to try out that method of learning.