Registrar

GRANDE PRAIRIE REGIONAL COLLEGE
DEPARTMENT OF SCIENCE
GENETICS OF EUCARYOTES AND CYTOGENETICS
COURSE OUTLINE: GN375 WINTER 1992

COURSE OBJECTIVES:

The principle objective of the course is to present students with a survey of the principles of genetics, with an emphasis on eucaryotic genetics. Students should gain a strong understanding of the complexity of the genetic apparatus in eucaryotes and procaryotes, the nature of gene regulation, and the role of recombinant DNA technology in contemporary research. In addition, students should be introduced to several specialty areas in genetics, including quantitative, population and developmental genetics.

INSTRUCTOR:	Dr. David C. Creasey office: J224 phone: 539-2863
PREREQUISITE:	B1297 Heredity
TEXTBOOK:	Klug, W.S. and M.R. Cummings, Concepts of Genetics, (3rd edition) Collier Macmillan Canada Inc., Toronto, 1991. (required)
DICTIONARY:	King, R.C. and W.D. Stansfield, A Dictionary of Genetics, (4th edition) Oxford University Press, New York, 1990. (optional)
LAB MANUAL:	Genetics 275, 1991-92, Genetics of Higher Organisms Laboratory Manual, Department of Genetics, University of Alberta. (required)
LECTURES:	PLACE: J227 TIME: Tuesdays & Thursdays 13:30-14:50
LABORATORIES:	PLACE: J126 (Blue Lab) TIME: L1: Thursdays 08:00-10:50

EVALUATION:	
Assignments, Labs, Quizzes	30%
Mid-Term Test	20%
Term Paper and Seminar	20%
Final Course Examination	30%

** LATE ASSIGNMENTS WILL NOT BE GRADED WITHOUT PRIOR APPROVAL **

** SOME QUIZZES MAY BE UNANNOUNCED **

COURSE DESCRIPTION

GN375 presents a comprehensive survey of the principles of genetics. After a brief review and refining of Mendelian genetics, DNA replication, the genetic code, transcription, translation, and the relationships between genes and proteins will be reviewed on a molecular level. Students should have a strong command of required text chapters 1-13 inclusive, within 2 weeks of entering the course.

A laboratory component accompanies the lectures and is an integral component of the course. The course is comprised of 3 hours of lecture material and 3 hours of laboratory participation each week. Topics will include: gene mutation, mutagenesis and DNA Repair; bacterial and phage genetics; an introduction to recombinant DNA technology; higher order eucaryotic chromosome structure; the organization and structure of genes; genetic regulation in bacteria, bacteriophage, and eucaryotes; an introduction to developmental genetics, quantitative genetics, behavioral genetics, population genetics, and extrachromosomal inheritance. Additional topics may be discussed. Owing to the comprehensive nature of the course and the broad concepts and topics involved, STUDENTS ARE REQUIRED TO READ TEXT AND ASSIGNED MATERIALS IN ADVANCE OF LECTURES AND LABS.

A comprehensive term paper and student seminar presentation will be required from all students. A choice of topics will be provided early in the semester. Topics should be chosen before the end of January and literature searches completed by the end of February (you will probably need to use interlibrary loans; a U. of A. library field trip is also tentatively planned... see below). Students should expect to incur some costs in the preparation of their term papers and seminars for such things as literature searches, photocopying, transparencies, and typing. Term papers will be due one week before the seminar presentation, and will not be returned to the student. Each student will be expected to provide each other student and the instructor with an abstract of the seminar presentation one week in advance.

An optional field trip may be offered for students wishing to gain experience in using library facilities at the University of Alberta. The trip would take place on the first or second weekend in February. Students would be introduced to the U. of A. library, computer search techniques, the use of Science Citation Index and Current Contents, and general "research topic hunting". The trip would primarily be for accumulation of literature regarding the assigned term paper and seminar presentation. Transportation would be provided, but students would be responsible for 2 nights lodging, meals, and other expenses.

RESOURCE MATERIAL

The LRC has many texts and books covering a wide range of subjects in genetics (look in section QH on the second floor). An excellent resource for terminology used in this course (and an optional supplemental book for students) is King and Stansfields' A Dictionary of Genetics (fourth edition), located in the reference section of the LRC. In addition to these holdings, the LRC offers many audio/visual resources for students of heredity, with the necessary machinery to view/hear these resources. Students are strongly encouraged to use all LRC resources. The LRC also offers comprehensive computer literature searches, interlibrary loans and photocopying, and on-site photocopying at reasonable rates.

TENTATIVE ASSIGNED TEXT READINGS AND TOPIC PRESENTATION

Review (chapters 1-13)

Gene Mutation, Mutagenesis and DNA Repair (chpt 14)

Bacterial and Phage Genetics (8:229-230)(chpt 15)

Recombinant DNA (9:250-258)(chpt 16)

Structure and Organization of DNA and Chromosomes(9:246-249)(9:258-261)(chpt 17)

Organization and Structure of Genes (chpt 18)

Genetic Regulation in Bacteria and Bacteriophage (chpt 19)

Genetic Regulation in Eucaryotes (chpt 20)

Developmental Genetics (chpt 21)

Extrachromosomal Inheritance (chpt 22)

Quantitative Genetics (4:88-96)(chpt 23)

Behavioral Genetics (chpt 24)

Population Genetics (chpt 25)

Evolutionary Genetics (chpt 26)

TENTATIVE LABORATORY SCHEDULE

Jan. 9	No Lab
Jan. 16	Introduction to Drosophila Genetics
Jan. 23	Polytene Chromosomes I
Jan. 30	Polytene Chromosomes II
Feb. 6	Human Pedigrees - Chromosome Banding and Karyotyping
Feb. 13	Mutagenesis
Feb. 20	No Lab (Midterm Week)
Feb. 27	No Lab (Reading Week)
Mar. 5	DNA Isolation and Analysis
Mar. 12	DNA Restriction Analysis
Mar. 19-Apr. 2	Student Seminars