Grande Prairie Regional Regional College
Department of Science

Course Outline : BI 2070 Molecular Genetics and Heredity Fall 1998

Description : Biology 2070 is a course dealing with both classical and molecular genetics. The chromosomal and molecular basis for the transmission and function of genes will be covered as well as the construction of genetic and physical maps of genes and genomes. Molecular biology strategies for isolation of specific genes and examples of regulatory mechanisms for the expression of the genetic material in both prokaryotes and eukaryotes will also be discussed.

Instructor : Dr. Sean Irwin
Office: J223
Phones: 539-2860 (Office)
538-1278 (Home)

Prerequisite : BI 1070

Required Text : Griffiths, Miller, Suzuki..., An Introduction to Genetic Analysis (6th Edition), W. H. Freeman and Company, New York, 1996.

Lab Manual : U. of A. 1997-98 BI 2070 Lab Manual

Lectures : Place: J 226
Time: M, W, F - 13:00-13:50

Labs : Place: J 126
Time: Wed. 15:00-17:50

Evaluation :

Lab Assignments/Problem Sets	- 25%
Midterm Exam	- 25%
Final Lab Exam	- 10%
Final Exam	- 40%

Office Hours : Tuesday - 14:00-15:00
Wednesday - 14:00 - 15:00
Friday - Cloning and Coffee -10:00 - 11:00 in the cafeteria

Course Outline

Lect.	Date	Topic	Chapter
1	Sept 2	Introduction	
2	Sept 4	Genes and proteins	Ch. 12:341-45; 369-73
	Sept 7	Labour Day	
3	Sept 9	DNA : The genetic material	Ch. 11: 313-24
4	Sept 11	Organization of DNA Replication	Ch. 11:326-36
5	Sept 14	Mutation I	Ch. 18
6	Sept 16	Mutation II	Ch. 7:181-99
7	Sept 18	Genome Organization and Life Cycles	Ch. 8:211-16; Ch.3:76-8
8	Sept 21	Chromosome Behaviour in Meiosis	Ch. 3:58-64
9	Sept 23	The Genetic Implications of Meiosis	Ch. 3:77-8; Ch. 6:159-66
10	Sept 25	Alleles, Dominance and Segregation	Ch. 2:22-28
11	Sept 28	Independent assortment	Ch. 2:28-32
12	Sept 30	Sex Chromosomes and Sex-linkage.	Ch. 3:64-76
]13	Oct 2	Pedigree Analysis.	Ch. 2:32-36
14	Oct 5	Pedigree Analysis	
15	Oct 7	Gene Interactions	Ch. 4:92-95
16	Oct 9	Epistasis.	Ch. 4:98-109
	Oct 12	Thanksgiving Day	
17	Oct 14	Linkage.	Ch. 5:124-31
18	Oct 16	Mapping Genes on Chromosomes	Ch. 5:126-34
19	Oct 19	Mapping Genes	
20	Oct 21	Midterm Exam on Lectures 1-18	
21	Oct 23	Changes in Chromosome Number	Ch. 9
22	Oct 26	Chromosome Rearrangements	Ch. 8
23	Oct 28	Physical Mapping of Genes	Ch. 14:449-51
24	Oct 30	Physical Mapping of Genes	Ch. 14:449-51
25	Nov 2	Cloning DNA and Identifying Genes	Ch. 14:424-30
26	Nov 4	Construction of Gene Libraries	Ch. 14:430-36
27	Nov 6	Isolation of Genes from Libraries I	Ch. 14:437-38
28	Nov 9	Isolation of Genes from Libraries II	Ch. 14:439-40
	Nov 11	Remembrance Day	
29	Nov 13	RFLP's	Ch. 15:472-86
30	Nov 16	Using RFLPs to Locate Genes.	Ch. 15:482-86
31	Nov 18	Regulation of Gene Expression.	Ch. 17:546-62
31	Nov 20	Operons	Ch. 17:547-54
32	Nov 23	The lac Operon.	Ch. 17:554-55
33	Nov 25	Eukaryote Genome Organization.	Ch. 16
34	Nov 27	Structure of eukaryotic genes.	Ch. 13:409-16; Ch. 17:564-79
35	Nov 30	The Formation of Hemoglobins.	Ch. 12;345-50; Ch. 8:224
36	Dec 2	Beta-globin switching.	Ch. 8:224
37	Dec 4	Review	