

**Grande Prairie Regional Regional College**  
**Department of Science**

**Course Outline :** BI 2070    Molecular Genetics and Heredity    Fall 2003

**BI 2070 Molecular Genetics and Heredity 3(3-0-3)**

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)  
518-3764 (Home)

**Prerequisite :** BI 1070

**Required Text :** Fairbanks, D.J. and Andersen, W.R., Genetics: The Continuity of Life, International Thompson Publishing Company, New York, 1999.

**Lab Manual :** U. of A. 2003-2004 BI 2070 Lab Manual

**Lectures :** Place: J 204  
Time: M, W, 8:30- 9:50

**Labs :** Place: J 126  
Time: Tues. and Thurs. : 10:00 - 12:50

**Evaluation :**

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

**Office Hours :** Monday - 10:00 - 11:20 am  
Wednesday - 10:00 - 11:20 pm  
Friday -10:00 – 11:20 am  
Also by appointment

## Course Outline

<b>Lect.</b>	<b>Date</b>	<b>Topic</b>	<b>Chapter</b>
1	Sept 3	Introduction	
2	Sept 8	Important Experiments	2.1 – 2.3
3	Sept 10	DNA / Chromosome Replication	2.4, 2.5
4	Sept 15	Genes and Proteins	4.9, 6.3
5	Sept. 17	Mutation	5.1 – 5.3
6	Sept. 22	Prokaryotic Genes and Operons	7.2, 8.1, 8.2
7	Sept 24	Eukaryote Genes and Globin Genes	10.1,10.3, 8.5, 8.6,6.1
8	Sept 29	Genome Organization and Life Cycles	11.1, 11.4
9	Oct. 1	Chromosome Behaviour in Meiosis	11.2, 11.3, 12.2
10	Oct. 6	Segregation and Independent Assortment	12.1, 12.3, 12.4, 12.6
11	Oct. 8	Sex Chromosomes and Sex-linkage	14.1 – 14.6
	Oct. 13	Thanksgiving	
12	Oct. 15	Pedigree Analysis	12.5, 14.4
13	Oct. 20	Gene Interactions	13.1- 13.3
14	Oct. 22	Midterm I	
15	Oct. 27	Linkage	15.1, 15.2
16	Oct. 29	Mapping Genes on Chromosomes	15.3, 15.4
17	Nov. 3	Mapping the Internal Structure of Genes	16.6
18	Nov. 5	Changes in Chromosome Number and Structure	17.1 – 17.4
	Nov. 10	Fall Break	
19	Nov. 12	Physical Mapping of Genes	15.7, 9.1
20	Nov. 17	Clones and Libraries	9.2 – 9.4
21	Nov. 19	Identifying Genes I	9.4, 9.8
22	Nov. 24	Identifying Genes II	16.5, 15.8
23	Nov. 26	RFLP I	13.4, 26.3
24	Dec. 1	RFLP II	15.8, 26.2
25	Dec. 3	Selected Topic	
26	Dec. 8	Review	

**Biology 2070**  
**Lab Schedule Fall 2003**  
**Thursday 10:00 – 12:50**

September 4	No Lab
September 9, 11	Lab 1 Orientation and mitosis
September 16, 18	Lab 2a Gene induction and start 3 biochemical pathways
September 23, 25	Lab 2b, Finish Lab 3 and set up yeast strains for lab 4
October 30, 2	Finish Lab 4 - complementation and UV Irradiate yeast for lab 5
October 7, 9	Finish Lab 5 and do rye meiosis lab 6a
October 14, 16	Lab 6b <i>Sordaria</i> meiosis lab 6b
October 21, 23	Lab 7 monohybrid crosses fruit flies
October 28, 30	Lab 8 dihybrid crosses fruit flies, preamble to 10
November 4, 6	Lab 9 <i>Sordaria</i> tetrad analysis, proposal for 10 due.
November 11, 13	Lab 10 start DNA ligation and transformation
November 18, 20	Lab 10 cont. extraction and DNA digestion
November 25, 27	Finish Lab 10
Dec 2,4	Lab Exam