



DEPARTMENT OF SCIENCE

COURSE OUTLINE – WINTER 2014

GN 2700 – FOUNDATIONS OF MOLECULAR GENETICS

INSTRUCTOR: Dr. Shauna Henley, **PHONE:** 539-2439
PhD

OFFICE: J215 **E-MAIL:** SHenley@gprc.ab.ca

OFFICE HOURS: Mon. 2:30 – 3:30; Wed 1:30 –2:30; Thurs 10:30 – 11:30

PREREQUISITE(S)/COREQUISITE: BI 2070

REQUIRED TEXT/RESOURCE MATERIALS:

Textbook: “Principles of Genetics” by Snustad & Simmons, 6th edition, John Wiley & Sons Inc., 2012.

Papers: A set of historical journal articles have been selected for this course and will be available on Moodle. The papers will be studied during the seminar sessions and students will be tested on their content.

CALENDAR DESCRIPTION: Basic concepts on the organization of genetic material and its expression will be developed from experiments on bacteria and viruses during the course.

CREDIT/CONTACT HOURS: 3 Credits (3-1.5-0) UT, 67.5 hours

DELIVERY MODES: Lectures – Mon. 1:00 - 2:20 & Thurs. 11:30 - 12:50, J204
Seminars – Mon. 4:00 - 5:20, J204

COURSE OUTCOME: Students will gain a deeper understanding of bacterial molecular genetics, from a historical to contemporary perspective. Emphasis will be placed on the ability to analyze and interpret primary literature related to molecular genetics.

TRANSFERABILITY: UA, UC*, UL, AU, AF, CU

*Check Alberta transfer guide.

** Grade of D or D+ may not be acceptable for transfer to other post-secondary institutions. Students are cautioned that it is their responsibility to contact the receiving institutions to ensure transferability.

GRADING CRITERIA:

GRANDE PRAIRIE REGIONAL COLLEGE			
GRADING CONVERSION CHART			
Alpha Grade	4-point Equivalent	Percentage Guidelines	Designation
A⁺	4.0	90 – 100	EXCELLENT
A	4.0	85 – 89	
A⁻	3.7	80 – 84	FIRST CLASS STANDING
B⁺	3.3	77 – 79	
B	3.0	73 – 76	GOOD
B⁻	2.7	70 – 72	
C⁺	2.3	67 – 69	SATISFACTORY
C	2.0	63 – 66	
C⁻	1.7	60 – 62	
D⁺	1.3	55 – 59	MINIMAL PASS
D	1.0	50 – 54	
F	0.0	0 – 49	FAIL
WF	0.0	0	FAIL, withdrawal after the deadline

EVALUATIONS: Midterm Exam – 30%

Seminar – 30%

Final Exam – 40%

The midterm will be held during class on **Thursday February 27, 2014**. The final exam will be cumulative and will be held during the exam period. Failure to write quizzes, the midterm or the final exam will result in a grade of zero, unless proper documentation is provided.

STUDENT RESPONSIBILITIES: Students are expected to attend all classes and seminars. All assignments must be completed in full and handed in by the date specified.

STATEMENT ON PLAGIARISM AND CHEATING:

Refer to the Student Conduct section of the College Admission Guide at <http://www.gprc.ab.ca/programs/calendar/> or the College Policy on Student Misconduct: Plagiarism and Cheating at www.gprc.ab.ca/about/administration/policies/

**Note: all Academic and Administrative policies are available on the same page.

COURSE SCHEDULE:

Topics	Required Text Readings (pages)
1. Introduction to GN 2700	11-15
2. Genetic concepts	333-5, 340-6, *O393-9
3. DNA structure	197-203
4. DNA replication	220-243, 245-250
5. Phage DNA replication	268, 243-4
6. Central Dogma	256-71, 286-313
7. T4 Genetic Analysis	163-6, 306-11, 342-6, *O393-405
8. Transformation	172-5
10. Transduction	182-5
11. Plasmids and Conjugation	175-82
12. Transposition	477-83, 488-93
13. Mutation	313-4, 321-31, 333-6, 346-7, 498-9
14. DNA Repair	348-53
15. Recombination	354-8, 450-5, 467-9
16. Gene expression	504-23
17. Lambda phage	166-9, 228-30
18. Techniques of Molecular Genetics	366-89, 397-99, 403-5, 409-14, 424-26, 463-66, 471-2

*These pages are available online, in the link for 'Definitions of the Gene'

GN 2700 Seminar Schedule

Week of:	Topic/Papers	Quiz
Jan 13	DNA, 1.1	----
Jan 20	T4 phage, 2.1	DNA
Jan 27	DNA replication, 15.2	T4 phage
Feb 3	Fine structure mapping, 5.1	DNA replication
Feb 10	Genetic Code/mutation, 11.2 & 12.2	Fine structure mapping
Feb 17	Winter Break	----
Feb 24	Mutagenesis, 11.1 & 13.1	Genetic code & mutation
Mar 3	DNA Repair, 13.2	Mutagenesis
Mar 10	Recombination	DNA repair
Mar 17	The Lac Operon, 23.1 & 24.2	Recombination
Mar 24	Restriction Enzymes, 6.3	The Lac Operon
Mar 31	Cloning/sequencing, 8.2 & 9.1	Restriction Enzymes
Apr 7	----	Cloning/sequencing

For the seminar section of this course, you will be assigned one of the topics above. Using the paper(s) assigned, you will prepare a presentation based on this topic and present to your classmates. Everyone will be responsible for reading and understanding each paper **prior** to the date presented. We will have quizzes every week that will cover the content in these papers.

The marks for the seminars will be assigned as follows:

Quizzes (11 in total)	25%
<u>Presentation</u>	<u>5%</u>
Total	30%