



DEPARTMENT OF SCIENCE

COURSE OUTLINE – WINTER 2019

**GN2700 A3: FOUNDATIONS OF MOLECULAR GENETICS – 3 (3-1.5-0), 67.5 HOURS
FOR 15 WEEKS**

INSTRUCTOR: Dr. Shauna Henley, **PHONE:** 780-539-2439
PhD

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

OFFICE HOURS: Monday 12:20 – 1:00; Tuesday 10:30 – 11:30; Wednesday 9:00 –
10:00; Thursday 10:30 – 11:30; Friday 11:00 – 12:00

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.

PREREQUISITE(S)/COREQUISITE: BI2070

REQUIRED TEXT/RESOURCE MATERIALS:

Textbook: “Principles of Genetics” by Snustad & Simmons, 7th edition, John Wiley & Sons Inc., 2016.

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.

DELIVERY MODES: Lectures – Tues. & Thurs. 11:30 - 12:50, J203
Seminars – Mon. 1:00 - 2:20, J203

COURSE OBJECTIVES: 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.

LEARNING OUTCOMES:

1. To gain an understanding of how prokaryotes exchange genetic information.
2. To understand the molecular basis for processes such as replication, transcription, translation, mutation, DNA repair and recombination.
3. To comprehend how gene expression is regulated in prokaryotes and viruses.
4. To develop the ability to analyze and report the findings of scientific experiments.
5. To foster critical thinking skills.

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

***Warning:** Although we strive to make the transferability information in this document up-to-date and accurate, **the student has the final responsibility for ensuring the transferability of this course to Alberta Colleges and Universities.** Please consult the Alberta Transfer Guide for more information. You may check to ensure the transferability of this course at Alberta Transfer Guide main page <http://www.transferralberta.ca> or, if you do not want to navigate through few links, at <http://alis.alberta.ca/ps/tsp/ta/tbi/onlineSearch.html?SearchMode=S&step=2>

** 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.**

EVALUATIONS: Midterm Exam – 30%
Seminar – 30%
Final Exam – 40%

The midterm will be held during class on **Thursday February 14**. 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.

GRADING CRITERIA: Please note that most universities will not accept your course for transfer credit **IF** your grade is **less than C-**.

Alpha Grade	4-point Equivalent	Percentage Guidelines		Alpha Grade	4-point Equivalent	Percentage Guidelines
A+	4.0	90-100		C+	2.3	67-69
A	4.0	85-89		C	2.0	63-66
A-	3.7	80-84		C-	1.7	60-62
B+	3.3	77-79		D+	1.3	55-59
B	3.0	73-76		D	1.0	50-54
B-	2.7	70-72		F	0.0	00-49

COURSE SCHEDULE:

Topics

Required Text Readings (pages)

	6 th ed.	7 th ed.
1. Introduction to GN 2700	11-15	11-15
2. Genetic concepts	333-5, 340-6, *O393-9	314-5, 329-32 *O393-9
3. DNA structure	197-203	194-9
4. DNA replication	220-243, 245-250	217-39, 241-6
5. Phage DNA replication	230, 243-4	227, 240
6. Central Dogma	256-71, 286-313	252-66, 281-307
7. T4 Genetic Analysis	163-6, 306-11, 342-6, *O393-405	161-4, 302-4, 329-32, *O393- 405
8. Transformation	172-5	170-3
10. Transduction	182-5	180-3
11. Plasmids and Conjugation	175-82	173-80
12. Transposition	477-83, 488-93	**WC(ch21)1-6, 11-17
13. Mutation	313-4, 321-38, 346-7, 498-9	307-8, 313-29, **WC(ch21)22- 23
14. DNA Repair	348-53	333-8
15. Recombination	354-8, 450-5, 467-9	338-42, 426-31 442-5

16.	Gene expression	504-23	459-78
17.	Lambda phage	166-9, 228-30	164-7, 225-7
18.	Techniques of Molecular Genetics	366-89, 397-99, 403-5, 409-14, 424-26, 463-66, 471-2	350-72, 379-81 384-5, 387-95 401-4, 439-42 446-54

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

***These pages are available online, in the chapters provided by the publisher*

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. Refer to the College Policy on Student Rights and Responsibilities at https://www.gprc.ab.ca/about/administration/policies/#academic_policies

STATEMENT ON PLAGIARISM AND CHEATING:

Cheating and plagiarism will not be tolerated and there will be penalties. For a more precise definition of plagiarism and its consequences, 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.