DEPARTMENT OF SCIENCE

COURSE OUTLINE – FALL 2017

BI1070 A3 – INTRODUCTION TO CELL BIOLOGY 3 (3-1-3) , 105 HOURS FOR 15 WEEKS

INSTRUCTORS:	Philip Johnson	**PHONE:**	Phil: 539-2863
	Shauna Henley		Shauna: 539-2439
OFFICE:	Phil: J224	**E-MAIL:**	PJohnson@gprc.ab.ca
	Shauna: J215		SHenley@gprc.ab.ca
	Phil: Tuesday 10:00 – 11:20 & 13:00 – 14:20		
	Thursday 10:00 – 11:20; Friday 11:30 – 12:50		
OFFICE HOURS:	Shauna: TBA		

CALENDAR DESCRIPTION: All life functions are based on cells, and this course will provide an introduction to cell structure and function. Major topics will include the origin of life, the development of prokaryotic and eukaryotic cell lineage, energy conversions, the compartmentalization of biochemical functions within a cell and communication from cell to cell. The genetic control of cell activities is examined through methods of molecular genetic analysis and their application in genetic engineering and biotechnology.

PREREQUISITE(S)/COREQUISITE: Biology 30 and Chemistry 30

REQUIRED TEXT/RESOURCE MATERIALS:

1. "Biology" by Campbell *et al.* (1st (2014) or 2nd (2018) Canadian Edition), Benjamin Cummings Publishing Company.
2. "Biology on the cutting edge" edited by Gillies & Hewitt (2011), Pearson Canada Publishing Company.
3. University of Alberta, Biology 1070 Laboratory Manual 2017/18.

DELIVERY MODE(S):
Lectures – Tues and Thurs, 8:30 – 9:50, Rm J201
Labs – L1 Tues, 2:30 – 5:20, Rm J126
L2 Wed, 2:30 – 5:20, Rm J126
Seminars – S2 Mon, 11:30 – 12:20, Rm J229
S1 Fri, 10:00 – 10:50, Rm H211

COURSE OBJECTIVES:
Upon completion of the course, students should be able to:

1. Apply knowledge of the structure of molecules and cells to explain how energy, matter, and information moves within and between cells of eukaryotes and prokaryotes.
2. Apply knowledge of laboratory skills and techniques to generate data and conduct analyses of that data.
3. Demonstrate written communication skills in laboratory reports and seminars.

LEARNING OUTCOMES:

1. To gain an understanding of the structures and functions of basic components of prokaryotic and eukaryotic cells.
2. To gain a knowledge of the cellular components underlying cell movement and cell division.
3. To understand the flow of energy and information in cells and apply this knowledge to cell biology.
4. To develop the ability to design, analyze and report the findings of scientific experiments.
5. To foster critical thinking skills.

TRANSFERABILITY: UA, UC, UL, AU, CUC, KUC, GMU
***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.transferalberta.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 – 20%
Final exam – 35%
Laboratory – 35%
Seminar – 10%

The midterm exam will be held in class on approximately halfway through the semester. The final exam will be cumulative and will take place during the scheduled exam period. Failure to write the midterm or exam will result in a grade of zero unless appropriate 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)	
		1st Canadian edition	2nd Canadian edition
1.	Introduction to BI 1070		
2.	Chemistry Review	35-46, 64-96	32-45, 63-95
3.	Classification of Organisms	12-14, 589-591, 606-613	11-12, 598-600, 614-622
4.	Cell Membranes	135-149	136-151
5.	Prokaryotic Cell Structure	595-599	603-613
6.	Cell structure – Organelles	108-122	108-122
7.	Cytoskeleton and Molecular Motors	123-128	123-129
8.	Cell walls and Extracellular Matrix	128-131	129-132
9.	Biological Order and Energy	152-170	154-172
10.	Glycolysis & Anaerobic Metabolism	173-180, 188-190	175-182, 191-193
11.	Citric Acid Cycle (Kreb's Cycle)	181-182	182-185
12.	Electron Transport Systems	183-188	185-191
13.	Chloroplasts and Photosynthesis	196-206	198-208
14.	Photosynthesis - Light Reactions	206-210	208-212
15.	Calvin Cycle and Photorespiration	210-216	212-218
16.	Bacterial Cell Growth	251-252, 599-603	251-252, 606-612
17.	Cell Division, Mitosis, Meiosis	243-251, 253-259, 268-276	243-251, 253-260 268-278
18.	DNA Chemistry	328-334	329-335
19.	The Eukaryotic Nucleus	344-346	345-348
20.	DNA Replication	334-344	335-345
21.	Genes, mRNA and Proteins	349-356	351-358
22.	Transcription and RNA Processing	356-361	358-363
23.	Regulation of Transcription	377-390	380-394
24.	Translation	361-370	363-376
25.	Viruses, Phages, Viroids, and Prions	409-424	414-431

STUDENT RESPONSIBILITIES: Students are expected to attend **all** classes, seminars and laboratory sessions. 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 http://www.gprc.ab.ca/about/administration/policies/

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