BIOCHEMISTRY 401
Gene Expression in Eukaryotes
Course Outline: Spring 2019

LOCATION & TIME: ELL 060, MR 10:00-11:20 am

INSTRUCTORS: **Dr. Caren Helbing**
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TOPICS:
Biochemistry 401 is an advanced study of gene expression in eukaryotes. Topics include gene structure, eukaryotic transcription, transcriptional regulation and post-transcriptional processing with special emphasis on transcription factors and RNA dynamics with a discussion of the current literature highlighting the role of gene expression in disease and development.

PART 1: Dr. Helbing, January 7 – February 14

Date	Topic
Jan 7	Challenges in scientific thinking and communication
10	RNA polymerase complex and transcription factors
14	Cis-regulatory elements **Lay summary draft due (5%)**
17	Nuclear hormone receptors
21	Transcription factor assays
24	Transcript detection approaches **Lay summary due (10%)**
28	Chromatin features affecting gene expression
31	Technique synthesis and scientific paper discussion
Feb 4	Group work session 1 (**mandatory attendance**)
7	Group work session 2 (**mandatory attendance**)
11	**Test (20%)**
14	Group work session 3 (**mandatory attendance**) **Group critique and peer evaluation due on Monday, Feb. 25 (15%)**
18-22	**Reading Break**

Lay summary of a scientific paper:
Students are required to submit a 2 page (double spaced, 1 inch margins, 12 point font, no condensed type) lay summary of an assigned research paper.

Test:
Students are responsible for both lecture material and assigned readings for the test (worth 20% of the final grade). It will be held during class time.

Group Scientific Paper Critique Assignment:
Students must submit one written critique of a scientific paper as part of a group work assignment. This critique will be no more than 10 pages (double spaced, 12 point font, 1 inch margins).

The written critique is worth 10% of the final grade and 5% of the final grade will be a participation mark related to the preparation of this critique allocated by a confidential peer review process. The choice of scientific paper will be made by the instructor and details about expectations will be given in class.

Students are **required to participate in three in-class discussion sessions** that will take place during regular class time.

To ensure fair participation, two mechanisms will be in place:
1. Attendance will be taken for each discussion group in each session. Failure to attend a discussion group session without prior notification and approval by the instructor or a medical note will result in an automatic 2 point reduction in the final grade for each session missed.
2. The participation mark will be an average of confidential peer evaluations to be handed in by the indicated date and includes both discussion and report preparation involvement. Failure to hand in the peer evaluations will result in a mark of zero for your participation component of the grade.

Required reading:
There is no formal text for part 1 of the course. Students will be responsible for selected readings that will be announced in class. Links to the readings will be available on CourseSpaces.

PART 2: Dr. Romaniuk, February 25 – April 4

Lectures:
Topics to be discussed in the lectures are shown in the table below. The first lecture on February 25 will consist of an overview of the second half of the course followed by an introduction to the role of the C-terminal domain of RNA polymerase II in coordinating transcription and RNA processing. Subsequent lectures will consist of (a) a 10 minute multiple choice test (10 questions) on the reading assignment of one recent research paper; (b) a 30 minute in-class discussion of the assigned paper followed by a short 5 minute break; (c) a 30 minute overview of the topic of the next lecture's reading assignment (e.g. on Feb 28, this overview will cover pre-mRNA splicing and on Mar 4 we will discuss a recent paper on pre-mRNA splicing).

Date	Topic	Remarks
Feb 25	Coordinating Transcription and RNA processing	
28	Pre-mRNA splicing	Reading assignment
Mar 4	Alternative splicing	Reading assignment
7	Aberrant splicing and disease	Reading assignment
11	mRNA export/splicing	Reading assignment
14	Group Assignment 1 - splicing	
18	Nuclear RNA turnover	Reading assignment
21	Post transcriptional gene regulation	Reading assignment
25	Small RNAs	Reading assignment
28	Protein biosynthesis and translational regulation	Reading assignment
Apr 1	Group Assignment 2 - Translational regulation	
Apr 4	Class test (15%)	

Required reading:
Citations to review articles and papers for reading assignments will be available on CourseSpaces. Students will need to find the papers on-line and download the articles. All suggested papers are from journals that are subscribed to by UVic.

Evaluation:
There will be 8 multiple choice tests on the reading assignments; the average of your test results will contribute 15% to your final mark. Each multiple choice test will consist of 10 questions that test simple comprehension of the goals and outcomes reported in the papers. A more complete discussion of the papers will follow the test in each class. There will be two in class group assignments; you will be asked to read a paper in class and as a group answer 4-5 written questions about the paper. Each group assignment will contribute 10% to your final mark. There will be a take home class test due on April 4th related to one or two of the reading assignments that will contribute 15% to your final mark.

FINAL EXAM

There is no final exam in the course.

UVic Grading Scheme

A+	90 -100	**B+**	77 - 79	**C+**	65 - 69	**F**	< 50
A	85 - 89	**B**	73 - 76	**C**	60 - 64	**N ****	< 50
A-	80 - 84	**B-**	70 - 72	**D**	50 - 59		

** N grades

Students who have completed the following elements will be considered to have completed the course and will be assigned a final grade:

- *Lay summary*
- *Test from first half of the course*
- *Group critique from first half of the course*
- *At least 6 of the 8 multiple choice tests in the second half of the course*
- *Both in-class group assignments from the second half of the course*
- *Test from the second half of the course*

Failure to complete one or more of these elements will result in a grade of "N" regardless of the cumulative percentage on other elements of the course. An N is a failing grade, and it factors into a student's GPA as 0. The maximum percentage that can accompany an N on a student's transcript is 49.

DEPARTMENT INFORMATION AND POLICIES

1. The Department of Biochemistry and Microbiology upholds and enforces the University's policies on academic integrity. These policies are described in the current University Calendar. All students are advised to read this section.
2. Cell phones, computers, and other electronic devices must be turned off at all times unless being used for a purpose relevant to the class. Students having a cell phone, tablet, or computer on their person during

an exam will be assumed to have it for the purpose of cheating.

3. Any recordings of lectures may only be performed with written permission of the instructor, and are for personal use only. The instructor retains copyright to such recordings and all lecture materials provided for the class (electronic and otherwise); these materials must not be shared or reposted on the Internet.

4. Course materials, such as notes, problem sheets, quizzes, examinations, example sheets, or review sheets, may not be redistributed without the explicit written permission of the instructor.

5. Students are expected to be present for the midterm and final exams. Instructors may grant deferrals for midterm examinations for illness, accident, or family affliction, and students must provide appropriate documentation 48 hours after the midterm exam. The Department of Biochemistry and Microbiology considers it a breach of academic integrity for a student taking a deferred examination to discuss the exam with classmates. Similarly, students who reveal the contents of an examination to students taking a deferred examination are considered to be in violation of the University of Victoria policy on academic integrity (see current University Calendar). Deferral of a final exam must be requested with an Academic Concession form and submitted directly to Undergraduate Records. Deferred final exams for fall term courses will be arranged by the instructor. Deferred final exams for spring term courses will be arranged through Undergraduate Records and must be written before the end of the summer term as stipulated in the University Calendar.

6. Multiple choice scan sheets for machine scoring (bubble sheets) are considered the authentic exam answer paper and will be retained by the department for 1 year.

7. Professors may refuse to review/remark exams not written in indelible ink. In addition, requests for review/remark of a midterm exam must be made within one week of the exam being returned. Students are expected to promptly pick up midterm exams after marking has been completed, either in class or from the instructor.

8. Examination papers that have pages removed, or are mutilated will not be marked.

9. The instructor reserves the right to use plagiarism detection software or other platforms to assess the integrity of student work."

Centre for Accessible Learning

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, approach the Centre for Accessible Learning (CAL) as soon as possible in order to assess your specific needs.
https://www.uvic.ca/services/cal/index.php

Course Experience Survey (CES)

We value your feedback on this course. Towards the end of term you will have the opportunity to complete a confidential course experience survey (CES) regarding your learning experience. The survey is vital to providing feedback to us regarding the course and our teaching, as well as to help the department improve the overall program for students in the future. When it is time for you to complete the survey, you will receive an email inviting you to do so. If you do not receive an email invitation, you can go directly to your CES dashboard. You will need to use your UVic NetLink ID to access the survey, which can be done on your laptop, tablet or mobile device. We will remind you nearer the time but please be thinking about this important activity.