BIOCHEMISTRY 401
Gene Expression in Eukaryotes
Course Outline: Spring 2016

LOCATION & TIME: ECS 104, 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.

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 Resource Centre for Students with a Disability (RCSD) as soon as possible (http://rcsd.uvic.ca/.) in order to assess your specific needs.

PART 1: Dr. Helbing, January 4 – February 18

Date	Topic
Jan 4	Challenges in scientific thinking
7	Characteristics of a gene and its regulation - a contemporary view
11	Transcription factors and RNA polymerase complex
14	Cis-regulatory elements
18	Epigenetic regulation
21	Nuclear hormone receptors **Lay summary due (15%)**
25	Transcript detection - individual and systems approaches
28	Transcription factor regulation
Feb 1	**Test (20%)**
4	Group work session 1 (mandatory attendance)
8-12	**Reading Break**
15	Group work session 2 (mandatory attendance)
18	Group work session 3 (mandatory attendance) **Group critique and peer evaluation due before midnight on Monday, February 22 (15%)**

Lay summary of a scientific paper:
Students are required to submit a 2 page (double spaced, 2.5 cm margins, 12 point font, no

condensed type) lay summary of one research paper chosen from among the papers in the critique folder for the course (worth 15% of the final grade). The lay summary is due **Thursday, January 21**.

Test:
Students are responsible for both lecture material and assigned readings for the test (worth 20% of the final grade). It will be held on **Monday, February 1** 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) that is **due on Monday, February 22 before midnight**.

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 **must participate in three consecutive, in-class discussion sessions** that will take place during regular class time on **February 11, 15 and 18.**

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 submitted through CourseSpaces before **midnight on Monday, February 22** 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 22 – April 4

Lectures:
Topics to be discussed in the lectures are shown in the table below. The first lecture on February 22nd will consist of an overview of the first 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 25, this overview will cover pre-mRNA splicing and on Feb 29 we will discuss a recent paper on pre-mRNA splicing).

Date	Topic	Remarks
Feb 22	Coordinating Transcription and RNA processing	
25	Pre-mRNA splicing	Reading assignment 2%
29	Alternative splicing	Reading assignment 2%
Mar 3	Aberrant splicing and disease	Reading assignment 2%
7	mRNA export/splicing	Reading assignment 2%
10	Nuclear RNA turnover	Reading assignment 2%
14	Post transcriptional gene regulation	Reading assignment 2%

17	Small RNAs	Reading assignment 2%
21	Subcellular localization	Reading assignment 2%
24	Protein biosynthesis and translational regulation	Reading assignment 2%
31	Translational regulation	Reading assignment 2%
Apr 4	Discussion of mock exam questions	
TBD	**Exam covering Part 2 (2 hours)**	

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:
In total there will be 10 multiple choice tests on the reading assignments, each contributing 2% to the final mark. Each multiple choice test will consist of 10 questions in total intended to 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 a two hour exam scheduled during the final exam period that contributes 30% to the final mark. The exam questions will stress problem solving rather than rote memory recall. A mock test with previous exam questions will be distributed on March 31st for students to simulate the exam from a question and time constraint perspective. We will spend the last class period reviewing the questions and answers to this mock test.

FINAL EXAM

There will a final exam on Dr. Romaniuk's material worth 30% of your final grade during the regular final exam period

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 from part 1 of the course*
- *Test from part 1 of the course*
- *Group critique from part 1 of the course*
- *At least 5 of the 10 multiple choice tests from part 2 of the course*
- *Exam covering part 2 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. We reserve the right to use plagiarism detection software or other platforms to assess the integrity of student work.

Course Experience Survey (CES)

We value your feedback on this course. Towards the end of term, as in all other courses at UVic, you will have the opportunity to complete a confidential survey regarding your learning experience (CES). 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. Please ensure that your current email address is listed in MyPage (http://uvic.ca/mypage). If you do not receive an email invitation, you can go directly to http://ces.uvic.ca . 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 and provide you with more detailed information nearer the time but please be thinking about this important activity during the course.