

BIOCHEMISTRY 401
Gene Expression in Eukaryotes
Course Outline: Spring 2015

LOCATION & TIME: ECS 108, MR 10:00-11:20 am

INSTRUCTORS: **Dr. Paul Romaniuk**

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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. Romaniuk, January 5 – February 19

Lectures:

Topics to be discussed in the lectures are shown in the table below. The first lecture on January 5th 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 Jan 5th, this overview will cover pre-mRNA splicing and on Jan 8th we will discuss a recent paper on pre-mRNA splicing).

Date	Topic	Remarks
Jan 5	Coordinating Transcription and RNA processing	
8	Pre-mRNA splicing	Reading assignment 2%
12	Alternative splicing	Reading assignment 2%
15	Aberrant splicing and disease	Reading assignment 2%
19	mRNA export/splicing	Reading assignment 2%
22	Test on Jan 5 – Jan 19 material	Class Test 17%
26	Nuclear RNA turnover	Reading assignment 2%
29	Post transcriptional gene regulation	Reading assignment 2%
Feb 2	Small RNAs	Reading assignment 2%
5	Subcellular localization	Reading assignment 2%
16	Protein biosynthesis and translational regulation	
19	Test on Jan 26 – Feb 16 material	Class Test 17%

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 8 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. In addition there will be two 75 minute class tests (Jan 22, Feb 19) on the material discussed in this half of the course. These tests will stress problem solving rather than rote memory recall. Each class test will contribute 17% to the final mark.

PART 2: Dr. Helbing, February 23 – April 2

Date	Topic
Feb 23	Challenges in scientific thinking
26	Characteristics of a gene and its regulation - a contemporary view
Mar 2	Transcription factors and RNA polymerase complex
5	Cis-regulatory elements
9	Epigenetic regulation
12	Nuclear hormone receptors Lay summary due (15%)
16	Transcript detection - individual and systems approaches
19	Transcription factor regulation
23	Test (20%)
26	Group work session 1
30	Group work session 2
Apr 2	Group work session 3 Group critique and peer evaluation due by 4 pm (15%)

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 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, March 12**.

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, March 23** 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 Thursday, April 2 by 4 pm**.

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 consecutive, in-class discussion sessions** that will take place during regular class time on **March 26, 30 and April 2**.

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.

- The participation mark will be an average of confidential peer evaluations to be handed in on **Thursday, April 2** 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 2 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.

FINAL EXAM

There will not be a final exam in this 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:

- *All three class tests scheduled for Jan 21, Feb 7 and Mar 21*
- *At least 4 of the 8 multiple choice tests scheduled between Jan 8 and Feb 5*
- *Lay summary due on Mar 12*
- *Test Mar 23*
- *Group critique and peer evaluation due Apr 2*

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

- The Department of Biochemistry and Microbiology upholds and enforces the University’s policies on plagiarism and cheating. These policies are described in the current University Calendar. All students are advised to read this section.
- 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.
- 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. 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.
5. Scan sheets for multiple choice exams (bubble sheets) will not be made available for review. Therefore, in addition to filling in answers on the scan sheet, students should also circle their answers in ink on their exam.
6. Professors may refuse to review/remark exams not written in 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.
7. Examination papers that have pages removed, or are mutilated will not be marked.

January, 2015