

BIOCHEMISTRY 408 – Epigenetic Regulation of Chromatin
Course Outline: Spring 2015

Place: ECS 104
Time: Tuesday, Wednesday, Friday: 8:30 am - 9:20 am
Textbook: None
Website: CourseSpaces

Instructors: **Dr. Juan Ausió (Jan 6-9 Mar 3- Apr 1),** Office: Petch 260;
Email: jausio@uvic.ca Office hours: 9:00am-5:00pm *

Dr. Chris Nelson (Jan 13 – Feb 25) Office: Petch 270b;
Email: cjn@uvic.ca Office hours: W 1:30-3:30pm *
(or by appointment)

* No office hours will be offered the day before an exam.

Course Description: BIOC 408 introduces students to the properties of chromatin and molecular mechanisms underlying epigenetic inheritance. The course is heavily focused on primary research papers that utilize a diversity of model organisms to demonstrate the contributions of epigenetics to development and disease. The course requires a familiarization with nucleic acid and protein chemistry; therefore, students should be familiar with the fundamental aspects of transcription and gene structure. Students should also review basic cell biology in preparation for this course. Students must complete BIOC 300B before taking BIOC 408.

Format: The course will consist of formal lectures that will introduce background material and key concepts, while highlighting experimental methods. In addition, eight group discussions will take place during the course. During these meetings, students will discuss an assigned research paper in small groups prior to a short in-class quiz. The papers and the group composition will be announced at the beginning of the course.

Marking Policy: There will be two exams, two hours each. The first, covering material from Jan 6th to Feb 20th will be held on Feb 27th in the evening (6 – 8pm ECS 104). It is worth 35% of the final grade, and there will be no lecture on this date. The second exam, covering material from Feb 25th to April 4th, will be held during the final exam period and is worth 35% of the final grade. The exams will cover the material taught during the class but may involve the knowledge of some of the concepts discussed in the quizzes. Students are expected to thoroughly read assigned papers **BEFORE** the discussion groups. Performance on quizzes will comprise the remaining 30% of the final grade. The mark breakdown is thus as follows:

Nelson/Ausió Exam	35
Weekly Quizzes	30
Ausió/Nelson Final	35
TOTAL	100

Lecture Content: Each lecture will conform approximately to the attached course outline, however some changes are possible. Additional material and examples may be added by the lecturer and will be posted on Moodle.

Chromatin & Epigenetics Course Outline:

Week	Instructor	Date	Topic
1	Ausio	Jan. 6	The basic structural proteins of chromatin
1	Ausio	7	Histones
1	Ausio	9	Histone post-translational modifications
2	Nelson	13	Introduction to Epigenetics
2	Nelson	14	The stochastic nature of heterochromatin
2	Nelson	16	Histone modifications of euchromatin I
3	Nelson	20	Group Discussions & Quiz 5- Sperling and Grunstein paper
3	Nelson	21	Histone modifications of euchromatin II
3	Nelson	23	Histone modifications of heterochromatin
4	Nelson	27	Group Discussions & Quiz 6- Du et al paper
4	Nelson	28	Polycomb and Trithorax group proteins
4	Nelson	30	DNA methylation I
5	Nelson	Feb.3	Group Discussions & Quiz 7 - Margueron et al paper
5	Nelson	4	DNA methylation II
5	Nelson	6	DNA methylation and cancer
		Feb9-13	Reading Break
6	Nelson	17	Imprinting
6	Nelson	18	Environment-Epigenome interactions and human health I
6	Nelson	20	Group Discussions & Quiz 8 -Mikkelsen paper
7	Nelson	24	Environment-Epigenome interactions and human health II
7	Nelson	25	Environment-Epigenome interactions and human health III
7	Nelson	27	Exam 1 (35%)
8	Ausio	Mar. 3	Histone structure and interactions
8	Ausio	4	Nonhistone chromosomal proteins
8	Ausio	6	The nucleosome
9	Ausio	10	Group Discussions & Quiz 1- Histone variant H2AvD
9	Ausio	11	The structure of the nucleosome (1)
9	Ausio	13	The structure of the nucleosome (2)
10	Ausio	17	Group Discussions & Quiz 2- Crystal structure of the nucleosome
10	Ausio	18	The chromatin fiber (1)
10	Ausio	20	The chromatin fiber (2)
11	Ausio	24	Group Discussions & Quiz 3- The language of histone PTMs
11	Ausio	25	The chromatin fiber (3)
11	Ausio	27	The fundamental characteristics of transcriptionally active chromatin
12	Ausio	31	Group Discussions & Quiz 4- Chromatin and transcription
12	Ausio	Apr. 1	The basic structural organization of interphasic and metaphasic chromatin
12			
		TBA	Exam 2 (35%)

Conversion of Marks to Final Letter Grades: Total marks from exams and assignments will be calculated, weighted and converted to a percentage and letter grade as follows:

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:

The course will not be considered completed unless that all the quizzes, midterm and final exams have been taken.

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. 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.

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 an anonymous 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. The survey is accessed via MyPage and 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.