BIOCHEMISTRY 408 – Chromatin & Epigenetics
Course Outline: **Spring 2014**

Place: **ECS 104**
Time: Tuesday, Wednesday, Friday: 8:30 am - 9:20 am
Textbook: None
Web site: Moodle

Instructors: **Dr. Juan Ausió (Jan 7 – Feb 21)**, Office: Petch 260;
Email: jausio@uvic.ca Office hours: 9:00am-5:00pm *

Dr. Chris Nelson (Feb 25 – April 4) 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 the will be announced at the beginning of the course. A take home assignment worth 10% of the final grade is due on the last day of class.

Marking Policy: There will be two exams, each. The first, covering material from Jan 7th to Feb 19th will be held on Feb 21st outside of regular class time. 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 25% of the final grade. 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:

Ausio Exam	35
Weekly Quizzes	30
Nelson assignment	10
Nelson Final	25
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. Students are responsible for the lecture material and reading assignments for the class tests and final examination.

Chromatin & Epigenetics Course Outline:

Week	Instructor	Date	Topic
1	Ausio	Jan. 7	The basic structural proteins of chromatin
1	Ausio	8	Histones
1	Ausio	10	Histone post-translational modifications
2	Ausio	14	Histone structure and interactions
2	Ausio	15	Nonhistone chromosomal proteins
2	Ausio	17	**Group Discussions & Quiz 1- Histone variant H2AvD**
3	Ausio	21	The nucleosome
3	Ausio	22	The structure of the nucleosome (1)
3	Ausio	24	**Group Discussions & Quiz 2- Crystal structure of the nucleosome**
4	Ausio	28	The structure of the nucleosome (2)
4	Ausio	29	The chromatin fiber (1)
4	Ausio	31	**Group Discussions & Quiz 3- The language of histone PTMs**
5	Ausio	Feb. 4	The chromatin fiber (2)
5	Ausio	5	The chromatin fiber (3)
5	Ausio	7	**Group Discussions & Quiz 4- Chromatin and transcription**
		Feb10-14	**Reading Break**
6	Ausio	18	The basic structural organization of interphasic and metaphasic chromatin
6	Ausio	19	The fundamental characteristics of transcriptionally active chromatin
6	Ausio	21	**Exam for Ausio Section (35%)**
7	Nelson	25	Introduction to Epigenetics
7	Nelson	26	The stochasitc nature of heterochromatin
7	Nelson	28	Histone modifications of euchromatin I
8	Nelson	Mar. 4	**Group Discussions & Quiz 5- Sperling and Grunstein paper**
8	Nelson	5	Histone modifications of euchromatin II
8	Nelson	7	Histone modifications of heterochromatin
9	Nelson	11	**Group Discussions & Quiz 6- Du et al paper**
9	Nelson	12	Polycomb and Trithorax group proteins
9	Nelson	14	DNA methylation I
10	Nelson	18	**Group Discussions & Quiz 7 - Margueron et al paper**
10	Nelson	19	DNA methylation II
10	Nelson	21	DNA methylation and cancer
11	Nelson	25	Imprinting
11	Nelson	26	Environment-Epigenome interactions and human health I
11	Nelson	28	**Group Discussions & Quiz 8 -Mikkelsen paper**
12	Nelson	Apr. 1	Environment-Epigenome interactions and human health II
12	Nelson	2	Environment-Epigenome interactions and human health III
12	Nelson	4	Environment-Epigenome interactions and human health IV
		4	Nelson take home assignment due (10%)
		TBA	**Exam for Nelson Section (25%)**

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:

Grades	Grade Point Value	Percentage	Description
A+ A A-	9 8 7	90 – 100 85 – 89 80 – 84	**Exceptional**, **outstanding** and **excellent** performance. Normally achieved by a minority of students. These grades indicate a student who is self-initiating, exceeds expectation and has an insightful grasp of the subject matter.
B+ B B-	6 5 4	77 – 79 73 – 76 70 – 72	**Very good**, **good** and **solid** performance. Normally achieved by the largest number of students. These grades indicate a good grasp of the subject matter or excellent grasp in one area balanced with satisfactory grasp in the other area.
C+ C	3 2	65 – 69 60 – 64	**Satisfactory**, or **minimally satisfactory**. These grades indicate a satisfactory performance and knowledge of the subject matter.
D	1	50 – 59	**Marginal** Performance. A student receiving this grade demonstrated a superficial grasp of the subject matter.
F	0	0-49	**Unsatisfactory** performance. Wrote final examination and completed course requirements; no supplemental.
N	0	0-49	Did not write examination or complete course requirements by the end of term or session; no supplemental. Failure to complete one or more components of student evaluation 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 O. 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.