

## Molecular Foundations of Gene Expression

### Chem 657

**Instructor:** Thomas Kuhn, 474-5752, [tbkuhn@alaska.edu](mailto:tbkuhn@alaska.edu)  
Department of Chemistry and Biochemistry  
Reichardt Building Room 184

**Office Hours:** after lecture (1h) or arrange meeting time (email, phone)

**Lecture:** Tuesdays, Thursdays, 11:45 am – 1:15 pm, REIC 203  
(bring your lunch!!!)

**Text:** Review articles and primary research literature  
Epigenetics, C. David Allis et al., 1<sup>st</sup> Ed, 2007  
Cold Spring Harbor Laboratory Press  
**ISBN-10:** 0879698756

#### Course:

This 3 credit course focuses on the molecular interactions and regulatory processes necessary for productive gene expression in the context of development and disease. Major topics include the initiation of RNA synthesis and its major players (RNA polymerases transcription factors, enhanceosome concept) and the fundamental importance of chromatin remodeling as the heart of the epigenetic regulation of gene expression.

#### Course Goals:

- Structure-function relations of protein-protein and protein-nucleic acid interactions
- Develop an understanding of the biochemical complexity underlying gene expression
- Chromatin remodeling and gene expression
- Histone modification and gene expression regulation

#### Learning Outcomes

- Concepts of synergism, cooperativity, and reciprocity
- Epigenetics and its impact on human development, health, and disease progression
- Apply concepts to interpret experimental data
- Propose meaningful experimental approaches and formulate hypotheses.
- Critical understanding of current research areas and problems

**Instructional Methods:**

Course material is exclusively composed of review articles and primary research literature pertinent to the topics. The suggested textbook serves as a basic reference. The course is composed of class discussion (approx. 50%), individual/group presentations (approx 30%), and lectures (20%) solely to introduce topics. Hence preparation and reading of material is critical.

**Blackboard** will be utilized as a central communication platform for announcements, posting of lectures and reading material, and distribution/collection of exams. It is assumed that every student is frequently visiting blackboard to check for announcements as well as email notifications.

**Course Policies:**

*Attendance:* Regular student attendance is expected to ensure consistency in discussions and presentations. Active student participation is essential and will be accounted for in the final grade.

*Exams:* Two exams will be given, one midterm and one final exam (50 % of final grade). These exams will be a combination of essay questions or topic reviews. Makeup exams will only be allowed with pre-approval of the instructor or with an acceptable, documented reason such as unexpected illness, family emergencies or other unavoidable events.

*Presentations:* Students will receive adequate preparation time for all assignments. Content and organization of topics are the primary concern, however presentation and discussion are also subject to score (scoring sheet).

*Essays:* discussion/presentation topics will be summarized as short essays occasionally further guided by questions. Sufficient time for writing will be provided..

**Grading:**

Students will be evaluated in four basic areas: *participation in class*, written assignments, oral assignments, and knowledge (exams).

Exams (Midterm, Final):	50% (25% each)
Participation:	20%
Written assignments:	15%
Oral Assignments:	15%

- Participation will be calculated based on an average score, which includes material read (10%), understanding of methodology (20%), ability to answer questions directly related to text (50%), ability to answer questions applying learned knowledge (20%)

Written and oral assignment(s) will be scored as follows (detailed scoring sheets will be provided after completion of assignments):

Content:	30%
Organization:	30%
Presentation:	25%
Quality of Discussion:	15%

<b>Grade:</b>	<b>Percentage:</b>
A+	97-100
A	90-96
A-	88-89
B+	86-87
B	80-85
B-	78-79
C+	76-77
C	70-75
C-	68-69
D+	66-67
D	60-65
D-	58-59
F	0-57

**Ethical Considerations:**

The Chemistry Department's policy of cheating is as follows: *"any student caught cheating will be assigned a course grade of F. The student's academic advisor will be notified of this failing grade and the student will not be allowed to drop the course"*.

**Plagiarism Policy:**

Plagiarism is defined as the use of "other" intellectual property without proper reference to the original author. Intellectual property includes all electronic, spoken or print media ***thus any information taken of the web is included under this statement***. Students are expected to cite all sources used in oral and written presentations. Cases of plagiarism will be taken seriously with a grade 0 for the particular assignment. Severe cases may be referred to the Department Chair or Dean or class failing considered.

**Services –Support, Disabilities:**

Support services will be provided by the University of Alaska Library system, online resources and the instructor. Additional services are available through Student Support Services (<http://www.uaf.edu/sss/>) at UAF. We will work with the Office of Disabilities Services (203 WHIT, 474-7043) to provide accommodations for students with disabilities.