

MCB6317 (Molecular Biology of Gene Expression) Syllabus fall 2022

Instructors:

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Topics covered:

A-Transcriptional Regulation in Eukaryotes (Gurley)

promoter structure

Components of the Preinitiation Complex

TBP, TAFs, TFIID, TFIIB, F, E, H

Mediator

Role of pTEFb

RNA pol II pausing

Transactivators

Steroid receptors in mammals

Repressors/co-repressors

Auxin induction in plants

Non-canonical Transcriptional Regulation

B-Epigenetics (Keyhani)

Relationship to genetic disorders

DNA methylation

CpG islands

Epigenetic memory through mitosis

Polycomb

Trithorax

Non-coding RNAs (ncRNAs)

X chromosome inactivation

RNA-based mechanisms

microRNA (miRNA)

RNAi

Transposon silencing

Animals (Gurley)

Plants (Gurley)

Assessments and exercises:

A-Homework Quizzes (weekly)	25%
B-Final Exam (Nov 28-30) (retake Dec 1-3)	60%
C-Genome Engineering Project (due Nov 17)	<u>15%</u>
	100%

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Course/Section Information: MCB6317 2017-sections 1G66 (campus) and 07E8 (distance).

Course Prerequisites: undergraduate courses in molecular biology or biochemistry/molecular biology is recommended.

Textbook: none

Introduction: This course will discuss the central concepts in eukaryotic transcriptional regulation in eukaryotes (25%) and epigenetic control mechanisms (75%). In preparation for this course, you should understand basic college level introductory biology, and it is recommended to have at least one other more specialized biology course such as Microbiology, Botany, Zoology, Genetics or Biochemistry.

Learning Goals:

The goal of MCB6317 (Molecular Biology of Gene Expression) is for participants to understand the fundamentals of transcriptional control in eukaryotes and a variety of epigenetic control systems operating in higher organisms. *Students will:*

- 1-develop an appreciation of the complexity of eukaryotic transcriptional control.
- 2-acquire knowledge regarding basic principles of gene activation and repression.
- 3-become familiar with the molecular events involved in DNA methylation, histone modifications and RNA-based mechanisms of epigenetic regulation
- 4-How to extract information regarding gene and promoter structure from online bioinformatics databases.

Presentation Format: This course will be an online course offered to distance students as well as campus students. All lecture material is posted here at the Canvas website or is available at Vimeo.com. There will be 1-2 hours of recorded lecture material available each week for a total of seven weeks. Open-book Homework Quizzes will accompany the lectures.

Zoom Office hours: Fridays 3-5 (please make appointment using the Google Sheets link: https://docs.google.com/spreadsheets/d/1CuRQal-n61Vn3g_TP-f9oOP_SuAHpGLwmCi3-Es3_Aw/edit?usp=sharing)

Honor Code violations: The Exam is closed book and no outside material may be used during the exam including web-based and printed materials. Communication with persons not involved in proctoring is also prohibited during the exam. Failure to comply will result in a failing grade for the course. All HonorLock videos and screen recordings are subject to review by the instructor and teaching assistants. Each student's exam video will be reviewed by HonorLock and by a teaching assistant (or the instructor).

After a consultation with the student, a grade of zero may be assigned if Proctoring Standards are violated during the exam.

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Proctoring Standards: The test taker must use a 120° field of view external camera positioned for a side-view. The proctor must be able to see the computer screen, keyboard, both hands and surrounding desktop, and the side of the face. Additionally, the microphone must be turned on with normal volume. There should be no test-related material in view of the test taker. The exam should be taken by the student submitting the exam with no assistance by other persons.

HonorLock protocols: The Exam will be taken using HonorLock and monitored using the 120° wide-angle external webcam recommended (cost \$20-25 from Amazon). Students should access the final exam using the HonorLock Dashboard using the Chrome browser. During the External Camera Certification quiz, HonorLock will automatically install the HonorLock extension that will enter the exam access code. If you encounter technical problems during the exam or when accessing the exam, you should first contact the HonorLock Chat Box. They are very skilled at solving access and computer issues.

Final Grade Assignment Policy:

Grading Scale Numerical Equivalents	
A = 91 or above	C = 68-73.99(minimum needed for major)
A- = 89-90.99	C- = 65-67.99
B+ = 85-88.99	D+ = 62-64.99
B = 81-84.99	D = 58-61.99
B- = 79-80.99	D- = 54-57.99
C+ = 74-78.99	E = 0-53.99

UF Grading Policies:

<http://www.registrar.ufl.edu/catalog1011/policies/regulationgrades.html>

Students Requiring Accommodations

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Students with accommodations that have been approved by the UF Disability Resource Center must send copies (or scans) of the approval letter to the instructor at least 2 days before the first exam (There is only one Exam in this course.) Some accommodations present special security concerns related to the integrity of the assessment process and can only be met by taking the exam at UF-approved testing centers. Please notify the instructor as soon as possible so that the appropriate accommodations can be met.

Counseling and Wellness Center

Resources are available on campus for students having personal problems or lacking clear career and academic goals, which interfere with their academic performance.

These resources include:

1. University Counseling Center, 301 Peabody Hall, 392-1575, <http://www.counseling.ufl.edu/cwc/Default.aspx> - personal and career counseling;
2. Student Mental Health, Student Health Care Center, 392-1171, personal counseling;
3. Sexual Assault Recovery Services (SARS), Student Health Care Center, 392-1161, sexual assault counseling;
4. Career Resource Center, Reitz Union, 392-1601, www.crc.ufl.edu career development assistance and counseling.

For **emergencies** call the University of Florida Police Department: 392-1111 or 9-1-1 for emergencies.

Communication Methods for Online Students

Recommended for the syllabus of a course that delivers 80% or more of its content online is a statement that clearly outlines preferred methods for private and public communication regarding the course and for resolving technical issues the student may face.

Student Complaint Process: The following is recommended for inclusion in the syllabus to inform students on the process of filing a complaint about the course:

- *Residential Course:* https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf.
- *Online Course:* <http://www.distance.ufl.edu/student-complaint-process>.

Please review this policy to ensure that your syllabus is in compliance, and just as a reminder, your syllabus must be posted on publicly accessible UF web sites per the August 26, 2013 Memorandum available at

<https://administrativememo.ufl.edu/2013/08/posting-course-syllabi/>.

Course Evaluation

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

Class Demeanor

Research-based degree students are expected to arrive to class on time and behave in a manner that is respectful to the instructor and to fellow students. Please avoid the use of cell phones and restrict eating to outside of the classroom. Opinions held by other students should be respected in discussion, and conversations that do not contribute to the discussion should be held at minimum, if at all.

Online students may attend in person on campus, as room permits.

NETIQUETTE GUIDE FOR ONLINE COURSES

It is important to recognize that the online classroom is in fact a classroom, and certain behaviors are expected when you communicate with both your peers and your instructors. These guidelines for online behavior and interaction are known as netiquette.

<http://teach.ufl.edu/wp-content/uploads/2012/08/NetiquetteGuideforOnlineCourses.pdf>

University Honesty Policy

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (<https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Materials and Supplies Fees

There are no additional fees for this course.

Software Use

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

Microsoft Software for UF students

<http://www.software.ufl.edu/>

The Office of Information Technology has great news for University of Florida students! If you want to upgrade your operating system or need Microsoft Office Suite, this media will be available in the Spring 2011 semester. The different media available are:

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Windows 7 operating system Upgrade, Microsoft Office Professional Plus 2010 (32-bit/64-bit) for PC or Microsoft Office for Mac 2011.

Software is free for UF students.

To check for availability of the media and technical requirements, contact the UF Computing Help Desk at (352)392-HELP(4357). Once the media is available, you can get it at the UF Computing Help Desk or at the UF Bookstore.

Campus Resources Summary:

Health and Wellness

U Matter, We Care:

If you or a friend is in distress, please contact umatter@ufl.edu or 352 392- 1575 so that a team member can reach out to the student.

Counseling and Wellness Center: <http://www.counseling.ufl.edu/cwc/Default.aspx>, 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Assault Recovery Services (SARS)

Student Health Care Center, 392-1161.

University Police Department, 392-1111 (or 9-1-1 for emergencies).

<http://www.police.ufl.edu/>

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. <https://lss.at.ufl.edu/help.shtml>.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. <http://www.crc.ufl.edu/>

Library Support, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.