



DEPARTMENT OF BIOCHEMISTRY

**BCHM 61100-001 Syllabus  
Fall, 2016**

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**COURSE OBJECTIVES**

*In this course, we will discuss recent and historical key genetic and biochemical findings related to chromatin biology and how these observations have led to and shaped current models in the field. We will explore nucleosome composition, assembly and remodeling and their relationship to gene expression and DNA replication. We will discuss enzymes mediating biochemical modifications to DNA and histones. We will investigate how these modifications influence chromatin structure and function as well as gene regulation. We will explore the relationship between epigenetic processes and development, health and disease. This course will draw from examples in both model organisms and mammals and compare common themes as well as variations across organisms.*

**TEXTBOOK**

No textbook is assigned for this course. Readings, discussions and lectures will be based on selected chapters (Optional background: Epigenetics, C.D. Allis, M.-L. Caparros, T. Jenuwein, D. Reinberg, eds., CSHL Press 2015; Genes X. J.E. Krebs, E.S. Kiiilpatrick, eds., Jones & Bartlett, 2011), primary literature and reviews.

**LECTURE TIME AND PLACE**

T,Th 9:30 – 11:20 AM, BRNG 1202

**BLACKBOARD**

The syllabus for the course, lecture notes, papers, etc. will be available via the Purdue University Blackboard site at: <https://blackboard.purdue.edu/webct/logonDisplay.dowebct>

**ASSESSMENT**

Assessment of student performance will occur through monitoring participation, group discussions, quality of presentations and performance on assignments.

The grading for this course will be as follows:

Participation	100 points
Presentation	100 points
Homework	400 points

The cutoff values for letter grades are as follows:

540 points	A
480 points	B
420 points	C
360 points	D
299 points and below	F

This is a participation-based course. Missing a class=no participation and will result in a grade of 0 being recorded for that day unless documented justification for the absence documentation (doctor's note, request from academic advisor, etc.) is presented.

Requests for re-grades must be submitted no later than the end of the second class period after the graded test or assignment has been returned.

### **EXTRA CREDIT**

There will be no opportunity for extra credit.

### **OBTAINING EXTRA HELP**

Dr. Kirchmaier will be available to answer your questions immediately after class, or by appointment (arranged in class or by e-mail).

### **ACADEMIC MISCONDUCT**

Academic misconduct of any kind will not be tolerated in any course offered by the Department of Biochemistry. Information on Purdue's policies with regard to academic misconduct can be found at

[http://www.purdue.edu/studentregulations/student\\_conduct/regulations.html](http://www.purdue.edu/studentregulations/student_conduct/regulations.html)

Any incidence of academic misconduct will be reported to the Office of the Dean of Students. Academic misconduct may result in disciplinary sanctions including expulsion, suspension, probated suspension, disciplinary probation, and/or educational sanctions. In addition, such misconduct will result in punitive grading such as:

- receiving a lower or failing grade on the assignment, or
- assessing a lower or failing grade for the course

Punitive grading decisions will be made after consultation with the Office of the Dean of Students. Please note reported incidences of academic misconduct go on record for reference by other instructors. Further, a record of academic misconduct is likely to influence how current/future situations are handled.

To provide you with an unambiguous definition of academic misconduct, the following text has been excerpted from "Academic Integrity: A Guide for Students", written by Stephen Akers, Ph.D., Executive Associate Dean of Students (1995, Revised 1999, 2003), and published by the Office of the Dean of Students in cooperation with Purdue Student Government, Schleman Hall of Student Services, Room 207, 475 Stadium Mall Drive West Lafayette, IN 47907-2050.

"Purdue prohibits "dishonesty in connection with any University activity. Cheating, plagiarism, or knowingly furnishing false information to the University are examples of dishonesty." [Part 5, Section III-B-2-a, *Student Regulations*] Furthermore, the University Senate has stipulated that "the commitment of acts of cheating, lying, and deceit in any of their diverse forms (such as the use of substitutes for taking examinations, the use of illegal cribs, plagiarism, and copying during examinations) is dishonest and must not be tolerated. Moreover, knowingly to aid and abet, directly or indirectly, other parties in committing dishonest acts is in itself dishonest." [University Senate Document 72-18, December 15, 1972]

More specifically, the following are a few examples of academic dishonesty which have been discovered at Purdue University.

- substituting on an exam for another student
- substituting in a course for another student
- paying someone else to write a paper and submitting it as one's own work
- giving or receiving answers by use of signals during an exam
- copying with or without the other person's knowledge during an exam
- doing class assignments for someone else
- plagiarizing published material, class assignments, or lab reports
- turning in a paper that has been purchased from a commercial research firm or obtained from the internet
- padding items of a bibliography
- obtaining an unauthorized copy of a test in advance of its scheduled administration
- using unauthorized notes during an exam
- collaborating with other students on assignments when it is not allowed
- obtaining a test from the exam site, completing and submitting it later
- altering answers on a scored test and submitting it for a regrade
- accessing and altering grade records
- stealing class assignments from other students and submitting them as one's own
- fabricating data
- destroying or stealing the work of other students

Plagiarism is a special kind of academic dishonesty in which one person steals another person's ideas or words and falsely presents them as the plagiarist's own product. This is most likely to occur in the following ways:

- using the exact language of someone else without the use of quotation marks and without giving proper credit to the author
- presenting the sequence of ideas or arranging the material of someone else even though such is expressed in one's own words, without giving appropriate acknowledgment
- submitting a document written by someone else but representing it as one's own"

Students can report issues of academic integrity that they observe through the Office of the Dean of Students website ([www.purdue.edu/odos](http://www.purdue.edu/odos)), or 765-494-8778 or [integrity@purdue.edu](mailto:integrity@purdue.edu).

## **CLASS ATTENDANCE**

In accordance with University policy, you are expected to attend every scheduled class. If you have a valid reason for missing class such as a University-sponsored activity, religious observances, illness, or family emergency, the instructor or TA will assist you in obtaining information and materials you may have missed. Students who skip class without a valid excuse should not expect the instructor or TA to supply class notes or provide special help. For the official university policy, see:

[www.purdue.edu/odos/services/classabsence.php](http://www.purdue.edu/odos/services/classabsence.php) and  
[http://www.purdue.edu/studentregulations/regulations\\_procedures/classes.html](http://www.purdue.edu/studentregulations/regulations_procedures/classes.html)

## **EMERGENCY PREPAREDNESS**

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances. To get information about changes in this course consult the class Blackboard site or e-mail or phone the instructor.

## **ON-LINE COURSE EVALUATIONS**

During the last two weeks of the semester, you will be provided an opportunity to evaluate this course and your instructor(s). To this end, Purdue has transitioned to online course evaluations. On Monday of the fifteenth week of classes, you will receive an official email from evaluation administrators with a link to the online evaluation site. You will have two weeks to complete this evaluation. Your participation in this evaluation is an integral part of this course. Your feedback is vital to improving education at Purdue University. I strongly urge you to participate in the evaluation system.

## **NON-DISCRIMINATION POLICY STATEMENT**

Purdue University's non-discrimination policy will be upheld in this classroom. Purdue University is committed to maintaining a community which recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual to strive to reach his or her own potential. In pursuit of its goal of academic excellence, the University seeks to develop and nurture diversity. The University believes that diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life.

Purdue University views, evaluates, and treats all persons in any University related activity or circumstance in which they may be involved, solely as individuals on the basis of their own personal abilities, qualifications, and other relevant characteristics.

In this course, each voice in the classroom has something of value to contribute. Please take care to respect the different experiences, beliefs and values expressed by students and staff involved in this course. We support Purdue's commitment to diversity, and welcome individuals of all ages, backgrounds, citizenships, disability, sex, education, ethnicities, family statuses, genders, gender identities, geographical locations, languages, military experience, political views, races, religions, sexual orientations, socioeconomic statuses, and work experiences

For more information, see [http://www.purdue.edu/purdue/ea\\_eou\\_statement.html](http://www.purdue.edu/purdue/ea_eou_statement.html).

## LECTURE SCHEDULE

Date	Day		Topic
8/23	T	Kirchmaier	Introduction/Chromatin-Chromosome Overview
8/25	Th	Kirchmaier	Histone Variants
8/30	T	Student Presentation 1	Nucleosomes –Chromatin Assembly
9/1	Th	Kirchmaier	DNA Methylation/Hydroxymethylation
9/6	T	Student Presentation 2	DNA Demethylation
<b>9/6</b>	<b>T</b>	<b>Homework 1 Due</b>	<b>Bisulfite Sequencing, Detection of Hydroxymethylation, Inhibition of DNA Methylation</b>
9/8	Th	Ogas	Chromatin Remodeling
9/13	T	Student Presentation 3	Chromatin Remodeling
9/15	Th	Briggs	Histone Demethylation and Methylation
<b>9/15</b>	<b>Th</b>	<b>Homework 2 Due</b>	<b>Protein Domains that Bind Chromatin Modifications</b>
9/20	T	Student Presentation 4	Chromatin Boundaries
9/22	Th	Student Presentation 5	<i>S. pombe</i> Centromeric Heterochromatin
9/27	T	Dykhuisen	BAF Complexes
<b>9/27</b>	<b>T</b>	<b>Homework 3 Due</b>	<b>ncRNA, siRNA, miRNA</b>
9/29	Th	Student Presentation 6	ncRNAs
10/4	T	Student Presentation 7	Epigenetics: <i>S. cerevisiae</i> Silencing
<b>10/6</b>	<b>Th</b>	<b>Homework 4 Due</b>	<b>Small Molecule Inhibitors/Activators</b>
10/6	Th	Pascuzzi	Bioinformatics & Analyses of Chromatin
10/11	T	<b>No Class</b>	<b>Fall Break</b>
10/13	Th	Kirchmaier	Chromatin & Splicing
10/18	T	Kirchmaier	Epigenetics – Heterochromatin /Cancer



## EMERGENCY PREPAREDNESS SYLLABUS ATTACHMENT

**EMERGENCY NOTIFICATION PROCEDURES** are based on a simple concept – if you hear a fire alarm inside, proceed outside. If you hear a siren outside, proceed inside.

- **\_Indoor Fire Alarms** mean to stop class or research and immediately **evacuate** the building.
  - Proceed to your Emergency Assembly Area away from building doors. **Remain outside** until police, fire, or other emergency response personnel provide additional guidance or tell you it is safe to leave.
  
- **\_All Hazards Outdoor Emergency Warning Sirens** mean to immediately seek shelter (**Shelter in Place**) in a safe location within the closest building.
  - “Shelter in place” means seeking immediate shelter inside a building or University residence. This course of action may need to be taken during a tornado, a civil disturbance including a shooting or release of hazardous materials in the outside air. Once safely inside, find out more details about the emergency\*. **Remain in place** until police, fire, or other emergency response personnel provide additional guidance or tell you it is safe to leave.

*\*In both cases, you should seek additional clarifying information by all means possible...Purdue Home page, email alert, TV, radio, etc...review the Purdue Emergency Warning Notification System multi-communication layers at*

[http://www.purdue.edu/ehrs/emergency\\_preparedness/warning-system.html](http://www.purdue.edu/ehrs/emergency_preparedness/warning-system.html)

### **EMERGENCY RESPONSE PROCEDURES:**

- **\_Review the Emergency Procedures Guidelines**  
[https://www.purdue.edu/emergency\\_preparedness/flipchart/index.html](https://www.purdue.edu/emergency_preparedness/flipchart/index.html)
  - **\_Review the Building Emergency Plan** (available from the building deputy) for:
    - evacuation routes, exit points, and emergency assembly area
    - when and how to evacuate the building.
    - shelter in place procedures and locations
    - additional building specific procedures and requirements.

### **EMERGENCY PREPAREDNESS AWARENESS VIDEOS**

- **\_“Shots Fired on Campus: When Lightning Strikes,”** is a 20-minute active shooter awareness video that illustrates what to look for and how to prepare and react to this type of incident. See: <http://www.purdue.edu/securePurdue/news/2010/emergency-preparedness-shots-fired-on-campus-video.cfm> (Link is also located on the EP website)

### **MORE INFORMATION**

Reference the Emergency Preparedness web site for additional information:

[http://www.purdue.edu/emergency\\_preparedness](http://www.purdue.edu/emergency_preparedness)