

BB 492/592, Biochemistry 3

Spring 2017- 3 credits

Class Meetings

MWF 1000-1050, LINC 303

Instructor

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Teaching Assistant

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Textbook/ Learning Resources

Textbook: *Biochemistry*, Fourth Edition, by Mathews, van Holde *et al.*

Study guides and other material relevant to the class will be posted on Canvas. To access class materials, please be sure to choose BB_492_X001_S2017 from your list of courses. The class schedule and exam dates for the quarter are also posted at this site. *It is the student's responsibility to check Canvas regularly for announcements and information pertaining to the course.*

You are welcome to e-mail me with your questions or meet with me in my office if you need help. If my posted office hours conflict with your other classes, feel free to request an appointment at another time. I also encourage you to e-mail the TA with your questions or requests for review of anything that you don't understand fully. We're here to help you- so don't be shy.

Course Goals

This course will

- build on the knowledge of information transfer in cells gained in the BI 21X series and BB 314 and extend students' knowledge of how cells store and use genetic information.
- introduce students to important techniques and experimental approaches used in molecular biology.
- provide opportunities for students to read research papers and critically evaluate the results.

These course goals are linked to specific student learning outcomes.

Student Learning Outcomes

Learning outcomes indicate what students should be able to do as a result of instructional activity in BB 492/592. Outcomes are organized to match the course goals, as well as the exams and homework.

Students will:

- Understand and correctly utilize the scientific vocabulary used in communicating information in molecular biology.
- Explain the general principles of genome structure, genome evolution and gene organization in prokaryotes and eukaryotes.
- Outline how chromatin regions are generated and maintained and how epigenetic modifications control chromatin structure and gene expression.
- Describe the mechanisms by which genetic information is transmitted and used.
- Explain how gene expression is regulated at the level of transcription and translation.
- Describe the important tools and experimental approaches used in molecular biology.
- Read and critically analyze papers from the primary literature.
- Integrate and apply general concepts of molecular biology to assess specific situations/problems and propose explanations/solutions.

Evaluation (Exams and grading)

The course grade is based upon the following for BB 492 and BB 592:

Component	BB 492	BB 592
Exam 1	125 points	125 points
Exam 2	125 points	125 points
In-class work/paper analyses	60 points	60 points
Concept maps (8)	40 points	40 points
Homework (5)	50 points	50 points
Online Discussion (weekly)	50 points	50 points
Final take-home assignment	50 points	50 points
Term Paper	N/A	100 points
Total points	500 points	600 points

These components are explained below in greater detail.

Exams

All exams must be taken. Makeup exams will be given only for absences excused by the instructor. For absences that can be anticipated ahead of exam time, advance permission from the instructor to miss the exam is required. Requests for excused absences/make-up exams will be considered on a case-by-case basis and *permission is not guaranteed*. If you are presenting at a scientific meeting, or on an athletic team/marching band that is on the road on the day of the exam, it is your responsibility to provide documentation (such as a letter from a research mentor, coach, or band director indicating that your absence is unavoidable and is part of your OSU education). Excused absences will **not** be allowed for routine illness (colds, etc.), or other mild ailments. Please make sure to acquaint yourself with the exam schedule right away and make any plans accordingly. Excused absences will **not be permitted after the absence has occurred**, except under very unusual circumstances, such as serious medical emergencies documented by a doctor's letter. *There are no exceptions to this rule.*

Class participation

You will be expected to actively participate during class periods. This may involve working with other students on exercises to improve your understanding. We will also use some class time to discuss papers assigned for reading. Students are expected to come to class prepared for discussion, and may be called on to analyze specific experiments from the paper.

Concept maps

This course will make extensive use of concept maps to help students to learn the subject and integrate new information and concepts with their existing framework of knowledge. Students will make and upload to Canvas a concept map for each week's topic(s) as instructed. Maps must be completed and uploaded by the deadline to receive credit. Students will add to and modify these maps in class, to create a more detailed and nuanced depiction of the topic for the week. Students will consolidate maps at the end of the term to create a master map, as part of the take-home final assignment.

Homework

Regular homework assignments will be posted on Canvas. Assignments must be completed as described and uploaded to Canvas by the indicated deadlines to receive credit.

Participation in the online discussion forum

Students will be expected to regularly discuss the week's topics on the online discussion forum. Participation is required and graded. Suitable ways to participate in the discussion will be described on the first week's discussion board, as well as minimum levels of participation required to receive credit.

Final take-home assignment

A final take-home assignment will be provided on Canvas, to be completed and submitted by the indicated deadline.

Term Paper (BB 592 only)

The paper assignment entails a critical analysis of a *recent, full-length, primary* research publication, dealing with any topic covered this term. The appropriateness of the article should be discussed with the instructor ahead of time. The paper should take the form of a written journal club presentation, in which the student presents a clear summary and critical analysis of the paper. The following questions should be considered: Is the paper a significant contribution to knowledge? In what way? Are experimental methods clearly described? Do the authors adequately consider alternative models? Are the experiments convincing? Are the conclusions drawn justified based on the reported results? What are the most important future directions for the work? *Please make sure to substantiate your opinions by citing from the literature.* Recommended length: 5–6 pages, double-spaced. Term papers must be uploaded as pdf files to Canvas by the indicated due date.

Grades

No fixed numerical grading scale will be used to determine letter grades. Letter grades will be determined at the end of the term based on the distribution of the point totals for the class. Letter grades will **not** be assigned for each exam, but the median and average scores for the class, as well as the range will be posted, so that you may assess where you stand in the class.

Grading errors/requests for re-grading

If you think that your answer on an exam has been wrongly graded (or that the points have not been totaled correctly) you may bring it to the instructor's attention and request re-grading *within two class periods* after the day that exams are returned to the class. *After this time, no requests for re-grading will be considered.* Students are strongly advised to pick up exams in a timely manner and to go through them promptly. This will help

you to correct misconceptions quickly, enhancing your learning and will also ensure that errors, if any, in grading are fixed.

General suggestions for success in this course

If you wish to do well in this course:

Keep in mind that this is a 400-level class, and that your aim should be expand your understanding of the subject, not just in terms of the more or less "settled" facts, but also to become aware of the frontiers that are just being explored. You should also become familiar with the tools and approaches used to answer questions in the field. Participation in class discussions and analysis of research papers are required and graded, and you should be prepared for each class session, so that you can fully engage in learning and work effectively with your peers. Expect to spend significant time regularly outside of class to read and complete assignments.

Understand expectations - I will expect you to learn the facts, but also to be able to think using those facts, and apply your knowledge. This is a higher level of mastery than simple factual knowledge and requires more effort to achieve. Use all the resources provided to you - do the assigned reading, use the online resources provided, attend class, be engaged, and ask questions of your teaching assistant and instructor. *If you do not understand something, it will not miraculously become clear to you or go away if you ignore it.* Take responsibility for your learning and ask for help if you need it - we are here to help you.

Important - a word about prerequisites: We will assume that you have the basic background knowledge that you should have acquired in prior courses. For this reason, it may be helpful to regularly review related material from introductory courses in genetics or cell and molecular biology, so that you can be prepared for the topic we will be discussing next. In preparation for work in class meetings, you will need to ensure that you remember and have mentally organized your prior knowledge in a coherent manner, so that you will readily be able to link new information to an existing framework. While this requires some prep time before class, it makes your learning much more effective and meaningful.

Regular class attendance is necessary for success in this course. Please be considerate of your fellow students and your instructor and silence your cell phone or any other electronic device you possess that might disrupt the class.

General OSU and Departmental Policies

Disabilities/ Special Accommodations

Accommodations for students with disabilities are determined and approved by Disability Access Services (DAS). If you, as a student, believe you are eligible for accommodations but have not obtained approval please contact DAS immediately at 541-737-4098 or at <http://ds.oregonstate.edu>. DAS notifies students and faculty members of approved academic accommodations and coordinates implementation of those accommodations. While not required, students and faculty members are encouraged to discuss details of the implementation of individual accommodations.

Student Conduct

The Department of Biochemistry/Biophysics and the Biology Program follow the university policies on student conduct.

Student conduct is governed by the university's policies, as explained in the [Office of Student Conduct: Information and Regulations](#).

Academic Integrity

Students are expected to comply with all regulations pertaining to academic honesty. For further information, visit [Avoiding Academic Dishonesty](#), or contact the office of Student Conduct and Mediation at 541-737-3656.

OAR 576-015-0020 (2) Academic or Scholarly Dishonesty:

a) Academic or Scholarly Dishonesty is defined as an act of deception in which a Student seeks to claim credit for the work or effort of another person, or uses unauthorized materials or fabricated information in any academic work or research, either through the Student's own efforts or the efforts of another.

b) It includes:

(i) CHEATING - use or attempted use of unauthorized materials, information or study aids, or an act of deceit by which a Student attempts to misrepresent mastery of academic effort or information. This includes but is not limited to unauthorized copying or collaboration on a test or assignment, using prohibited materials and texts, any misuse of an electronic device, or using any deceptive means to gain academic credit.

(ii) FABRICATION - falsification or invention of any information including but not limited to falsifying research, inventing or exaggerating data, or listing incorrect or fictitious references.

(iii) ASSISTING - helping another commit an act of academic dishonesty. This includes but is not limited to paying or bribing someone to acquire a test or assignment, changing someone's grades or academic records, taking a test/doing an assignment for someone else by any means, including misuse of an electronic device. It is a violation of Oregon state law to create and offer to sell part or all of an educational assignment to another person (ORS 165.114).

(iv) TAMPERING - altering or interfering with evaluation instruments or documents.

(v) PLAGIARISM - representing the words or ideas of another person or presenting someone else's words, ideas, artistry or data as one's own, or using one's own previously submitted work. Plagiarism includes but is not limited to copying another person's work (including unpublished material) without appropriate referencing, presenting someone else's opinions and theories as one's own, or working jointly on a project and then submitting it as one's own.

c) Academic Dishonesty cases are handled initially by the academic units, following the process outlined in the University's Academic Dishonesty Report Form, and will also be referred to SCCS for action under these rules.

“The goal of Oregon State University is to provide students with the knowledge, skill and wisdom they need to contribute to society. Our rules are formulated to guarantee each student's freedom to learn and to protect the fundamental rights of others. People must treat each other with dignity and respect in order for scholarship to thrive. Behaviors that are disruptive to teaching and learning will not be tolerated, and will be referred to the Student Conduct Program for disciplinary action. Behaviors that create a hostile, offensive or intimidating environment based on gender, race, ethnicity, color, religion, age, disability, marital status or sexual orientation will be referred to the Affirmative Action Office.”