

BIOL 3310: Cellular and Molecular Biology

Autumn 2015 Syllabus

LECTURE: Cellular and Molecular Biology 3310 (Section 2 – Dulai)
PLACE: Classroom Building C117
TIME: TR 9:30 am - 10:45 am (75-minutes)

LMS WEB SITE: **COMPULSORY.** All students **MUST** purchase access to **MasteringBiology** web access for the course. **THE COURSE NUMBER IS: MBDULAI46433.** There is a version with an **electronic copy of the entire textbook on this web site. This is the most economical solution.**
<http://www.pearsonmylabandmastering.com/northamerica/masteringbiology/students/get-registered/index.html>

OTHER: Classroom Clickers (iClickers) are a **compulsory purchase or rental** – get these from the campus bookstore.

TEXTBOOK: **OPTIONAL HARDCOPY.** *Becker's World of the Cell*. 8th Edition. Jeff Hardin, Gregory Bertoni, and Lewis Kliensmith. (2013). Students must also purchase access to the MasteringBiology LMS web site.

INSTRUCTOR: Dr. Kamal Dulai
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Office: N 251

Office Hours: T: 10:55 am – 11:55 am.
R: 10:55 am – 11:55 am. Also by appointment

COURSE OBJECTIVES

This course will examine fundamental principles of eukaryotic cell biology at the molecular level with particular emphasis on biochemical approaches and mechanisms.

Students should leave with:

- A better understanding of the components of cells, how they work and interact, as well as our current limits of knowledge.
- Knowledge of the general classes of macromolecules that comprise the cell and explain the importance of each.
- Understanding the scientific approach to asking and answering questions experimentally.
- Comprehension of the important structures within the cell, describe their functions, and knowledge of which are present in each primary cell type.
- Describe the structure of DNA and explain how that structure is important in its self-replication and in its function, the processes of mitosis and meiosis, tell how they differ, and explain the importance of each to the passage of genetic information from one cell generation to the next.
- Describe the general classes of macromolecules that comprise the cell and explain the importance of each.
- Comprehend the need for proper exchange of information by communication between scientists.

COURSE ORGANIZATION

Cell & Molecular Biology is primarily a lecture course presented as two 75-minute lectures each week. Demonstrations will be used to illustrate particular principles, as applicable. The course content is structured to continuously build upon previously learnt material. It is strongly suggested that you keep abreast of the subject matter and study after each class as opposed to trying to 'catch up' prior to the exams. It is also recommended that students retain and consult their syllabus, visit the supporting web site, and read associated text chapters. Each exam shall be comprehensive in that it will encompass material covered up until that point from the start of the course. Questions shall appear in the form of multiple-choice, best answer, short and/or long answers. The most productive use of your time outside class would be to form a study group.

COURSE SUPPORT

A web site will provide supplemental material for all students. Links to useful resources will be provided as the course progresses. The site shall be updated each week, at the minimum, so students are encouraged to visit it on a regular basis. Handouts and instructions for completing term papers shall be provided on the Blackboard website.

POLICIES & PROCEDURES

Please carefully familiarize yourself with the policies below. It shall be assumed that you have read and understood them.

SCORES & GRADES

Course Scoring:

Assignment	Point Allocation	Total Points	% of Total Points
Exams (Midterms)	50 points each x 4	200	20%
MasteringBiology LMS (total)	400 points	400	40%
Final Exam	400 points	400	40%
	Total	1000	100%
Clicker Based Attendance Bonus Points*		50	5%

*Note: * only from clicker usage and your physical presence for the full duration of lectures.*

Letter Grades: The final distribution of grades is given below. Sorry, no exceptions shall be made!

Course Point Score	Letter Grade	Course Point Score	Letter Grade
88.00% to 100.00%	A	68.00% to 70.99%	C
85.00% to 87.99%	A-	65.00% to 67.99%	C-
81.00% to 84.99%	B+	61.00% to 64.99%	D+
78.00% to 80.99%	B	58.00% to 60.99%	D
75.00% to 77.99%	B-	55.00% to 57.99%	D-
71.00% to 74.99%	C+	0.00% to 54.99%	F

Information on grade appeals, incompletes, etc. can be found in the *CSUStan Grading Policy* available from the Registrar.

COURSE SPECIFIC POLICIES

Mid-term Exams:

Four mid-exams will be given during the indicated lecture periods. These shall consist of a mix of question formats, **including multiple choice answer questions, fill-in, short answer, and annotation**. Please bring with you a green Scantron (Form 882-E) with your name and student number correctly filled in, a pencil and your student ID. In most cases a simple calculator may also be required.

Midterm exams are **cumulative**. You are expected to be familiar with the material covered in previous assessments, and shall be tested on it. Study guides are NOT offered – as all content is important!

Final Exam:

A single two hour **cumulative** final exam will be given during the final week. The final shall consist of 100 multiple choice answer questions. **NOTE:** You may be asked specific questions on material covered by **any** component of the course; past exams, labs, discussion topics, and lectures.

BEWARE: *Note the time and place for the final may be different from the regular lecture times.*

Lecture Attendance

Students should attend all lectures. Classroom Response devices (clickers) shall be used to record attendance and participation in other activities. It is YOUR responsibility to bring your clicker to class. Attendance shall be taken automatically at the **start** of each lecture, using clickers, and bonus points shall be awarded for attendance (2 points/lecture). Please arrive on time or risk missing on this activity. No further opportunity shall be afforded to regain these points. **A maximum of 50 bonus points can be earned.** It is YOUR responsibility to bring your clicker to class. If you forget it, or lose it, then please do not ask for compensation, as it will be denied. If your clicker malfunctions, either during class or outside class, take it back to the book store immediately. Your clicker is equivalent to a calculator – if it malfunctions or the battery expires, it is your responsibility to take corrective measures!

Team-based Learning:

At the beginning of the term, students shall be surveyed. Based on the analysis of this data, each student shall be placed in a team, whose members shall sit together, discuss and work solutions, and provide consensus graded answers to select questions for the remainder of the semester. Each team shall comprise six members. It is imperative that you learn to cooperate in a positive manner with other team members. Learn to identify strengths in others and yourselves and use these to your advantage.

Bonus Points

During the semester occasions **may** arise where the teaching staff may offer the entire class an opportunity to makeup missed points on select portions of exams by completing homework assignments. These points shall be added to that examination grade, as appropriate. This activity, the number of bonus points, and periodicity is at the sole discretion of the course instructor.

Independent Study Groups

Although not mandatory, students are **strongly** encouraged to form large (6-15) member study groups, which should meet outside official course hours to tackle course material. Based on data from previous years, these study groups have provided an 18 point advantage on average. You are encouraged to meet with the lecturer early in the course and discuss your learning methodology.

Make-up exams will not be offered for any midterm assessments.

No make-up mid-term exams are offered under any circumstances. Students who miss a midterm will receive a zero for the entire exercise unless they provide documentation, within 7 days of their return, for **one of the following** acceptable excuses:

1. Incapacitating illness or accident -- requires a note from student's physician (not a family member) or from UC Merced Health Services.
2. Death or serious illness of an immediate family member—requires proper documentation.
3. State or federally accepted religious observance or an academic activity (you will be sent to the Office of Student Life to supply proof). This also has to be acceptable to the instructor of record, and you must present your case well ahead of time.

Students with a **documented excuse** (only as above) shall receive a provisional grade on the midterm report based on the average of their other completed mid-term scores. Appropriate official written proof must be supplied in all cases to the instructor, either prior to the event or in any case **within 7 days** upon your return. Failure to do so will result in a zero score for that assignment.

Final Exam

No make-up of the final exam is permitted. MISSING THE FINAL EXAM IS A SERIOUS ISSUE. Students who miss the final exam shall receive a grade of "F" for the course. Students with an acceptable excuse (as provided in the list above) and if the student was achieving a passing grade (C- or better) in all course work up until the final exam, can arrange with the instructor for a process to remove the **incomplete (1 grade), that will be awarded**, from their records within the time period stated by University policy.

GENERAL***Course Participation:***

Participation in this course is strongly encouraged. It helps students and teaching staff clarify material, and promotes scientific dialogue. Scientific data clearly shows that attendance and participation do benefit student understanding and do positively influence student grades. Typically, students who succeed attend lecture on a regular basis. Students are expected to attend all lectures, although it is discretionary. Note that students are responsible for any material discussed in their absence, and for determining if any bonus assignments have been posted. For students whose final scores fall right on the border of a grade change (ex. A-/B+), active engagement and participation in the course **may** increase your chances of receiving the higher score. *This would be exclusively at the discretion of the instructor.*

Course Materials and Handouts:

In addition to the textbook and class handouts, computer and internet access shall be required for this class. For students who do not otherwise have access to a computer or the internet, computers **may** be available at several campus locations including the main reading room in the library. Copies of the lecture PowerPoint's will also be available in Acrobat format (.pdf files) at the BIOL 3310 BLACKBOARD site after the lecture has taken place.

Homework and Revision:

Plan to devote approximately 3 hours per lecture hour, on average. This does not include classroom time. So, for each approximately 75 minute lecture, you should spend 4 quality revision hours!

Electronic Aids:

The use of electronic devices is prohibited during exams and assessments. The only exception shall be simple calculators, which must be declared and checked by the staff prior to use. No cell phones (or cell phone calculators), no iPads, or any other electronic devices are permitted. Leave all cell phones in your bags during examinations and tests (best not to bring them for security reasons). **Please turn any ringers off!**

During other periods, please prevent your electronic devices from interfering with instruction. If you must take a phone call, please have the courtesy to step out. The use of electronic aids to circumvent the spirit of any assessment is a very serious violation of policy, and is not permitted.

Regrade policy:

Regrade requests will only be accepted within **one week (7 days)** from the date a scored assessment is returned. For each question requiring attention, you must submit a written explanation describing why you believe your response should be reevaluated. Please know we reserve the right to regrade your **entire assessment**. As a result, your score could either increase or decrease.

BEWARE: A random sample of all assessments will be photocopied after initial grading. If a comparison of the photocopy to the exam submitted for regarding indicates any alteration, the case will be forwarded to the Office of Judicial Affairs. **Never alter any exam, quiz, or other assessment material returned to you.**

Student Services:

There are many resources on campus. For more information please visit, <http://www.csustan.edu/tutoring/>. Tutoring Services are located in the Library building, room L112. Every student should make an effort to visit with them and at a minimum have understanding of what services are available.

Student and faculty tutors, who have previously passes this class or administered similar material, are available from 8 am – 6 pm daily. This resource is available to all and is located in room Naraghi 124. No appointment is necessary and walk-ins are most welcome.

In addition, there is The Biology Club, which encompasses a group of former/present biology students who are available for consultation and advice. Check with the Biology Office in Naraghi Hall.

Disability Services:

If any student with any form of learning disability wishes or has registered for this course, they should contact the instructor as soon as possible so rapid arrangements can be made to address those needs. CSU Stan and this instructor are committed to making our courses accessible to all students, including students with limited mobility, impaired hearing or vision, and learning disabilities. Students who may need academic accommodation(s) services should visit the Disability Services web site at <http://www.csustan.edu/drs/contactus.html> and also contact the Disability Services Coordinator at the Disability Resource Services office (209) 667-3159 located in the Mary Stuart Rodgers Educational Services Gateway, Room MSR 210 or visit <http://www.csustan.edu/drs/> as early as possible in the semester so that appropriate arrangements can be made.

Group and independent assignments in BIOL 3310:

Some activities in BIOL 3310 involve group work and we encourage you to discuss any of the materials in the text, lectures, and/or discussion sessions with the instructors and other students, **but the work you submit must be your own for all of the following:**

- Quizzes
- Midterm and final assessments

That is, each student must generate their own answers **written in their own words** to all written questions. At the first instance of copied answers on assignments, no credit will be given *to all students with duplicate answers* and the assignments will be forwarded to the Vice-Chancellor for Undergraduate Affairs and the Office for Judicial Affairs. Subsequent copied assignments could lead to dismissal from course or the university (see section on Academic Integrity below).

Academic integrity:

Academic integrity is the foundation of an academic community and without it none of the educational or research goals of the university can be achieved. All members of the university community are responsible for its academic integrity. Existing policies forbid cheating on examinations, plagiarism and other forms of academic dishonesty. The current policies for CSU Stanislaus are described on the *Student Responsibilities web site pages* and also available from your instructor. The following general guidelines are adapted from Office of Judicial Affairs (www.csustan.edu/JudicialAffairs/.../Student_Judicial_Process-Academic.pdf):

Examples of academic dishonesty include:

- receiving or providing unauthorized assistance on examinations
- using unauthorized materials during an examination

- **plagiarism – using materials from sources without citations**
- **altering an exam and submitting it for re-grading**
- **fabricating data or references**
- **using false excuses to obtain extensions of time or to skip coursework**

The ultimate success of a code of academic conduct depends largely on the degree to which the students fulfill their responsibilities supporting academic integrity.

These responsibilities include:

- Be honest at all times.
- Act fairly toward others. For example, do not disrupt or seek an unfair advantage over others by cheating, or by talking or allowing eyes to wander during exams.
- Take group as well as individual responsibility for honorable behavior. Collectively, as well as individually, make every effort to prevent and avoid academic misconduct, and report acts of misconduct that you witness.
- Do not submit the same work in more than one class. Unless otherwise specified by the instructor, all work submitted to fulfill course requirements must be work done by the student specifically for that course. This means that work submitted for one course cannot be used to satisfy requirements of another course unless the student obtains permission from the instructor.
- Unless permitted by the instructor, do not work with others on graded coursework, including in class and take-home tests, papers, or homework assignments. When an instructor specifically informs students that they may collaborate on work required for a course, the extent of the collaboration must not exceed the limits set by the instructor.
- Know what plagiarism is and take steps to avoid it. When using the words or ideas of another, even if paraphrased in your own words, you must cite your source. Students who are confused about whether a particular act constitutes plagiarism should consult the instructor who gave the assignment.
- Know the rules – ignorance is no defense. Those who violate campus rules regarding academic misconduct are subject to disciplinary sanctions, including suspension and dismissal.

Flexibility Clause:

Circumstances may arise during the course which may prevent the staff from fulfilling each and every component of this syllabus; therefore, the syllabus may be subject to small adjustments. Students will be notified prior to any changes, if possible.

Welcome & Great Learning!

Biol 3310 - Autumn 2015 - Lecture Timetable:

No.	Date	Lecture Topic	Pages
1	T 25 Aug	Introductions and Course Expectations; 1 - A Preview of the Cell	1-17
2	R 27 Aug	2. The Chemistry of the Cell	18-40
3	T 1 Sep	3. The Macromolecules of the Cell	41-74
4	R 3 Sep	4. Cells and Organelles	75-105
5	T 8 Sep	5. Bioenergetics: The Flow of Energy in the Cell	106-128
6	R 10 Sep	6. Enzymes: The Catalysts of Life	129-155
E1	T 15 Sep	Mid-term 1 Exam (Chapters 1 to 4)	-
7	R 17 Sep	7. Membranes: Their Structure, Function, and Chemistry	156-193
8	T 22 Sep	8. Transport Across Membranes: Overcoming the Permeability	194-223
9	R 24 Sep	9. Chemotrophic Energy Metabolism: Glycolysis and Fermentation	224-251
10	T 29 Sep	10. Chemotrophic Energy Metabolism: Aerobic Respiration	252-292
11	R 1 Oct	11. Phototrophic Energy Metabolism: Photosynthesis	293-323
E2	T 6 Oct	Mid-term 2 Exam (Chapter 1 to 10)	-
12	R 8 Oct	12. The Endomembrane System and Peroxisomes	324-364
-	T 13 Oct	No Class -	
13	R 15 Oct	13. Signal Transduction Mechanisms: I. Electrical and Synaptic Signaling..	365-391
14	T 20 Oct	14. Signal Transduction Mechanisms: II. Messengers and Receptors	392-421
15	R 22 Oct	15. Cytoskeletal Systems	422-448
16	T 27 Oct	16. Cellular Movement: Motility and Contractility	449-476
17	R 29 Oct	17. Beyond the Cell: Cell Adhesions, Cell Junctions, and Extracellular S..	477-504
E3	T 3 Nov	Mid-term 3 Exam (Chapters 1 to 16)	-
18	R 5 Nov	18. The Structural Basis of Cellular Information: DNA, Chromosomes..	505-548
19	T 10 Nov	19. The Cell Cycle, DNA Replication, and Mitosis	549-599
20	R 12 Nov	20. Sexual Reproduction, Meiosis, and Genetic Recombination	600-644
21	T 17 Nov	21. Gene Expression: I. The Genetic Code and Transcription	645-678
22	R 19 Nov	22. Gene Expression: II. Protein Synthesis and Sorting	679-708
23	T 24 Nov	23. The Regulation of Gene Expression Part 1	709-721
-	R 26 Nov	Thanksgiving Holiday – No Class	
E4	T 1 Dec	Mid-term 4 Exam (Chapters 1 to 23)	-
24	R 3 Dec	24. The Regulation of Gene Expression Part 2	722-756
25	T 8 Dec	25. Cancer Cells Part 1	758-765
26	R 10 Dec	26. Cancer Cells Part 2	766-793
Fin	R 17 Dec	EXAM - FINAL Thursday 17th Dec 8:30am-10:30am	-

PLEASE NOTE: Exams shall use the Green Scantrons. Scantrons will not be provided; please buy a pack from the bookstore. Always bring Scantrons with you to all sessions.

Learning Outcomes for Biol 3310

- Learn the molecular structure of the major biomolecules that comprise cells, organelles, and biochemical processes.
- Knowledge of the central concept for cellular functioning, DNA to RNA to Protein, by integrating biomolecules, biotechnology, regulating mechanisms, signals, signaling pathways and cancer.
- Understand how cells breakdown and build basic biomolecules
- Learn how cellular organelles communicate with each other.
- Show a deeper understanding of the parts of a cell, how they work, and the limits of our current knowledge.
- Demonstrate how evolution acts at the level of the gene and genome
- Show a sense of how cell biologists ask and answer questions experimentally
- List the structures, properties and biological significance of the major classes of organelles found in living organisms and the relationship between molecular structure and biological function.
- Compare and contrast how researchers use basic knowledge of biomolecules and cellular processes to study molecular and cellular biology.
- Enumerate the similarities and differences between different cell types.
- Compare and contrast the different types of microscopy and outline when each technique is most appropriate to be used.
- Articulate the scientific vocabulary used in communicating information in cell biology.
- Apply scientific evidence learned from one cell type to derive new hypotheses on the cell biology of different cell types.