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Zero Textbook Cost Syllabus for BIO 3005 (Molecular and Cellular Biology)

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DEPARTMENT OF NATURAL SCIENCES, BARUCH COLLEGE, CUNY
BIO 3005, Molecular and Cellular Biology, Spring 2018

<i>Section</i>	<i>Instructor</i>	<i>Time</i>	<i>Room</i>
Lecture BIO 3005 EMWL	Dobi	MW 2:30-3:20 PM	
Laboratory BIO 3005 EMWA	Dobi	MW 3:45-5:25 PM	
Laboratory BIO 3005 EMWB	Macklin	MW 3:45-5:25 PM	

M W	Lecture Topics	Laboratory Exercise
1/29	Cells and Organelles (Reading Unit 1)	Lab: Lab Safety (<i>Joint session; meet in 407</i>)
1/31	Enzymes (2)	Lab: Pipettes and Solutions
2/5	Microscopy (3)	Lab: Microscopes
2/7	Membrane Structure and Function (4)	Lab: Membrane Permeability
2/14	Membrane Permeability (4)	Lab: Nucleic Acid Extraction from Plants
Tu2/20	DNA Structure and Function (5)	Lab: GAPDH PCR I; Scientific Writing Abstracts
2/21	Transcription (6)	Lab: GAPDH PCR II; Scientific Writing Materials and Methods
2/26	Regulation of Transcription I (6)	Lab: Electrophoresis of PCR Products; Scientific Writing Figures
2/28	Regulation of Transcription II (6)	Paper: Martens, Laprade and Winston, 2004; Duina et al., 2014
3/5	Chromatin and Epigenetics (6)	Paper: Deng et al., 2012; Dekker et al., 2002
3/7	Exam I	<i>no laboratory scheduled</i>
3/12	RNA Processing and Transport (7)	Lab: Genomics (VC Computer Lab Location TBA)
3/14	Translation (8)	Lab: ELISA; <i>choose topic for final paper/presentation</i>
3/19	Protein Targeting, Sorting and Modification I (8)	Lab: Signal Transduction Part I; Ethics Week Discussion
3/21	Protein Targeting, Sorting and Modification II (8)	Lab: Signal Transduction Part II; Scientific Writing Results
3/26	Signal Transduction I (9)	Lab: Signal Transduction Part III; Paper: Keskin et al., 2017
3/28	Signal Transduction II (9)	Lab: Signal Transduction Part IV; <i>hand in lab notebook</i>
4/9	The Cytoskeleton (10); Exam II Due	Paper: Deshaies and Schekman, 1987
4/16	Cellular Movement (10)	Lab: Cell Motility Part I
4/18	Cell Adhesion and the Extracellular Matrix (10)	Lab: Cell Motility Part II
4/23	Exam III	<i>no laboratory scheduled</i>
4/25	DNA Replication (11)	Lab: Visualizing the cytoskeleton in <i>Drosophila</i> •
4/30	Cell Division: Mitosis (12)	Paper: Yarrow et al., 2005; Soderholm and Heald, 2005•
5/2	Cell Division: Meiosis (12)	Lab: Mitosis in Onion Root Tip Cells Part I; Paper: Mingle, et al., 2005; Medioni et al., 2012
5/7	DNA Recombination, Damage and Repair (13)	Lab: Mitosis in Onion Root Tip Cells Part II
5/9	Posttranslational Control (14)	Lab: Analysis of Meiosis in <i>Drosophila</i> testes
5/14	Recombinant DNA (15)	Presentations; <i>hand in lab notebook</i>
5/16	Cancer (16)	Presentations (<i>final paper due</i>)
	Take Home Final Exam	<i>due on Exam date posted by registrar</i>

• *EMWB/Macklin section will switch these two dates with paper discussion 4/25 and lab 4/30.*

Assignment Due Dates:

Ethics Week Paper	2/14
Lab Report: Membrane Permeability	2/28
Lab Report: Plant GAPDH Gene Lab Report	3/21
Lab Notebook	3/28 and 5/14
Take Home Exam II	4/9
Lab Report: Signal Transduction	4/18
Lab Report: Cell Motility	5/7
Final Paper	5/16



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Contact Information:

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Office:

Office Hours: Mondays at 1:30pm, and by appointment

Professor Kim Macklin

Email:

Office:

Office Hours: Mondays at 5:30pm, and by appointment

Evaluative Criteria:

Exams*	40%
Lab Reports*	25%
Lab Notebook	10%
Ethics Week Paper	5%
Presentation and Final Paper	10 %
Total	100%

For letter grades, please consult the Baruch College Registrar.

* There will be four exams (2 in-class exams and 2 take home exams) and four lab reports. The lowest exam grade and the lowest lab report grade will be dropped; the remaining 3 exams and labs will be given equal weight.

POLICIES

Academic Integrity: Cheating and plagiarism are serious offenses. The following definitions are based on the College's Academic Honesty website:

Cheating is the attempted or unauthorized use of materials, information, notes, study aids, devices or communication during an academic exercise. Examples include but are not limited to:

- Copying from another student during an examination or allowing another to copy your work
- Unauthorized collaborating on a take home assignment or examination
- Using unauthorized notes during a closed book examination
- Using unauthorized electronic devices during an examination
- Taking an examination for another student
- Asking or allowing another student to take an examination for you
- Changing a corrected exam and returning it for more credit
- Submitting substantial portions of the same paper to two classes without consulting the second instructor
- Preparing answers or writing notes in a blue book (exam booklet) before an examination
- Allowing others to research and write assigned papers including the use of commercial term paper services

Plagiarism is the act of presenting another person's ideas, research or writing as your own, such as:

- Copying another person's actual words without the use of quotation marks and footnotes (a functional limit is four or more words taken from the work of another)
- Presenting another person's ideas or theories in your own words without acknowledging them
- Using information that is not considered common knowledge without acknowledging the source
- Failure to acknowledge collaborators on homework and laboratory assignment

My policy is to give a 0 to any assignment that has been plagiarized or an exam on which you have cheated. Any subsequent offense will result in a failing grade in this course. In addition, I am required by College policy to submit a report of suspected academic dishonesty to the Office of the Dean of Students. This report becomes part of your permanent file. Please see "Sharing Policies" below for additional instances of academic integrity violations.

Students are required to write and sign the following pledge on every exam/assignment: "I pledge that I have neither given nor received assistance during this (examination/assignment)."

Accommodations: At Baruch, we strive to ensure that no student with a disability is discriminated against and that none is denied participation in College programs and activities for lack of reasonable accommodations. Some people think that a disability has to be visible to be accommodated. This is not the case. If you feel that you may need a reasonable accommodation based on a disability, please contact the staff at the Office of Disability Services, Newman Vertical

Campus, Room 2-271, or by phone at (646) 312-4590. Please speak to the Office of Disability Services before you speak to your instructor.

Assignments: Will be posted to Blackboard, and should be submitted in an appropriate file format (PDF, Word doc) to that website. Assignments are due by the end of the day (11:59pm) on the due date; please see Late Policy. Pictures, graphs and charts may be handed in directly as a separate appendix if you cannot scan these. The general rules for assignments are: 1 inch margins, no less than 11 point font for body text, double-spaced. No title pages are required, but please do remember to label all assignments with your name. Grading rubrics will be posted with the assignment on Blackboard. *Please do not submit Google Docs for your assignments.*

Attendance: Your participation is important to the success of this course. I expect you to attend every class, but recognize that sometimes emergencies occur. You are permitted unexcused absences equaling twice the number of course meeting times/week (in this course, 4). If you are absent more times than that, your final grade will be reduced 5 percent for each additional absence. Attendance is taken both in lecture and in the laboratory and you are expected to attend both sections each day. *You are responsible for making sure that your attendance is counted – credit will not be given retroactively if you forget to sign in.* It is difficult, if not impossible, to make up missed laboratory work, but you will be responsible for these lab reports - please obtain data from your lab group.

Citations: Scientific citation is very specific: each fact/idea/discovery needs its own reference. When listing references for this course, please use the inline/in-text citation format of (Author, Year) and in the references section provide (at least) the Author, Title, Year of Publication, Volume and Source (Book or Journal). You will be given specific instructions for how to cite the individual laboratory exercises.

Communications: If you do not receive a response to an email sent to your instructor within a reasonable amount of time (a few days with the exception of college breaks), you may assume it was not received. It is your responsibility to follow up with your instructor.

Decorum and Electronic Devices Policy: The classroom is a learning environment, and we can all work together to minimize disruptions. Please be respectful of your instructor and your fellow students. (1) Arriving late and/or leaving early interferes with other students' ability to learn, and is not permitted. Late students/students who leave early can miss assignments or quizzes, and may be marked absent. (2) Use of electronic devices in the classroom for texting and other non-academic pursuits is not only distracting to the instructor and to students seated around you, but rude. Please silence all electronic devices and place them in your bags before class. If your use of electronic devices disrupts the instructor or other students, you may be asked to leave and will receive an absence for that day. *Use of a cell phone for any reason during an exam, quiz or practical is considered to be cheating, and you will be asked to leave the classroom and referred to the Dean of Students* (see Academic Integrity, above). (3) Many of you will want to use your phones, tablets and laptops in the laboratory as a digital way to view the material. Please be aware of lab safety while using your devices in the lab, keep workspaces and walkways clear and WASH YOUR HANDS before using your devices. (4) The classroom is large and we often need to contend with outside noise. Please keep (unprompted) class discussion to a minimum so your fellow students are able to listen. Please do ask questions!

Exams: Exams will be open-answer (not multiple choice). Exams will cover material from lectures, paper discussions and labs. The exams will be cumulative, in the sense that the information we discuss will build on itself for the duration of the course. You may use a pencil or a pen on exams. Where multiple answers are given to a question, and no indication is made for which answer you wish the instructor to grade (by circling/boxing your answer), the answer will be marked as incorrect. If a student arrives so late to an exam that other students have already handed in their papers and left, the late student will not be permitted to take the exam. Make-up exams are at the instructors' discretion.

Extra Credit: There will be no extra credit assignments for this course.

How to do well in this course: This course covers a large amount of material, but importantly, I am not just looking for you to remember what you've learned but to be able to apply the information practically to scientific questions. To do this, you will need to master the material as it is presented, rather than trying to "cram" everything just before the exam. I can't speak to whether it's better to do the readings before or after the lecture – that's a matter of personal preference - but the reading will help reinforce the lectures. Some students benefit from alternate presentations of the material - for this I can recommend Alberts, *Molecular Biology of the Cell* and Hardin, *Becker's World of the Cell*, which are on reserve in the Newman Library. Each lecture I will present "Challenge Questions" to think about; these are great study

aids for the exam. When I was in college, I found that typing and outlining my notes after class or before exams was a good way to help me remember things. I also found that handwriting notes in class, while missing some detail, often helped me to organize what I was learning and really consider what I was writing in a way that transcribing into a laptop did not. And of course you can draw diagrams and cells, which is harder to do in a word processing program.

Reading scientific literature is probably new to all of you, and can be challenging. But it doesn't have to be! The best way to get better at reading a scientific paper is to practice doing it. The best readers do so with a pencil or pen in hand to annotate what they are learning. They label the wells on gels and the lines on graphs in the figures - brightly colored pens work especially well for this. Even experienced scientists use Google or Wikipedia to read up on unfamiliar terminology and techniques. A well-read paper should have markings all over it!

Lab reports should be brief, but contain all the information necessary for another student to repeat the experiment and understand the results. Do give context for what you have written, cite outside sources appropriately, and label all figures and charts. If you need help, please consult the Writing Center.

Please do not hesitate to attend my office hours or email to arrange another time to meet. I am happy to clarify the material for you, help you with course questions, navigate majors requirements, talk about your post-graduation plans, advise on graduate or medical school or just chat about science.

Lab Notebook: Please purchase a bound (that is, not spiral) notebook for this course. Composition notebooks are a good choice. Lab notes should be taken in PEN – it's a good idea to use a ballpoint rather than gel or roller ball, as ballpoint does not run should your notes get wet. Use the first page(s) of your notebook as a table of contents, and number your pages. Data should be organized with headings. Please take all notes and answer all lab questions in this notebook. Each lab should be properly dated and titled, and all figures, graphs and charts appropriately labeled. Pictures may be printed and taped into the notebook. If you miss a lab, you are still responsible for that section of your notebook – please get this information from your lab group.

Lab Safety: A number of specific lab policies will be gone over during your first lab session. Please follow all lab safety guidelines given by your instructor. Please note that food, beverages, gum and candy will not be allowed in the lab. Our labs are used throughout the day - just because we are not doing experiments one day does not mean there were no safety hazards in the lab that day. Always wash your hands on your way out of the lab.

Late Policy: Assignments (such as lab reports) that are handed in after the due date will be subject to a five percent decrease in grade for each day they are late. If a student arrives so late to an exam that other students have already handed in their papers and left, the late student will not be permitted to take the exam.

Recommended Text and Readings: This is a zero textbook course. Please register for SciTable, hosted by Nature.com, for access to the readings. In each unit you will find an "Explore Further" reading; these are not required but build on the material we cover in class. Additional readings, including PDFs of the discussion papers, will be posted to Blackboard.

Sharing Policies: Some students may wish to record the lecture on their electronic devices for note taking. Audio recordings will be permitted; video recordings will not. (Subject to reasonable disability accommodations.) Lecture slides will be provided to enrolled students on Blackboard. Lecture recordings and slides contain the intellectual property of Nature Publishing Group and the professor; it will be considered a violation of academic integrity (not to mention a potential copyright infringement) to share these materials publicly (eg., on websites accessible to search engines like CourseHero). Posting of such material will decrease the final grade by 5 points. Posting of exams, papers and lab reports to these types of websites will decrease the final grade by 10 points (an entire letter grade) and will result in a report to the Dean of Students.

Learning goals:

Upon completion of this course, students will be able:

- To identify the structures and functions of cellular organelles
- To understand the regulation of cell communication, division and growth
- To read and understand primary journal articles about cell and molecular biology
- To describe the cellular processes of replication, transcription and translation
- To determine the appropriate experimental technique for answering questions about the cell
- To clearly present scientific information gleaned from primary sources