**Cell Biology (Bio 206)**

**Lecture: R, 11:00 – 1:45, AA413**

**Lab: T, 11:00 – 1:45, AA413**

**4 credits**

**Spring 2017**

Instructor: Dr. David Fernandez

Office: AA352 Row 5

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Office hours:

Mondays/Wednesdays (Rm. 352): 9:00 – 9:30, 10:45 – 1:45; Fridays (Rm. 415): 9:00 – 12:00

Also See “Office Hours” document in BB.

\*Please email me to set up an appointment to ensure I am not already meeting with another student\*

*The purpose of this syllabus is to address relevant administrative concerns and policies. If you have questions of this nature throughout the semester, please consult this syllabus first, before directing these questions to your Professor.*

**Census Date: 1/26/17**

Last day to withdraw with refund

**Withdraw Date: 3/21/17**

Last day to withdraw without a grade penalty (receive a “W”)

**Course Text (Required)**

Essential Cell Biology by B. Alberts et al. 4th Ed.

**Course Overview**

Cell Biology will offer students the chance to explore life at the cellular and molecular level. Basic biological concepts, such as structure/function, thermodynamics, and evolution, will also be addressed within the cellular context. Prerequisites for this course include completion of Bio 101 and 102 and Chm 111 or Chm 111 and 112 and Bio 101. Upon successful completion of this course, the student should be able to:

A. describe the structures commonly found in eukaryotic and prokaryotic cells   
B. explain the functions of the cell parts   
C. describe the chemical composition of cells and their parts   
D. explain the basic principles of bioenergetics and apply these principles to enzymology and metabolism   
E. describe both metabolic and genetic regulatory mechanisms in cells   
F. describe the patterns of growth, reproduction, and heredity in prokaryotic and eukaryotic cells   
G. explain the differences between generalist and specialized cells   
H. describe some of the common specialized cell functions   
I. explain the concept of unity and diversity of cell structure and function

**How to Get the Most Out of This (and Probably Any) Course:**

Consider the following as a checklist for success. If you wish to improve your grade, first consult this checklist and perform an honest self-evaluation:

* Be present physically and mentally, from start to finish, at every class. Do NOT pack up your belongings before class officially ends.
* Study without distractions, at least 10 hours per week, outside of scheduled lecture or lab times.
* Check your NOVA email at least once per day.
* Turn off your phone/tablet/laptop unless using these items for note taking or reading PPTX slides.
* Ask and/or answer as many questions as you can.
* Come to office hours / email questions frequently.
* Take detailed notes during class\*.

**Exams**

Exams will be administered as designated in the schedule. You will generally be given 75 minutes to complete your exams, with a shortened lecture following each exam (with the exception of Exam 4, which will not be followed by a lecture). If you arrive late to class, you will miss all or part of the time allotted for taking the exam, so come on time if you want the maximum amount of time to take your exam. During the course of the semester, three non-cumulative exams will be given, focusing primarily on the material since the proceeding exam. All cell phones and other such devises must be completely off for the duration of an exam. Exam format will be essay questions as well as multiple choice questions (NO scantron needed). There are NO make-up exams. However, the lowest exam grade will be dropped. If you will need to miss an exam for any reason, this is the exam that will be dropped.

\*\*\*The Honor Code applies at all times. Cheating during an exam in any form will not be tolerated. Wandering eyes, whispering, intentionally allowing other students to clearly see your exam will result in a 20% drop on that exam grade, for a first offense. A second offense will result in a 0 being given on that exam.\*\*\*

**Study Guides**

Study guides will be posted on Bb. Study guides serve as homework and as practice exams. They are aimed at focusing your efforts when preparing for each exam, but are not necessarily a cumulative list of topics. Study guides may be updated or changed at any point during the semester at the Instructor’s discretion. If something appears in your PPTX slides, either from Bb or (especially) during class, it is fair game to appear on your exam, so please study accordingly.

**Review Article**

Each student will write a review article on a topic of his or her choice within the field of cell biology. See Bb for detailed instructions.

**Extra Credit**

Extra credit opportunities may be offered during the semester, at the discretion of the Professor. Exams may be curved at the discretion of the Professor. Extra credit may mean the difference between a letter grade and the next letter grade up, but only if the student’s overall grade is extremely close (probably within 1% of the next letter grade). Relying on extra credit is NOT the way to earn a grade.

**Time expectations for grading**

Exams and/or other assignments will be graded as soon as possible. The actual timeframe may vary. Inquiring into when you can expect to see your grade will NOT expedite the grading process. Rather, your focus should be on preparing for the next grading opportunity.

**\*Lectures/Note Taking**

Lecture PPTs will be posted on Bb under “Course Documents” prior to each class. The slides you see on the screen will be the same as the slides you have in your PPT notes, and so it may be unnecessary and counterproductive to try to copy every word from the screen during class. Instead, your notes should focus on concepts, themes, and points of emphasis made during class. Try to write down what isn’t already written for you.

**Grading Policy**

Grades are earned, not given. Grades reflect not only the student’s effort, but also comprehension and mastery of the material. Simply “working hard”, while necessary, does not warrant a specific grade. As such, “I think I deserve a grade of \_\_\_\_ because I worked so hard and always came to class” is not an acceptable argument, and will not hold any value. This is especially true at the end of the semester. The time to think about your grade is starting from the very first day, not waiting until the last one. If you need a grade of \_\_\_\_ to get into a specific program or further your career, I am here to help you achieve that. But you are the one responsible for earning that grade.

Bio 206 consists of lecture and laboratory. Attendance and participation will be taken into consideration for borderline grades (generally 1.0 – 1.5% from the next grade up). Students at the border of a grade need not request or petition their grade to be rounded up. I will make that determination based on attendance, participation, and overall effort demonstrated throughout the semester.

Your overall grade (out of **1000 pts**) will be calculated as follows:

**Lecture (700 pts):**

Review Paper **= 100 points**

Four exams (Lowest exam dropped, 200 pts each) **= 600 points**

**Lab (300 pts):**

See lab syllabus.

**Overall course grades will be assessed as follows:**

**A: > 90 %**

**B: 80-89.99%**

**C: 70-79.99%**

**D: 60-69.99%**

**F: < 59.99%**

**There are no separate attendance or participation grades, but these may factor into bumping up a borderline grade (usually if it is about 1.0 – 1.5% from the next letter grade up).**

**Tutoring**

Students are strongly encouraged to bring questions or points of confusion directly to the instructor. However, for additional assistance, you may contact the Academic Center for Excellence, located in AA 229 (703-845-6363). They offer free tutoring for enrolled students.

**Special Needs/Accommodations**

If you need special assistance, you may contact disability services (nvcc.edu/depts./disability). You may then bring me documentation from disability services at the beginning of the semester, at which time we will discuss any special accommodations to best suit your needs.

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| **Tentative Date** | **Topics** |
| 1/12 | Intro / Syllabus /  Intro to Cells / Model Organisms |
| 1/19 | General Chemistry / Organic Chemistry / Biochemistry |
| 1/26 | Protein Structure & Function |
| 2/2 | Enzymes & Metabolism |
| **2/9** | **Exam 1** |
| 2/16 | Membrane Structure,  Function & Transport |
| 2/23 | Cytoplasmic  Membrane Systems |
| 3/2 | Cytoskeleton |
| **3/9** | **Spring Break** |
| **3/16** | **Exam 2** |
| 3/23 | Cellular Respiration / Photosynthesis |
| 3/30 | DNA / Chromosomes /  Genes / Gene Regulation |
| 4/6 | Transcription & Translation |
| **4/13** | **Exam 3** |
| **4/20 (papers due)** | DNA Replication & Repair /  Mitosis & Meiosis / Cell Cycle |
| 4/27 | Stem Cells / Cancer /  Signal Transduction |
| **5/4 (11:30 – 1:10)** | **Exam 4 (NOT cumulative)** |

**Lab Syllabus**

**Lab Conduct**

There is no eating or drinking in the laboratory. Students will work in groups to complete their assignments during each lab period. All students must be useful to his or her lab group. Students not actively participating in the lab assignment, not being engaged in his or her group’s progress, or in any other way not being useful to his or her lab group, may be docked points on the lab Mid-Term or Final Exams (at the discretion of the Professor).

**Lab Materials**

Lab instructions for each lab will be provided prior to that week’s lab session. There is no separate lab manual. All other lab materials will be provided unless otherwise specified by the Professor.

**Lab Grading**

The laboratory portion of the course makes up **30%** of your grade (**300/1000 total points**). Laboratory grades will be earned as follows:

Lab Exam 1: **100 points**

Lab Exam 2: **100 points**

Lab Report: **100 points**

**None of the lab grades will be dropped.**

**Lab Exams**

The Lab Exams will consist of free response / short answer questions focused primarily on laboratory techniques and principles. Make-up Lab Exams may be granted for extenuating circumstances. Notification (via email) is required BEFORE, and documentation is required AFTER, to grant a make-up Lab Exam. For example, if you are ill and cannot take the Lab Exam that day, you would need to email me before the Lab Exam, and provide a doctor’s note afterwards.

\*\*\*The Honor Code applies at all times. Cheating during an exam in any form will not be tolerated. Wandering eyes, whispering, intentionally allowing other students to clearly see your exam will result in a 20% drop on that exam grade, for a first offense. A second offense will result in a 0 being given on that exam.\*\*\*

**Lab Report\***

APA format.

Lab reports and drafts must be submitted in SafeAssign in Bb as a DOCX file. Failure to do so may result in loss of points for this assignment. Drafts may be submitted up to two business days before the final report is due. The format of the lab report will be as follows (courtesy of Dr. Emblom-Callahan):

Use section headers for each section:

Introduction, Hypothesis, Materials and Methods, Results, Discussion, Conclusion, References.

The report should have an appropriately descriptive title.

Introduction: 2 or 3 paragraphs introducing the topic and the current state of the research on the topic to date (Sources within last 18 months).

Hypothesis: The hypothesis should be a statement that is testable and falsifiable. This NOT an “if..then” construct. It does not ask a question. It should not include an explanation (that should be done in the introduction).

Materials and Methods: Use sentences to describe each process that was performed to generate the data.

Results: Results include any figure(s) or table(s) or images. Each piece of data should have a narrative by way of a COMPLETE sentence stating what the figure/table/image is showing (just the MAIN point – not every little point depicted).

Discussion: Explain why you got the data you did. This should be a 2 paragraph explanation, maybe 3 paragraphs. The discussion can refer back to ideas introduced in the introduction and should lead up to the reasoning that determined the conclusion (which should be stated only in the next section…)

Conclusion: State whether the data did or did not support the hypothesis. No need to do any explaining here, you have already done all the explaining in the discussion. This is a VERY short section.

References: You must include at least 5 references. These should not be wiki, ask or other on-line, non-academic (.edu) or non-peer reviewed sources. There are plenty of peer review journals for you to use. Ask the reference librarian for help!

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| **Date** | **Lab Experiment** |
| 1/10 | Enzymes |
| **1/17** | **MLK Day** |
| 1/24 | Bacterial Transformation / pGLO (Lab Report) |
| 1/31 | pGLO Analysis / Writing Lab Reports |
| 2/7 | Light Microscopy |
| **2/14** | Fluorescence Microscopy / **Lab Reports Due** |
| 2/21 | Immunoblotting |
| **2/28** | **Lab Exam 1** |
| **3/7** | **Spring Break** |
| 3/14 | Basic Eukaryotic Cell Culture |
| 3/21 | Polymerase Chain Reaction |
| 3/28 | Analysis of PCR Product / Gel Electrophoresis |
| 4/4 | Real-Time PCR |
| 4/11 | Immunology / Blood Typing |
| 4/18 | DNA Extraction |
| **4/25** | **Lab Exam 2** |