BIOL 4500: Cell Biology (Spring 2014)

1. Course Information

- Course number and section: BIOL 4500 A or B
- Course name: Cell Biology
- Hours of credit: 4
- Pre-requisites or co-requisites as listed in university catalogue: Prerequisite: CHEM 3601 Minimum Grade: C and (BIOL 2230 Minimum Grade: C or BIO 223 Minimum Grade: C) and (BIOL 2270 Minimum Grade: C or BIO 227 Minimum Grade: C) or consent of the instructor
- Classroom location and room number: BC 2022 (for the lecture, MWF 8:00 am - 8:50 am), BC 2071 (for the lab, T 9:30 am - 12:20 am (section A), 2:00 pm - 4:50 pm (section B))
- Department, College, University: Department of Biology, College of Arts and Sciences, Valdosta State University

2. Instructor Information

- Instructor name: Dr. Jonghoon Kang
- Instructor contact: BC 2217, 229-333-7140, jkang@valdosta.edu
- Instructor office hours: Wed 9:00am - 11:00am

3. Course Description

- Course description as printed in university catalogue: Prerequisite: BIOL 2230; BIOL 2270; CHEM 3601. The organization and function of cellular structures in animal, plant, and microbial systems. Emphasis on the molecular basis of metabolism, transport, mobility, nerve conduction, and the cell cycle.
- Required texts, resources, and materials: *Essential Cell Biology, 4th Edition* by Bruce Alberts et al. from Garland Science. (ISBN-13: 978-0815344544)
- Required out-of-class activities: In addition to attending the lectures you need to
  - ✓ Read your notebook (very important).
  - ✓ Read the textbook (3.5months/semester x 4weeks/month x 5days/week = 70 days and the textbook size is about 700 pages. That means reading 10 pages per day is necessary for one time reading of the entire textbook.)
  - ✓ Work on all the exercise questions in the textbook.

4. Standards, Goals, Objectives, or Outcomes

- outcomes:

The departmental educational outcomes (listed in the university catalogue).

1. Develop and test hypotheses, collect and analyze data, and present the results and conclusions in both written and oral formats used in peer-reviewed journals and at scientific meetings.
3. Demonstrate an understanding of the cellular basis of life.

4. Relate the structure and the function of DNA/RNA to the development of form and function of the organism and to heredity.

- Course objectives or outcomes:
  - Describe basic terminology in cell biology.
  - Describe the underlying physical and chemical principles in cell biology.
  - Demonstrate an understanding of basic experimental and computational techniques in cell biology.
  - Demonstrate competency for the cell biology part in standard tests such as GRE, MCAT, and DAT.

5. Assignments (explicitly aligned with the goals, objectives, or outcomes)

- General description of the assignments: You need to read the textbook before and after the lecture. Also working on the exercise questions should enhance your understanding of the subject.
- Policies for missed assignments, make-up assignments, late assignments, and/or extra credit: There will be no extra credit in this course.

6. Assessment or Evaluation Policy

- Explanation of how grades are assigned: Grading will be based on the scores you get from the tests.
  Your class score (CS) = (∑ Test i score + Final Test score + Lab score)/11, where i is I to IV.
  The maximum score of the Test i is 100, where i is I to IV. The maximum score of the final is 400. The maximum score of Lab score is 300 (= 9 quizzes + 3 assignments + 8 results of 10 points each and 100 points of the lab final).
  If CS >= 90% then A for the final grade, if CS >= 80% then B, if CS >= 70% then C, if CS >= 60% then D and anything below will be F.
- Grading standards: You may get partial credit for answers that show logical developments but fail to derive the correct answers due to operational errors.

Record your scores in the table.

Exam	I	II	III	IV	Final	Sum 1
Score						

Lab	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	A1	A2
Score											
Lab	A3	R1	R2	R3	R4	R5	R6	R7	R8	Lab Final	Sum 2
Score											

Your score = (Sum 1 + Sum 2)/11

7. Schedule of Activities or Assignments, including university -scheduled final exam time (all schedule is tentative and may be subject to change)

Date	Class	Date	Lab
1/13	1. Cells	1/14	Basic Lab Mathematics (log, exponential)
1/15, 17	2. Chemical Components of Cells	1/21	How to Read and Write Scientific Papers **Q1**
1/22, 24	3. Energy, Catalysis, and Biosynthesis	1/28	Concentration Calculation
1/27, 29	4. Protein Structure and Function	2/4	Curve Fitting Using Excel: Enzyme and Chemical Kinetics (Computer Lab) **Q2**
1/31	5. DNA and Chromosomes	2/11	DNA Bioinformatics & Organelle Genome (Computer Lab) **Assignment 1 due (A1)**
2/3	**Exam I (100 points)**	2/18	Agarose Gel Electrophoresis **Assignment 2 due (A2) Result (R1)**
2/5	6. DNA Replication	2/25	What Is PCR and How Does It Work? **Q3 R2**
2/7, 10, 12	7. From DNA to Protein	3/4	DNA/RNA Microarrays **Q4 R3**
2/14, 17	8. Control of Gene Expression	3/11	Restriction Enzyme Digestion of DNA **Q5 R4**
2/19	9. How Genes and Genomes Evolve	3/25	Enzyme Microarrays **Q6 R5**
2/21	**Exam II (100 points)**	4/1	Introduction to ELISA Reactions **Q7 R6**
2/24, 26	11. Membrane Structure	4/8	Gel Filtration Chromatography **Q8 R7**
2/28, 3/3, 5	12. Membrane Transport	4/15	Principles of Enzyme Catalysis **Q9**
3/7, 10, 12	13. How Cells Obtain Energy	4/22	What is Osmosis? **A3 due; R8**
3/14, 24, 26	14. Mitochondria and Chloroplasts	4/29	**Lab Final Test (100 points)**
3/28	**Exam III (100 points)**		
3/31, 4/2, 4	15. Intracellular Compartments		
4/7, 9	16. Cell Signaling		
4/11, 14, 16, 18	17. Cytoskeleton		
4/21	**Exam IV (100 points)**		
4/23, 25	18. Cell Division Cycle		
4/28, 30	19. Sexual Reproduction		
5/2	20. Cellular Communities		
5/5	Review		
5/7	**Final Exam (8am-10am) (400 points)**		

Drop-Add: by Jan 17 at 1:30PM **Mid-Term: March 6**

8. Classroom Policies

- Attendance and tardiness: Any absence policy should conform to the university policy.
  University Attendance Policy from the VSU catalogue:
  "*The University expects that all students shall regularly attend all scheduled class meetings held for instruction or examination. When students are to be absent from class, they should immediately contact the instructor. A student who misses more than 20% of the scheduled classes of a course will be subject to receive a failing grade in the course*."
- Accommodations Statement:
  From VSU's Access Office http://www.valdosta.edu/access/facresources.shtml:
  "*Students requesting classroom accommodations or modifications due to a documented disability must contact the Access Office for Students with Disabilities located in the Farber Hall. The phone numbers are 245-2498 (V/VP) and 219-1348 (TTY)*."
- Academic Integrity: You know that cheating is a bad thing to do. Students caught cheating will receive a grade of F for the test in question and will be reported to the Dean of Students. You are expected to follow VSU's Academic Integrity Code.
  From VSU's Academic Integrity Code (the full code is available at http://www.valdosta.edu/academic/AcademicHonestyPoliciesandProcedures.shtml :
  "*Academic integrity is the responsibility of all VSU faculty and students. Faculty members should promote academic integrity by including clear instruction on the components of academic integrity and clearly defining the penalties for cheating and plagiarism in their course syllabi. Students are responsible for knowing and abiding by the Academic Integrity Policy as set forth in the Student Code of Conduct and the faculty members' syllabi. All students are expected to do their own work and to uphold a high standard of academic ethics. "*
- Classroom demeanor or conduct: Every student should make the lecture a comfortable and enjoyable learning experience. Late entry to the class room or leaving early is bad behavior. Common sense should be practiced and expected.
- Communication: All VSU-related correspondence should be conducted via VSU email addresses for both student and instructor.

9. Additional Information (at instructor's discretion)

- Expectations for competencies such as writing, technology skills, or performance: Students should be able to describe biological phenomena at the cellular level in terms of physics and chemistry.
- Instructional philosophy: I believe reading one book ten times is better than reading ten books one time each. This is the case for this course. Students are encouraged to practice all the exercise and examples in the textbook ten times.
- Strategies used to support learning: Students should take advantage of my office hours. Studying as a group (study group) should be a good idea.