

## **BIOL 4520: Molecular Biophysics (Fall 2013, CRN: 81305)**

### 1. Course Information

- Course number and section: BIOL 4520 A
- Course name: Molecular Biophysics
- Hours of credit: 3
- Pre-requisites or co-requisites as listed in university catalogue: Prerequisite: (MATH 2261 Minimum Grade: C or MATH 2261H Minimum Grade: C or MATH 1501 Minimum Grade: C) and BIOL 1107K Minimum Grade: C and BIOL 1108K Minimum Grade: C and BIOL 3200 Minimum Grade: C and BIOL 3250 Minimum Grade: C and (CHEM 1211 Minimum Grade: C and CHEM 1211L Minimum Grade: C or CHEM 1211K Minimum Grade: C) and (CHEM 1212 Minimum Grade: C and CHEM 1212L Minimum Grade: C or CHEM 1212K Minimum Grade: C) and (PHYS 1111K Minimum Grade: C or PHYS 2211K Minimum Grade: C) or consent of the instructor.
- Classroom location and room number: BC 1025, MWF 8:00 am - 8:50 am
- 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: Mon and Tue 9:00 am - 10:00 am

### 3. Course Description

- Course description as printed in university catalogue: Introduction to thermodynamics, kinetics, and their applications to biological systems. Students are expected to enhance their understanding of current biological literature that contains biophysical concepts covered in this course.
- Required texts, resources, and materials: *Introducing Biological Energetics: How Energy and Information Control the Living World*, 1st Edition by Norman W. H. Cheetham from Oxford University Press (ISBN-13: 978-0199575930).
- Required out-of-class activities: In addition to attending the lectures you need to
  - ✓ Read your notebook (very important).
  - ✓ Read the textbook.
  - ✓ Work on problems in the textbook and any other materials assigned in class.

### 4. Standards, Goals, Objectives, or Outcomes

- outcomes:  
The departmental educational outcomes (listed in the university catalogue).  
3. Demonstrate an understanding of the cellular basis of life.

- Course objectives or outcomes:
  - Describe basic terminology used in thermodynamics and kinetics.
  - Perform basic manipulations of thermodynamic and kinetic equations.
  - Interpret biochemical phenomena in terms of thermodynamics and kinetics.
  - Recognize the importance of physics and chemistry in the biological sciences.

#### 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 doing 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.  
 Class points (CP) =  $(\sum \text{Test } i \text{ score} + \text{Final Test score})/6$ , 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 200.  
 If CP  $\geq$  90% then A for the final grade, if CP  $\geq$  80% then B, if CP  $\geq$  70% then C, if CP  $\geq$  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
Score						

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

Midterm: Oct 3

Date	Chapter	Class	Date	Chapter	Class
8/12		Preface / Introduction	10/9	-	Will be announced
8/14	1	The Flow of Energy in Living Systems	10/11	-	Will be announced
8/16	3	Force and Energy Explored	10/14	7	The Strange Story of Water and Oil
8/19	3		10/16	7	
8/21	3		10/18	7	
8/23	3		10/21	8	Size Matters: Proteins and Enzymes
8/26	4	Which Way? An Introduction to Thermodynamics	10/23	8	
8/28	4		10/25	8	
8/30	4		10/28	-	Grad Student Presentation
9/2	-	Labor day	10/30	8	
9/4	4		11/1	-	<b>Test 3 (100 pt)</b>
9/6	4		11/4	9	Molecular Genetics – the Chemical basis of Heredity
9/9	4		11/6	10	Electron Gymnastics: Energy Revisited
9/11	-	<b>Test 1 (100 pt)</b>	11/8	10	
9/13	5	The Building Blocks	11/11	10	
9/16	5		11/13	10	
9/18	5		11/15	11	Cells and Metabolism
9/20	5		11/18	11	
9/23	6	How Fast, How Far? Chemical Kinetics and Equilibrium	11/20	11	
9/25	6		11/22	-	<b>Test 4 (100 pt)</b>
9/27	6		11/25	-	Thanksgiving
9/30	6		11/27	-	Thanksgiving
10/2	6		11/29	-	Thanksgiving
10/4	-	<b>Test 2 (100 pt)</b>	12/2	-	Review
10/7	-	Will be announced	12/4	-	<b>Final (200 pt) 8:00pm-10:00 am</b>

## 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 molecular and 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.