BIOL 4540 / 6540: Bioinformatics (Fall 2016, CRN: 82255 / 82505)

1. Course Information
   - Course number and section: BIOL 4540 A / 6540 A
   - Course name: Bioinformatics
   - Hours of credit: 3
   - Pre-requisites or co-requisites as listed in university catalogue: Prerequisite: BIOL 1107K, BIOL 1108K, and BIOL 3200 or permission of the instructor.
   - Classroom location and room number: BC 3018, MWF 1:00 pm - 1:50 pm
   - 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: W & R 2:00 pm - 3:00 pm

3. Course Description
   - Course description as printed in university catalogue: The theoretical principles underlying bioinformatics analysis and hands-on analysis using publicly available databases and software. Additional topics such as epigenetics or systems biology could be included.
   - Required texts, resources, and materials: *Practical Bioinformatics* by Agostino from Garland (ISBN: 9780815344568).

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:
       - ✓ Recognize the importance of integrative approach in the study of biology
       - ✓ Acquire and enhance quantitative reasoning aptitude
       - ✓ Refresh knowledge on basic concepts in genomics
       - ✓ Learn basic principles of bioinformatics
       - ✓ Familiarize with public databases and analysis tools of bioinformatics

5. Assignments
   - General description of the assignments: There will be three take-home exams, one term project, and a final exam. (see section 7 for details)
   - 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

Scale: A >= 90%, B >= 80%, C >= 70%, D >= 60%, F < 60%

Term Project due is 9/26. If you submit your project after the due date, your grade will be reduced by 10% per each date. In the project you need to collect a large number of data.

Term project score will be calculated based on the following formula.

Your term project score = (100 * number of correct data/total number of data) * [1 – 0.2 * (number of passing dates)]

For example, if the total number of data is 1250, and you submit your project 3 days after the due date, and your work contains 1200 correct answers, then your score = (100*1200/1250)*(1-0.2*3) = 38.4, otherwise it would be 96.

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

Date	Ch	Class		Date	Ch	Class		Date	Ch	Class
8/15		Introduction		9/23	6	Theory		11/2	11	Practice
8/17	1	Theory		9/26	6	Practice		11/4	12	Theory
8/19	2	Theory		9/28	7	Theory		11/7	12	Theory
8/22	2	Theory		9/30	7	Theory		11/9	12	Theory
8/24	2	Practice		10/3	7	Practice **Take Home Exam II (Due: 10/5)**		11/11	12	Practice
8/26	3	Theory		10/5	7	Discussion of Take Home Exam II		11/14	8 - 12	Review; **Take Home Exam III (Due: 11/14)**
8/29	3	Practice		10/7	8	Theory		11/16		Discussion of Take Home Exam III
8/31	4	Theory		10/12	8	Theory		11/18		Epigenetics
9/2	4	Theory		10/14	8	Practice		11/21		Epigenetics
9/7	4	Practice **Take Home Exam I (Due: 9/9)**		10/17	9	Theory		11/28		Epigenetics
9/9		Discussion of Take Home Exam I **Term Project I (Due: 9/26)**		10/19	9	Theory		11/30		Epigenetics
9/12	5	Theory		10/21	9	Practice		12/2		**Grad Student Presentation**
9/14	5	Theory		10/24	10	Theory		12/5		Review
9/16	5	Practice		10/26	10	Practice		12/7		**Final 12:30 – 2:30 pm**
9/19	6	Theory		10/28	11	Theory				
9/21	5	Theory		10/31	11	Theory				

9/5: Labor Day Holiday;   10/6: Midterm;   10/10 – 10/11: Fall Break

Textbook Contents

1. Introduction to Bioinformatics and Sequence Analysis   2. Introduction to Internet Resources
3. Introduction to the BLAST suite and BLASTN   4. Protein BLAST: BLASTP
5. Cross-Molecular Searches: BLASTX and TBLASTN   6. Advanced Topics in BLAST
7. Bioinformatics Tools for the Laboratory   8. Protein Analysis
9. Explorations of Short Nucleotide Sequences   10. MicroRNAs and Pathway Analysis
11. Multiple Sequence Alignments   12. Browsing the Genome

Score Table

Exam I (100)	Exam II (100)	Exam III (100)	Term or PPT (100)	Final (200)	Sum (600)	Class (SUM/6=100)

8. Classroom Policy
Accommodations Statement
Students with disabilities who are experiencing barriers in this course may contact the Access Office for assistance in determining and implementing reasonable accommodations. The access Office is located in Farbar Hall. The phone numbers are 229-245-2498 (V), 229-375-5871. For more information, please visit VSU's Access Office or email: access@valdosta.edu.

Title IX Statement
Valdosta State University (VSU) is committed to creating a diverse and inclusive work and learning environment free from discrimination and harassment. VSU is dedicated to creating an environment where all campus community members feel valued, respected, and included. Valdosta State University prohibits discrimination on the basis of race, color, ethnicity, national origin, sex (including sexual harassment and sexual violence), sexual orientation, gender identity, religion, age, disability, genetic information, or veteran status, in the University's programs and activities as required by applicable laws and regulations such as Title IX. The individual designated with responsibility for coordination of compliance efforts and receipt of inquiries concerning nondiscrimination policies is the University's Title IX Coordinator: the Director of the Office of Social Equity, titleix@valdosta.edu, 1208 N. Patterson St., Valdosta State University, Valdosta, Georgia 31698, 229-333-5463.

- Arrive on time. Attendance will be recorded in the first 10 minutes of the class. So, do not be late to class. In the event that a student misses a class with an excuse, s/he should email the instructor within 24 hours of the missed class. It is the instructor's prerogative to accept the excuse or not. Students are still responsible for all class content even if they received an excused absence.
- Cell phones are not allowed to be used in class.
- Email: Please email me only from a VSU email account. I am unable to respond to emails from non-VSU accounts.
-Academic integrity is the responsibility of all VSU faculty and students. Students are responsible for knowing and abiding by the Academic Integrity Policy as set forth in the Student Code of Conduct and the syllabus. All students are expected to do their own work and to uphold a high standard of academic ethics. Cheating (including plagiarism) will not be tolerated. The instructor reserves the right to dismiss you from the course without credit if you are caught cheating. You will be respectful of your instructor and your fellow students at all times, or you will be dismissed from the class and potentially the course.
 - No arguments on final grade. You can check any mistake in the calculation of your grade but no any other arguments.
9. Additional Information (at instructor's discretion)
   • Strategies used to support learning: Students should take advantage of my office hours. Studying as a group (study group) should be a good idea. However, you have to complete all term projects and take-home exams by yourself. If cheatings are found in your projects or take-home exams, all students involved will get a zero point in those assignments.
   • ***I will teach and you will learn a fascinating topic in biology, bioinformatics, in this course. Therefore, your intellectual enhancement from this course will depend on both of us. Would you have any other ideas?***