San José State University
Computer Science Department

Biology 221T, Advanced Bioinformatics for Biotechnology, Fall 2019

Course and Contact Information

Instructor:	William "Bill" Andreopoulos
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Office Hours:	Monday 12:00-13:00 pm and Wednesday 15:00-16:15
Class Days/Time:	Monday 6-9:30pm
Classroom:	DH 550

Interesting links

- An Introduction to the Double Helix.
- Transcription and Translation at myDNA.
- A Primer on Molecular Genetics from the U.S. Department of Energy.
- What are the next steps in genomic research? from Genetics Home Reference at NIH
- Cracking the Code of Life NOVA program. Requires Quick Time or Real Video Plug-in.
  Recommended segments: 1, 2, 6, 9, 10, 12, 13, 14, and 16.
  Link to biotechnology companies in the Bay Area.

Catalogue Description

Bioinformatics applications to solve advanced problems in molecular and cell biology.

Prerequisites

This course is offered to students enrolled in the Master of Biotechnology (MBT) program at San Jose State University. MBT offers an opportunity to develop a profession combining scientific interests with business and management principles relevant to the biotech industry.

Course Learning Outcomes (CLO)

Upon successful completion of this course, students will be able to:

1. Use case studies in in-class hands-on exercises to extract generalizable concepts.
2. Understand the nature, scope and limits of the field of bioinformatics.
3. Have a good familiarity with bioinformatics applications used for sequence alignment and gene expression analysis.
4. Know how bioinformatics can be used to answer biological questions and to generate biological hypotheses.
5. Possess a refined sense of the professional form of biomolecular information.
6. Acquaint students with some of the most challenging problems in life science and show how computer science can be used to solve some of these problems.

Required Texts/Readings

[Textbook Reading Guidelines](#) Last updated: August 16, 2016.

[Biology Terms](#)

Understanding Bioinformatics by Marketa Zvelebil and Jeremy Baum, Garland Science, 2008, ISBN 0-815-34024-9.

The book can be ordered through Amazon.

1. We shall cover most of the topics from chapters 1, 2, 3, 4 and 7.
2. Before reaching the end of a chapter, I will announce which topics of the following chapter will be covered.
3. A copy of my powerpoint slides (2 per page and 6 per page) will be available to the students enrolled in the class.

Handouts (through Canvas)

Course Requirements

SJSU classes are designed such that in order to be successful, it is expected that students will spend a minimum of forty-five hours for each unit of credit (normally three hours per unit per week), including preparing for class, participating in course activities, completing assignments, and so on.

1. **Hands-On Exercises**
   We will have a number of hands-on exercises. The purpose of the hands-on exercises is to develop your understanding of the material.

   Dual Role of the classroom, DH550: Lecture/Lab
   The classroom, DH550, is a dual purpose room. It can be a regular lecture room or it can be a computer laboratory.

   Lecture Mode: This is when DH550 is used as a regular lecture room. Students are expected to listen and follow the lecture. The classroom is noisy because of the large number of computers. Be considerate to your classmates and follow the lecture. Do not use the computer and/or talk to your neighbor.
   Lab Mode: This is when DH550 is used as a computer lab. Use the computers and share your ideas and solutions with your classmates.

   We shall alternate between the two modes. A typical class will begin with a short lecture (Lecture Mode) followed by a hands-on (Lab Mode).

2. **Term Project and In-Class Presentation:**
   There will be a term project. This is a group project. Each group consists of two students. Team Formation is due on Monday, September 16, 2019. The Progress Report is due on Monday, November 4, 2019, at the beginning of the lecture. The final project is due on Monday, December 2, 2019, at the beginning of the lecture. The in-class presentation will also take place on Monday, December 2, 2019.
3. **Exams:**
   Exam One: Monday, October 14, 2019.
   Exam Two: Monday, November 18, 2019.
   Final Exam: Monday, December 9, 2019.
   Exam One and Exam Two are each one hour and fifteen minutes long. All exams are in-class, closed-book and comprehensive. You will get back your exams within one week at which time we'll go over them in class. Exams will be collected and kept with me. There will be no make-up exams.

Piazza for Class Discussion

This term we will be using Piazza for class discussion. The system is highly catered to getting you help fast and efficiently from classmates and the instructor. Rather than emailing questions to the teaching staff, I encourage you to post your questions on Piazza. Find our class Piazza page on Canvas.

Determination of Grades

The course grade is based on:

Hands-On Exercises: 20%
Exam One: 20%
Exam Two: 20%
Project: 20%
Final: 20%

Grade	Points	Percentage
A plus	960 to 1000	96 to 100%
A	930 to 959	93 to 95%
A minus	900 to 929	90 to 92%
B plus	860 to 899	86 to 89 %
B	830 to 859	83 to 85%
B minus	800 to 829	80 to 82%
C plus	760 to 799	76 to 79%
C	730 to 759	73 to 75%
C minus	700 to 729	70 to 72%
D plus	660 to 699	66 to 69%
D	630 to 659	63 to 65%
D minus	600 to 629	60 to 62%

Class Attendance

Class attendance is strongly encouraged. In class, we shall cover many topics and examples that are neither in the class notes nor in the textbook. If you miss a lecture, it is your responsibility to find out what was covered in class (this includes: handouts given out during your absence, corrected typos and errors, examples discussed in class - that are neither in the book nor in the notes - clarifications and changes made to assignments or the project, etc...).

Classroom Protocol

Attendance is highly recommended. Please avoid disturbing the class: turn-off cell phones (or put them on silent or vibrate mode), no text messaging in class or during exams, **no taking pictures and video**, avoid coming late. You are not allowed to publically share or upload material for this course such as exam questions, lecture notes, or solutions without the instructor's consent.

Add/Drop Policy

For those wishing to add this course, the deadline is September 10, 2019. The last day to drop a course without a "W" grade is September 3, 2019. To drop after this date, a Late Drop petition will be required. According to University and Department guidelines, dropping after September 3, 2019, requires a serious and compelling reason to drop a course. Grades alone do not constitute a reason to drop a course. Students who stop attending without officially dropping will be issued a "U" at the end of the semester which is counted as an F in calculations of GPA.

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Refer to the current semester's Catalog Policies section at http://info.sjsu.edu/static/catalog/policies.html. Add/drop deadlines can be found on the current academic year calendars document on the Academic Calendars webpage at http://www.sjsu.edu/provost/services/academic_calendars/. The Late Drop Policy is available at http://www.sjsu.edu/aars/policies/latedrops/policy/. Students should be aware of the current deadlines and penalties for dropping classes. Information about the latest changes and news is available at the Advising Hub at http://www.sjsu.edu/advising/.

Consent for Recording of Class and Public Sharing of Instructor Material

University Policy S12-7, http://www.sjsu.edu/senate/docs/S12-7.pdf, requires students to obtain instructor's permission to record the course. Common courtesy and professional behavior dictate that you notify someone when you are recording him/her. You must obtain the instructor's permission to make audio or video recordings in this class. Such permission allows the recordings to be used for your private, study purposes only. The recordings are the intellectual property of the instructor; you have not been given any rights to reproduce or distribute the material.

Course material developed by the instructor is the intellectual property of the instructor and cannot be shared publicly without his/her approval. You may not publicly share or upload instructor generated material for this course such as exam questions, lecture notes, hands-on exercises or homework solutions without instructor consent.

Academic Integrity

Your commitment as a student to learning is evidenced by your enrollment at San Jose State University. The University Academic Integrity Policy S07-2 at http://www.sjsu.edu/senate/docs/S07-2.pdf requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The Student Conduct and Ethical Development website is available at http://www.sjsu.edu/studentconduct/. Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person's ideas without giving proper credit) will result in a failing grade and sanctions by the University. For this class, all assignments are to be completed by the individual student unless otherwise specified. If you would like to include your assignment or any material you have submitted, or plan to submit for another class, please note that SJSU's Academic Integrity Policy S07-2 requires approval of instructors.

- Anyone caught cheating (including copying the work of others) on any assignment in the class will receive a failing grade for the assignment, in addition to other sanctions that are permitted

by the University, including but not limited to the filing of a report with the Dean of Student Services and expulsion from the University.

Campus Policy in Compliance with the American Disabilities Act

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 at http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf requires that students with disabilities requesting accommodations must register with the Accessible Education Center (AEC) at http://www.sjsu.edu/aec to establish a record of their disability.

In 2013, the Disability Resource Center changed its name to be known as the Accessible Education Center, to incorporate a philosophy of accessible education for students with disabilities. The new name change reflects the broad scope of attention and support to SJSU students with disabilities and the University's continued advocacy and commitment to increasing accessibility and inclusivity on campus.

University Policies

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs' Syllabus Information [web page](http://www.sjsu.edu/gup/syllabusinfo/) at http://www.sjsu.edu/gup/syllabusinfo/