SYLLABUS

Semester: Fall 2023

Course Name: BIOL5356.001. Advanced Bioinformatics

Meeting time: M 1600-1850

Office Hours: M 1900-2000, T 1200-1600, or by appointment @S236

Instructor: Dr. Alexandra Martynova-Van Kley, Professor, Biology department,
📞 936 468 2569, ✉ avankley@sfasu.edu

WELCOME: This course is 3 semester hours. This course is 3 semester hours. The class meets face-to-face for approximate 3 hours of lecture each week with the expectation of at least 9 hours of additional out-of-class work per week. You may consider this as a part of your 150 asynchronous instructional minutes for this course. Course includes theory of computational methods to biological data analysis for discovery including Genomics, Proteomics, Transcriptomics. There will be two noncumulative exams for the first and the second part of the course. Context will include any material covered during lectures. Students will be required to complete an independent project upon completion of the course at the end of the term and present it to the class. Course prerequisites: graduate standing and permission of instructor, there is no corequisites. General Education Core Curriculum

Objectives/Outcomes: This course is not included in the general education core curriculum.

PROGRAM LEARNING OUTCOMES:
#1: The student will demonstrate a good knowledge base in biological concepts and be able to integrate knowledge with critical thinking skills to become problem solvers. Knowledge base will include: levels of complexity (molecular/cellular through population/communities/ecosystems), biological principles and processes.
#2: The student will clearly communicate scientific information; provide clear structure and transitions, incorporating substantial primary-literature-based supporting evidence; and demonstrate audience appropriate purpose, agenda, language, and style.
#3: The student will demonstrate an understanding of scientific methods and design small original scientific research project.

STUDENT LEARNING OUTCOMES:

Students who complete Advanced Bioinformatics will be able to:
1. Understand structure of databanks (GenBank, PDB) and retrieve needed data for genomic and proteomic research (PLO 1).
2. Demonstrate proper usage of online tools to analyze retrieved data (PLO 1, 2).
3. Discuss the contributions of bioinformatics to research efforts in their field of study (PLO 1, 2).

ATTENDANCE: You are expected to attend all lectures according to the schedule—attendance will be monitored. Sign in with your full first name and last name as listed on the class roster. Students who do not provide their full name will be marked as absent. Missing lecture classes without university approved absences will result in points subtraction from your Final grade. In contrast perfect attendance will give you extra points to your Final grade. Stay focused: turn off your cellphone and pack it away, be respectful to your classmates and the professor. Using a phone during the class without permission will be equal to an absence. Missing an exam will be permitted only by prior arrangement. If the exam was missed without prior arrangement as an after the fact make-up will be allowed only by Faculty Notification Requests. The information is located on the Dean of Student’s website: https://www.sfasu.edu/thehub/sos/notification-request

CLASS WEB-PAGE (also provided on class D2L “News”): https://martynova-vankley.com/courses/BIOL5356

To open COURSE PAGE slides & videos you need🔑: Username __________________ Password________________

MATERIALS: Students will work with the information/instructions provided online. PowerPoint presentations for each lecture will be online, according to the provided schedule of the course. Handmade notes 🖋 can be made and used during the exam. (REMEMBER: draw it to know it!) I recommend to use CHROME 🌐 to browse this page.

Textbook is optional for this course: Concepts in Bioinformatics and Genomics, by Jamil Momand et al.
**SCHEDULE** (tentative):

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<th>Week</th>
<th>Activity</th>
<th>Topics</th>
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<tr>
<td>1</td>
<td>M: In class</td>
<td>Class meeting</td>
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<td>2</td>
<td>M: In class</td>
<td>History of Bioinformatics</td>
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<td>M: In class</td>
<td>Flash talks</td>
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<td>4</td>
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<td>Sequence databases</td>
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<td>5</td>
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<td>Molecular evolution</td>
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<td>6</td>
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<td>Sequence alignment</td>
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<td>7</td>
<td>M: In class</td>
<td>BLAST</td>
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<td>8</td>
<td>M: On line, <a href="#">D2L Brightspace</a> October 6 at 4:00-5:00PM</td>
<td>Midterm, EXAM 1</td>
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<td>9</td>
<td>M: In class</td>
<td>Transcriptomics</td>
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<td>10</td>
<td>M: In class</td>
<td>Genomics</td>
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<td>Phylogenetics</td>
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<td>M: In class</td>
<td>Protein structure prediction. Proteomics</td>
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<td>Thanksgiving Break!!!</td>
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<td>M: TBA</td>
<td>Independent study/consultations</td>
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<td>M: In class</td>
<td>Students Presentations.</td>
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<td>16</td>
<td>M: On line, <a href="#">D2L Brightspace</a> - December 11 at 4:00-5:00PM</td>
<td>Final, Exam 2</td>
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**GRADING CRITERIA & COURSE REQUIREMENTS:**

- **Comprehensive Examinations:** There will be two noncumulative exams for the first and the second part of the course. Context will include any material covered during lectures and in class discussions. These exams will be of an objective or subjective format or combinations of both. These two lecture exams are worth 40 points each.

- **Lecture Quizzes:** Before each lecture there will be a short quiz which will cover the material learned since the previous quiz (required and recommended reading of materials available on-line). These quizzes will be a combination of multiple choice, matching, short answer. These lecture quizzes are worth 10 points all together.

- **Independent activities/Participation in discussions:** Students are expected to participate in weekly discussions on the assigned readings based on posted pdfs for that day. To facilitate discussion, each student is required to bring in at least five typed questions or short pptx presentation that they will submit before each class depending on that day assignment. The grade will be determined based on the frequency of their participation as well as thoughtfulness/utility of their contributions to class discussion. This is worth 10 points all together.

- **Independent project:** The students will conduct an independent lab-based research project in which they gather data, analyze it, and present their findings in a written paper following the standard scientific format (Abstract, Introduction, Materials and Methods, Results, and Discussion). The project will be worth of 50 points (written portion 20 points, presenting 30 points)

- **Other assignments:** as described at the beginning of the semester and required by the Professor.

In summary:

- **Two Exams** (all together) – 80 pts
- **Quizzes/independent activities/participation in discussions** – 20 pts
- **Independent project** – 50 pts
- **TOTAL - 150 pts**
COMUNICATION: over an e-mail avankley@sfasu.edu (please don't email through D2L). When emailing use your OFFICIAL SFA E-MAIL ADDRESS

E-mail rules:

1. Check your e-mail REGULARY and, if you have your SFA account forwarded to some secondary account, to be certain this is not full and can receive messages.
2. Always indicate BOTH class & section # and your CID in a subject line.
3. When ATTACHING a file, filename should be “First_LastName.ext”, it must also include your name in the document itself.
4. Emails lacking any of the information listed above WILL BE IGNORED.
5. Be courteous: Begin your email with a greeting that addresses your instructor respectfully and professionally, such as "Dear Dr. Smith" or "Hi Dr. Jones.”
6. E-mail should be considered a professional form of communication – you should use proper grammar and spelling.
7. CLOSE with your full name: after your message, end with a closing and signature, such as "Sincerely, Jane Doe” or “Thanks, John Doe.”
8. A RESPONSE may take time: I will try to get back quickly, but don’t expect a response within a few minutes. It can take up to 24 hours for an instructor to respond. If you need a response ON THE SAME DAY, your best option is to attend the office hours.
9. NO emails will be answered after 5 p.m. and/or during weekends or holidays.
10. NO GRADE DISCUSSION over an e-mail, only during one-on-one meetings. Grades cannot be discussed via e-mail at any time due to federal law, I will speak to you in person instead during my office hours. DO NOT involve a third-party who is not affiliated in an official capacity with SFASU (e.g., friend, roommate) in any matters pertaining to your enrollment in this course. Your instructor is legally prohibited from discussing most course/grade-related issues with third parties according to the Family Educational Rights and Privacy Act (FERPA) (20 U.S.C. § 1232g; 34 CFR Part 99).

CLASS DISRUPTION: Class disruptions will not be tolerated because they detract from other students’ learning. As adults, students should be able to sit through class without disturbing others. The professor does NOT necessarily give you a warning or make an announcement that you are disrupting class. Instead, points will simply be deducted in the grade book. Students are free to inquire at any time whether they have had points deducted during office hours. Tardiness to lecture will not be tolerated; it disrupts the lesson and the concentration of fellow students. Reasonable accommodations will be made in cases of emergency situations if documentation is provided. It is the student’s responsibility to provide the instructor with documentation of emergencies. Sleeping during class can be distracting to other students and the instructor. If a student is so tired that they cannot stay awake for a lecture, as boring as it may be, the student should not be in class. Cell phones must be turned off during lecture and packed away. In cases of family emergency, the student must inform the instructor of the situation BEFORE class begins. There should be no texting in class. Texting may distract other students and the instructor. Leaving class is disruptive to other students who are trying to pay attention. Leaving the class for any reason will count against you. Hence, be sure to use the restroom before coming to class (a 5-minute break is given during lecture during the long summer lectures). If a student knows they will need to leave class early, notify the instructor well ahead of time. Points will not be deducted if the student has a legitimate excuse for leaving early.

Talking/Disruptive Behaviors: the professor is highly encourages students to ask questions or make relevant comments during a lecture. However, talking to a neighbor or other disruptive behaviors will not be tolerated because, again, it disrupts the learning environment of other students. Laptop computers are not allowed in lecture. In the past, too many students have used them for surfing the internet or working on other projects during lecture, which distracts other students.

MENTAL HEALTH: SFASU values students’ mental health and the role it plays in academic and overall student success. SFA provides a variety of resources to support students mental health and wellness. Many of these resources are free, and all of them are confidential.

FACULTY NOTIFICATION REQUESTS: Please read at https://www.sfasu.edu/thehub/sos/notification-request.

ACADEMIC INTEGRITY: Please read the complete policy at https://www.sfasu.edu/docs/policies/10.4.pdf.

STUDENTS WITH DISABILITIES: To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to http://www.sfasu.edu/disabilityservices/.
WITHHELD GRADES SEMESTER GRADES POLICY (5.5): Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average.

On-campus Resources:
SFA Counseling Services [https://www.sfasu.edu/humanservices/clinics-labs/counseling-clinic](https://www.sfasu.edu/humanservices/clinics-labs/counseling-clinic)

Rusk Building, 3rd Floor 936.468.2401
SFA Human Services Counseling Clinic
[www.sfasu.edu/humanservices/139.asp](https://www.sfasu.edu/humanservices/139.asp)
Human Services, Room 202 936.468.1041
Crisis Resources: Burke 24-hour crisis line: 1.800.392.8343
Suicide Prevention Lifeline: 1.800.273.TALK (8255) Crisis Text Line: Text HELLO to 741-741