Master Course Syllabus

For additional course information, including prerequisites, corequisites, and course fees, please refer to the Catalog: https://catalog.uvu.edu/

Semester: Spring
Year: 2025
Course Prefix: BIOL
Course and Section #: 4600-001
Course Title: Bioinformatics Capstone
Credits: 3

Course Description

Applies concepts from the previous Bioinformatics sequence of courses to the real world. Allows students to work with faculty members and industry experts to design and complete a project that incorporates various concepts that have been presented in previous Bioinformatics courses. Requires development and/or application of bioinformatic tools and presentation of results.

Course Attributes

This course has the following attributes:

☐ General Education Requirements
☐ Global/Intercultural Graduation Requirements
☐ Writing Enriched Graduation Requirements
☒ Discipline Core Requirements in Program
☐ Elective Core Requirements in Program
☐ Open Elective

Other: *Click here to enter text.*

Instructor Information

Instructor Name: Carl E. Hjelmen

Student Learning Outcomes

1. Interpret bioinformatic problems within the framework of core bioinformatics concepts.
2. Critique existing bioinformatic pipelines and tools.
3. Create solutions to bioinformatics problems with existing or new tools.
4. Develop reproducible pipelines capable of successfully addressing chosen solutions.
5. Present fully-reproducible reports of bioinformatic analyses.

Course Materials and Texts

No Required text or materials

Course Requirements

Course Assignments, Assessments, and Grading Policy

Assignments and Project Descriptions

Attendance (10%)

This course is based on applying skills and knowledge gained from your previous courses. It is imperative that work be completed and discussed. Therefore, it is expected students attend the set meeting times to dedicate time to their project and the relevant readings and discussion. The professor will be available to aid in troubleshooting code, discussing applications, and explaining key concepts and background relevant to independent projects.

Assignments/Goals (30%)

We are focusing on the application of skills and utilization of tools related to bioinformatic pipelines. As projects are independent, there are not set assignments universal for all students, rather weekly goals that should be completed related to the project at hand. Additional readings and discussions may be assigned based on the nature of the goals and application of analysis to the study. Goals will be established in class and confirmed via Teams message or email.

Reproducible Code on GitHub (30%)

In bioinformatics, it is imperative to be open about the code and analyses we use to investigate data. To address and encourage this, students will be required to upload completed code to a public GitHub repository to maintain transparency and accessibility. This must be completed by the end of the semester for instructor to investigate the functionality of the code.

Presentation of data and analysis (30%)

The ability to communicate science is imperative. In order to complete this course, the student must present their project outcomes and code. This can be completed through a presentation to the class or at an outside venue (University, Region, National, or International conference). This presentation must cover relevant background on the project, its applicability to the broader scientific community, the relevant programs and functions utilized, and an interpretation of the data.

Required or Recommended Reading Assignments

None

General Description of the Subject Matter of Each Lecture or Discussion

Varies by Student Project

Required Course Syllabus Statements

Generative AI

Artificial intelligence (AI) is becoming an ever-prevalent tool in society, and it is important to understand how this tool works. It is important to recognize this as a "tool" and not a "crutch". AI is prone to "hallucinating" and giving incorrect or false results; it also does not allow me to gauge **your understanding** of material. I encourage use of all resources for your work but ask that you make it your own and that you do not ask AI to complete your assignments for you. If you utilize AI, be sure to indicate it in your response that you used AI and indicate how you corrected the response and made it your own. If I feel you are not adequately responding or that you are relying on AI too much, I reserve the right to remove points on responses, up to zero credit.

Using Remote Testing Software

☒ This course does not use remote testing software.

☐ This course uses remote testing software. Remote test-takers may choose their remote testing locations. Please note, however, that the testing software used for this may conduct a brief scan of remote test-takers' immediate surroundings, may require use of a webcam while taking an exam, may require the microphone be on while taking an exam, or may require other practices to confirm academic honesty. Test-takers therefore shall have no expectation of privacy in their test-taking location during, or immediately preceding, remote testing. If a student strongly objects to using test-taking software, the student should contact the instructor at the beginning of the semester to determine whether alternative testing arrangements are feasible. Alternatives are not guaranteed.

Required University Syllabus Statements

Accommodations/Students with Disabilities

Students needing accommodations due to a permanent or temporary disability, pregnancy or pregnancy-related conditions may contact UVU Accessibility Services at accessibilityservices@uvu.edu or 801-863-8747.

Accessibility Services is located on the Orem Campus in BA 110.

Deaf/Hard of Hearing students requesting ASL interpreters or transcribers can contact Accessibility Services to set up accommodations. Deaf/Hard of Hearing services can be contacted at DHHservices@uvu.edu

DHH is located on the Orem Campus in BA 112.

Academic Integrity

At Utah Valley University, faculty and students operate in an atmosphere of mutual trust. Maintaining an atmosphere of academic integrity allows for free exchange of ideas and enables all members of the community to achieve their highest potential. Our goal is to foster an intellectual atmosphere that produces scholars of integrity and imaginative thought. In all academic work, the ideas and contributions of others must be appropriately acknowledged and UVU students are expected to produce their own original academic work.

Faculty and students share the responsibility of ensuring the honesty and fairness of the intellectual environment at UVU. Students have a responsibility to promote academic integrity at the university by not participating in or facilitating others' participation in any act of academic dishonesty. As members of the academic community, students must become familiar with their rights and responsibilities. In each course, they are responsible for knowing the requirements and restrictions regarding research and writing, assessments, collaborative work, the use of study aids, the appropriateness of assistance, and other issues. Likewise, instructors are responsible to clearly state expectations and model best practices.

Further information on what constitutes academic dishonesty is detailed in UVU Policy 541: *Student Code of Conduct*.

Equity and Title IX

Utah Valley University does not discriminate on the basis of race, color, religion, national origin, sex, sexual orientation, gender identity, gender expression, age (40 and over), disability, veteran status, pregnancy, childbirth, or pregnancy-related conditions, citizenship, genetic information, or other basis protected by applicable law, including Title IX and 34 C.F.R. Part 106, in employment, treatment, admission, access to educational programs and activities, or other University benefits or services. Inquiries about nondiscrimination at UVU may be directed to the U.S. Department of Education's Office for Civil Rights or UVU's Title IX Coordinator at 801-863-7999 – TitleIX@uvu.edu – 800 W University Pkwy, Orem, 84058, Suite BA 203.

Religious Accommodation

UVU values and acknowledges the array of worldviews, faiths, and religions represented in our student body, and as such provides supportive accommodations for students. Religious belief or conscience broadly includes religious, non-religious, theistic, or non-theistic moral or ethical beliefs as well as participation in religious holidays, observances, or activities. Accommodations may include scheduling or due-date modifications or make-up assignments for missed class work.

To seek a religious accommodation, a student must provide written notice to the instructor and the Director of Accessibility Services at accessibilityservices@uvu.edu. If the accommodation relates to a scheduling conflict, the notice should include the date, time, and brief description of the difficulty posed by the conflict. Such requests should be made as soon as the student is aware of the prospective scheduling conflict.

While religious expression is welcome throughout campus, UVU also has a specially dedicated space for meditation, prayer, reflection, or other forms of religious expression.