BIOL 5153: Practical Programming for Biologists

Spring 2026 Syllabus

Instructor

Dr. Andrew Alverson, Department of Biological Sciences: aja@uark.edu

Course delivery

Live class meetings will take place MW 9:40 – 10:55 AM in SCEN 606. Course content is available on GitHub.

Office Hours

Send an email to set up an in-person or Zoom meeting.

Disclaimer

The information contained in this syllabus does not constitute a contractual agreement. The course content and grading policy may be changed at the discretion of the instructor. All assigned work is required of each student.

Purpose of the course

As vast amounts of genomic and other biological data accumulate, biologists require the skills to manipulate and analyze large datasets in an efficient way. This course will provide hands-on instruction on the fundamentals of biological computing. Although most examples center around the analysis of genomic data, the skills taught in this course can be applied to any dataset, biological or otherwise. Students will learn how to: - use a Unix- or Linux-based work station, - navigate and work from the command line, - archive and document one's work with version control software - learn how to program in Python, a popular scripting language for biological applications

Grade componenets

Item	Percent
Exercises/assignments	60%
DataCamp assignments	40%

Letter grades will be based on the following scale:

- A >= 90%
- B >= 80%
- C >= 70%
- D >= 60%
- F <= 60%

No extra credit points will be available. **Under no circumstances will any grade be altered for any reason except in the case of a grading error.** You have exactly 7 days from the time the work was returned to request a re-evaluation. At that point, the entire quiz/lab/assignment will be re-graded. Mistakes will be corrected, including any that could result in a net decrease in your grade.

Optional texts

- *Practical Computing for Biologists* by Haddock and Dunn (ISBN: 978-0878933914)
- *Bioinformatics Data Skills: Reproducible and Robust Research with Open Source Tools* by Vince Buffalo (ISBN: 978-1-4493-6737-4)
- *Bioinformatics Programming Using Python* by Mitchell Model (ISBN: 978-0596154509)
- *Learning Python* by Mark Lutz (ISBN: 978-1449355739)

Each of these books has its strengths and weaknesses, and no single book overlaps perfectly with the content of this course. In addition, there are lots of web resources available for all the topics we'll be covering.

University policies and calendar

Please review carefully the official university calendar for important dates

Academic Honesty

Academic dishonesty includes any effort to circumvent the evaluation procedures of the course to improve a grade for yourself or other students (cheating). Cheating includes but is not limited to unauthorized examination of written materials (e.g., notes, neighbor's paper) during an exam or quiz, misrepresentation of the cause of an absence during an exam, submitting the work of another (partially or entirely) as ones own, and alteration of an assignment or quiz to be submitted for re-grading. You are encouraged to report academic dishonesty. Anonymity will be protected if requested. There is no excuse for academic dishonesty, so if we believe that a student has cheated, and we have any supporting evidence, we will report the accusation and the evidence to the Office of Judicial Affairs immediately, with the recommendation of an **F** grade in the course. If you have any questions of what constitutes academic dishonesty, please ask us or refer to the brochure entitled *Academic Honesty* available from the division of Student Services: https://honesty.uark.edu/policy/

Each University of Arkansas student is required to be familiar with and abide by the University's Academic Integrity Policy, which may be found here. Students with questions about how these policies apply to a particular course or assignment should contact their instructor immediately.

Students with Disabilities

University of Arkansas Academic Policy 1520.10 requires that students with disabilities are provided reasonable accommodations to ensure their equal access to course content. If you have a documented disability and require accommodations, contact the instructor privately within two weeks of the beginning of the semester to make arrangements for necessary classroom adjustments. You must first verify your eligibility for these through the Center for Educational Access Room 104 in the Arkansas Union. Contact 479–575–3104 or visit https://cea.uark.edu/ for more information on registration procedures.

Emergency Preparedness

Many types of emergencies can occur on campus; instructions for specific emergencies such as severe weather, active shooter, or fire can be found at https://safety.uark.edu/emergency-preparedness/

Violence / Active Shooter (Think 'CADD')

- **CALL:** 9-1-1
- **AVOID:** If possible, self-evacuate to a safe area outside the building. Follow directions of police officers.
- **DENY:** Barricade the door with desk, chairs, bookcases or any items. Move to a place inside the room where you are not visible. Turn off the lights and remain quiet. Remain there until told by police it is safe.
- **DEFEND:** Use chairs, desks, cell phones or whatever is immediately available to distract and/or defend yourself and others from attack.

Inclement Weather Policy

When the University has officially canceled classes because of inclement weather this class will not meet. For information regarding whether the university is closed for any reason use the following sources:

- See the inclement weather web site at https://safety.uark.edu/inclement-weather/
- Call 479-575-7000 or university switchboard at 575-2000 for recorded announcements about closings
- Listen to KUAF Radio (91.3 FM) or other local radio and TV stations for announcements.

Tape-recording and/or any Other Form of Electronic Capturing

Tape-recording and/or any other form of electronic capturing of lectures is expressly forbidden. State common law and federal copyright law protect my syllabus and lectures. They are my own original expression and I often record my lectures at the same time that I deliver them in order to secure protection. Whereas you are authorized to take notes in class thereby creating a derivative work from my lecture, the authorization extends only to making one set of notes for your own personal use and no other use. You are not authorized to record lectures, to provide your notes to anyone else, or to make any commercial use of them without express prior permission from the instructors.

Persons authorized to take notes for the Center for Educational Access, for the benefit of students registered with the Center, will be permitted to do so, but such use still is limited to personal, non-commercial use. Similarly, you are permitted to reproduce notes for a student in this class who has missed class due to authorized travel, absence due to illness, etc. However, to be clear, any class notes must not be sold or made available for any commercial use.

Recorded lectures will be available on Blackboard for viewing or downloading. You may not under any circumstance share these videos or post them, including abbreviated clips of these videos, on the internet, including social media.

Sale or Electronic Distribution of Class Notes

There are companies that will try to lure you into selling the notes you take in this class. Don't let these companies take advantage of you. Selling class notes, exams, or exam-related content to any commercial service is a violation of the instructor's intellectual property rights and/or copyright law as well as a violation of the U of A's academic integrity policy. Continued enrollment in this class signifies intent to abide by this policy.