

**Genomics Analysis
Bi 610 Winter 2019
Tentative Syllabus**

General Course Information

Instructors:

Dr. Leslie Coonrod

coonrod@uoregon.edu

Office hours: By appointment

Peter Batzel

pbatzel@uoregon.edu

Class meetings:

TH	12:30 PM – 2:00 PM	PSC B040
F	10:00 AM – 10:50 AM	PSC B040

Course goals:

- Design and communicate workflow of an analysis pipeline in a team setting
- Analyze data by writing original scripts and utilizing appropriate software tools
- Visualize data and draw conclusions using statistical evidence
- Demonstrate proficiency at reading and discussing primary research literature
- Create a clear and visually pleasing poster that adequately describes the research project

Course Organization

Group project: You will be assigned to a group to work on a real life™ project. Each group will have an advisor who was involved in designing the experiment/generating the data. Projects will include the following:

Progress report: In a 5-10 minute chalk talk, report your progress to the class, with the purpose of receiving feedback.

Poster: Groups will create a poster on their projects to present at the Genomics in Action meeting. Draft due January 23, posters will be printed the week of the meeting.

Deliverable: Sum up your work on the project for your PIs and create a deliverable that includes all necessary details.

Assignments, quizzes: During the course of the class, you will have several in class and out of class assignments and quizzes.

Journal club: Journal club-style presentations on student selected papers will be held throughout the term. See last page of syllabus for more info.

Class participation: Students are expected to ask questions during lecture, take part in class discussion, and participate in all labs.

Student Resources

DISABILITY: Any student with a documented disability, who may anticipate needing accommodations in this course, should arrange to meet with Leslie during the first week of class. Please request that a counselor at the Accessible Education Center send a letter verifying the disability. The Accessible Education Center is located in room 164 Oregon Hall and can be reached by e-mail: uoaec@uoregon.edu, and phone: 346-1155.

STUDENT LIFE: If you need help and are not sure where to go, check out the **Office of Student Life**. The student life staff is dedicated to helping students have the most successful experience they can while studying at the University of Oregon. The Office of Student Life staff is available to help you find solutions and resources to most issues and concerns on a drop-in basis Monday–Friday, 8:00 a.m.–noon and 1:00–5:00 p.m. In emergencies after hours and on weekends, contact the Department of Public Safety at 346-5444 and have an on-duty staff member paged. The Office of Student Life is located in room 164 Oregon Hall; phone: 346-3216; e-mail: stl@uoregon.edu.

UNIVERISTY OF OREGON CRISIS CENTER: is a student-funded organization that provides students with confidential telephone crisis intervention 24 hours a day, 7 days a week. The hotline number is 346-4488. *“Often students believe that their issues are not “severe” enough for them to call a crisis intervention hotline. Here at the Crisis Center, we truly believe that there is no problem too small for us. At one time or another everyone needs a little help through a difficulty personal situation.”*

DUTY TO REPORT: UO is committed to providing an environment free of all forms of prohibited discrimination and sexual harassment, including sexual assault, domestic and dating violence and gender-based stalking. Any UO employee who becomes aware that such behavior is occurring has a duty to report that information to their supervisor or the Office of Affirmative Action and Equal Opportunity. The UO Health Center and University Counseling and Testing Center can provide assistance and have a greater ability to work confidentially with students. All UO employees are also required to report to appropriate authorities when they have reasonable cause to believe that any child with whom they come in contact has suffered abuse or any person with whom they come in contact has abused a child.

ACADEMIC INTEGRITY: You are expected to do your own work on homework, proposals, and exams. You are encouraged to discuss ideas with each other and to study together, but don’t copy someone else’s work and don’t allow someone else to copy your work. All students are expected to conform to the student conduct code (can be found online at <http://uodos.uoregon.edu/StudentConductandCommunityStandards/StudentConductCode/tabid/69/Default.aspx>); students not in compliance will be brought to the attention of the university.

Tentative Fall 2016 Schedule

Schedule		Topic	
Week 1	Tues, Jan 8 Thurs, Jan 10 Fri, Jan 11	Project updates Single-cell RNA-seq Poster workshop	
Week 2	Tues, Jan 15 Thurs, Jan 17 Fri, Jan 18	Journal club 1 & 2 Databases Journal club 3	
Week 3	Tues, Jan 22 Thurs, Jan 24 Fri, Jan 25	Journal club 4 & 5 Poster review workshop Open lab (poster)	
Week 4	Tues, Jan 29 Thurs, Jan 31 Fri, Feb 1	Poster presentation workshop NO CLASS – UCSC Genome Browser workshop NO CLASS – GENOMICS <i>in ACTION</i>	
Week 5	Tues, Feb 5 Thurs, Feb 7 Fri, Feb 8	Python libraries Journal club 6 & 7 TBD	Zach Sailor
Week 6	Tues, Feb 12 Thurs, Feb 14 Fri, Feb 15	Journal club 8 & 9 Alternative splicing algorithm Alternative splicing algorithm	
Week 7	Tues, Feb 19 Thurs, Feb 21 Fri, Feb 22	Journal club 10 & 11 Proposal workshop Journal club 12	
Week 8	Tues, Feb 26 Thurs, Feb 28 Fri, Mar 1	Journal club 13 & 14 Proposal workshop 2 Journal club 15	
Week 9	Tues, Mar 5 Thurs, Mar 7 Fri, Mar 8	Journal club 16 & 17 Machine learning and metagenomics ML and metagenomics cont'	Clay Small Clay Small
Week 10	Tues, Mar 12 Thurs, Mar 14 Fri, Mar 15	Journal club 18 & 19 ATAC seq Journal club 20	
FINALS WEEK	TBD	Proposal talks	

Journal Club Schedule

Purpose:

The goal of this assignment is to help you practice the following skills that are essential to your success in this course and your future career in bioinformatics.

- **Choose a relevant paper** with potential for generating discussion
- Interpret scientific literature
- Distill key points from paper
- Evaluate conclusions drawn by authors by analyzing presented data
- Distinguish quality of literature
- Facilitate meaningful discussion of literature

The presentation should include:

You should prepare a 30-minute presentation. You should thoroughly read and analyze the paper, including any supplemental materials, and be able to answer questions from your peers.

The presentation should include:

- **Introduction** – include sufficient background to understand the significance, justification, and goals of the work.
- **Results** – present the data and interpretation. Additional figures may be shown to assist in understanding the experimental design and interpretation of the data. Not every figure in the paper needs to be included.
- **Conclusions and Future Directions** – summarize the main findings and discuss future work that will further answer the questions posed by the work.
- **Discussion** – presenters should facilitate discussion of the paper.

Participation:

Students not presenting the paper are expected to contribute to the discussion by asking thoughtful questions or responding to presenter questions.

Executive Summary:

We will **not** require executive summaries as long as the quality of the discussion remains high. However, we still suggest you think about the following questions to prepare you to be an active participant in the discussion.

1. Overview
 - i. What is the main idea that the authors would like to convey?
 - ii. Were they successful? (e.g. Were the data sufficient? Did they over-interpret their results?)
 - iii. Was there a clearly stated hypothesis?
2. The data
 - i. Are the data reproducible and/or accessible?
 - ii. Were sufficient controls employed (if applicable)?
3. Were the methods appropriate to address the authors' questions?
4. Were there experiments or analyses they didn't do that could make the data more convincing?
5. Did the authors' increase confidence in the outcome by supporting their results in multiple ways?
6. What are the general impacts of the paper, based on what others have published?
7. Is the bibliography high quality?
8. What is one question you have about the paper?