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Genomics Research Lab – Tentative Syllabus

Bi 624 Fall 2019

General Course Information

Instructors

Co-instructor	Co-instructor	TA	
Dr. Leslie Coonrod	Dr. Clay Small	Jason Sydes	Pete
coonrod@uoregon.edu	csmall@uoregon.edu	sydes@uoregon.edu	pbat

Class Meetings		
Tue, Thur	12:30 PM - 1:50 PM	Sci Lib B042
Friday	10 AM - 10:50 AM	Sci Lib B042

Course Goals

- Design and communicate workflow of an analysis pipeline in a team setting
- Report quality of NGS (next generation sequencing) data

- Implement and evaluate quality filtering of NGS data
- Convey experimental plan and biological problem to both lay and technical audiences
- 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

Course Organization

- **Group project** (40% of grade): You will be assigned to a group to work on a real life™ project. Each group will have an mentor who was involved in designing the experiment/generating the data. Projects will include the following:
 - **Bibliography:** You will be assigned relevant papers to your project. From there, you will search the literature and develop a bibliography for the project.
 - **Background/strategy presentations:** In a 15 minute talk, concisely state the background, significance, and goals of the project. Outline the general strategy you plan to take.
 - **Layperson talks:** In a 10-12 minute talk, communicate the relevance and goals of the project to a non-technical audience. These are formal in nature.
 - **Progress reports:** In a 12-15 minute talk, report your progress to the class, with the purpose of receiving feedback.
 - **Final presentations:** In a 20 minute talk, communicate the background/introduction, results, conclusions, and future directions of the project. This should be a polished talk. Presentations will be judged based on clarity, quality of analysis, use of appropriate tools, drawing reasonable conclusions, data visualization and interpretation.
- **Assignments, quizzes** (40% of grade): During the course of the class, you will have several in class and out of class assignments and quizzes.
- **Journal Club** (15% of grade): Journal club group presentations on assigned papers will be held throughout the term.
 - **Group Presentation** (5% of grade) See Journal club guidelines.

- **Executive Summaries** (10% of grade) See executive summary guidelines. Students do not submit executive summaries when presenting.
- **Class participation** (5% of grade): Students are expected to actively participate in class discussion. Attendance alone is not enough to receive full credit.

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Schedule

Week	Day	Topic	Assignments Due
1	Tues, Oct 1	Course introduction, groups assigned	Project Choice
	Thur, Oct 3	RNA-Seq Quality Assessment Assignment	
	Fri, Oct 4	Trivia	
2	Tues, Oct 8	Project Background/Strategy talks	Index Hopping peer reviews
	Thur, Oct 10	Project Background/Strategy talks	RNA-Seq QAA
	Fri, Oct 11	Journal Club – Group 4	Exec Summ 1

3	Tues, Oct 15	Intermediate Talapas Usage - Nick	
	Thur.	GitHub for projects - Data	

Week	Day	Topic	Assignments Due
	Fri, Oct 18	Journal Club – Group 1	Exec Summ 2
4	Tues, Oct 22	Hypothesis testing	
	Thur, Oct 24	Differential Expression Analysis	
	Fri, Oct 25	Journal Club – Group 3	Exec Summ 3
5	Tues, Oct 29	Project Updates	
	Thur, Oct 31	Project Updates, library refresher	
	Fri, Nov 1	Journal Club – Group 5	Exec Summ 4
6	Tues, Nov 5	Deduper	
	Thur, Nov 7	Deduper + IGV workshop	
	Fri, Nov 8	Journal Club – Group 2	Exec Summ 5
7	Tues, Nov 12	scRNA-seq	
	Thur, Nov 14	scRNA-seq	
	Fri, Nov 15	Journal Club – Group 6	Exec Summ 6

8	Tues, Nov 19	Layperson Talks	
	Thur.		

Week	Day	Layperson Talks Topic	Assignments Due
	Fri, Nov 22	Journal Club – Group 7	Exec Summ 7
9	Tues, Nov 26	Genomes assembly + BUSCO	
	Thur, Nov 28	No class - Thanksgiving	
	Fri, Nov 29	No class - Thanksgiving	
10	Tues, Dec 3	Object Oriented Programming	
	Thur, Dec 5	SQL	
	Fri, Dec 6	SQL lab	
Final Exam	TBD	Final Project Presentations	