DRAFT Syllabus

FRS 002 032: Spring 2015

1350 Storer Hall

93 Hutchinson

This document is subject to MAJOR changes; this class is a work in progress!

Instructor Pool

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Office hours

By appointment – please email to schedule.

Required Course Material

Laptop or tablet, which can access Google Docs in class. Please let us know if this might be a problem, we will work to make accommodations.

Class times and location

Tuesdays 3:10 PM - 5 PM
FRS 002, Section 032, CRN #34946
This class is "hidden" on Schedule Builder you need this CRN to find it and register
This class is 2 units, graded

Title: Course-based Research Experience: antibiotic resistance in KOALA POO microbes.

Description: UC Davis researchers are currently investigating the effects of antibiotic treatments on endangered koalas. Students in this class will contribute to the project by isolating and characterizing the koala gut bacteria, focusing on those that metabolize tannins. These special bacteria may be critical for koalas' digestion process. Using genetic analysis techniques, students will broadly identify these bacteria, examine similar bacteria's published genomes, form hypothesis about these bacteria's antibiotic susceptibility and will finally have an opportunity to test the various susceptibility in the lab. Findings from this class may be included in a future scientific publication. Using genetic data generated from UC Davis research on the koala microbiome, students will be introduced to bacterial genetics, basic microbiology, experimental design, next-generation sequencing, and genome annotation.

Seminar Goals (1) Student will have a hands-on opportunity to participate in a novel research project. (2) Students will be exposed to the process of research, its challenges, and unexpected outcomes. (3) Students will gain technical experience with: bacterial isolation and culture, PCR, Sanger sequencing, phylogenetic tree building, genome annotation analysis, antibiotic sensitivity assays, and (potentially)

scientific publication. (4) Students will better understand what it means to be a scientist and will more strongly identify as scientists

Course Format: The seminar will meet for 2 hours each week for ten weeks. Sessions will take place in a molecular biology lab and a computer lab.

Assignment Overview:

1. Students will summarize their work over the quarter with a short literature review, parts of which may be included in a future peer-reviewed publication. Students, whose work is of satisfactory quality, may be acknowledged in this future paper.
2. Pairs of students will draft, edit and submit a blog post for microBE.net about the week. The blog post will update microBE.net audience about progress of the class. The blog will also function as a sounding board for the students to post questions and ideas to the community as issues may arise in the class. Students will both learn about communicating science effectively and will have an opportunity to explore the online science community.
3. Weekly assignments include: (1) preparatory reading from primary literature, popular science article or YouTube, followed by a short answer questionnaire via Google Forms, due Monday night before class. (2) online lab notebook record keeping, which will include pictures and descriptions/log of in-class (and out of class) work as exemplified by well-written student lab notebooks. (3) 1-page Post-Class Reflections, due by Friday after class, students will mentally revisit the topics covered in class to process content and expose gaps in understanding. (4) In-Class participation will be accounted for by data/file entry and uploads into shared Google Drive.

Grading

Assignment (Expected Out-Of-Class work): Percentage of grade
****40 hours of outside work over 10-week quarter.*
Percentages required to earn specific letter grades: 100-90 (A+ to A-), 89-80 (B+ to B-), 79-70 (C+ to C-), 69-60 (D+ to D-), <60

- Weekly Pre-Class Reading assignments (1 hour/week): 10%
- Weekly Lab Notebook (0.5 hours/week): 10%
- Weekly Post-class 1-page reflection journal (1 hour/week): 10%
- microBE.net Blog Post (5 hours): 20%
- Term Paper, literature review - 3 pages with at least 10 references (10 hours) 20%
- Weekly Participation, Data entry and/or file uploads to shared Google Drive (In-Class): 30%

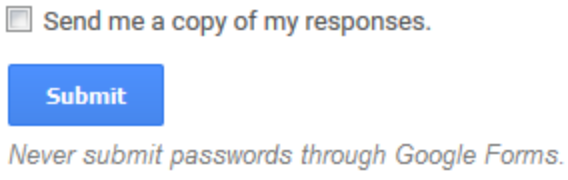
Assignments

Grading Details

- You will have an opportunity to **earn up to 1000 points** throughout this class. You are responsible for summing your points in this class and tracking your grade.
- If you are suspected to have cheated on any course assignment, you will be sent to SJA and given a 0 on the assignment.
- Encouraged collaboration does not mean that sharing language is okay. In classes where you are encouraged to work together, you still have to be careful when submitting individual assignments. Work that is too similar sends up red flags to UC Davis graders! A way to approach this challenge is to outline and research elements of an assignment with your classmate but then do the write-up separately. This strategy will ensure that your submissions look appropriately different. Academic integrity is a critical part of good research, that's a primary reason that UC Davis is so concerned about plagiarism. It's important that this principal is upheld by student and faculty alike!
- The Google Forms we use in this class require that you are logged into your UC Davis account. The most common form access problem happens when you have two Google/Gmail accounts open. Make sure all non-UC Davis Google accounts are closed before you try to use this form!!!! **Access will NOT be granted to those who request it from non-UC Davis emails/accounts.**

- **All participation based grades for at-home group work will be based on the Google Docs Revision History. Ensure that you are properly logged into your Google Account when contributing to group work.**

- **You must take keep a record of all your Google Form Submissions**, in the event that something gets lost in cyber space. You may do so by taking screenshots (that include date/time) or by using the "Send me a copy of my response" button (this generates an email receipt). This is generally good practice for all your classes that require online assignment submissions.



- No excused absences for brief (1 week) illnesses or family emergencies

****If you have a serious/prolonged (>2 weeks) medical or family situation, contact Ashley ASAP to make appropriate arrangements.*

- **Electronic Etiquette:** Please do not use your personal electronic devices in class unless asked to do so.
- UC Davis is committed to providing reasonable accommodations for all persons with disabilities. Participants who need accommodations must register with the Student Disability Center (54 Cowell Building, phone: (530) 752-3184) and then discuss accommodations with the instructor within the first week of the quarter.

Disclosure: This class is new and is quickly evolving! Things will NOT go as planned! Be prepared for changes to this syllabus as we make adjustments. We want you to have the best possible experience – help us out by providing feedback. You part of the creation of a new class here at UC Davis! It's great to have you on board. The overarching theme for the quarter is to stay flexible and have fun!

See following page for Course Schedule and Point Breakdown

	Item	Description	# Items/Quarter	Point Value/Item	Total Points/Quarter	Percentage of final grade
1	Pre-Class Reading Accountability Questionnaire (weekly)	Weekly preparatory reading from primary literature, popular science articles or YouTube, followed by a short answer questionnaire via Google Forms. **Due Monday night before clas**s.	10	10	100	10%
2	Online Lab Note Book Entry	Enter notes, pictures, description of in-class (and out of class) work as exemplified by well-written student lab notebooks.	10	10	100	10%
3	In-Class participation on Google Drive	Daily contribution to shared spreadsheet or folder compiling work or files generated in that day's class period. Serves as Attendance/Participation accountability.	10	30	300	30%
4	Post-class Reflection Journal	Prompt will be issued at the end of class and students will reflect 1 page each day after class. **Due by Friday (5 PM) after class**. Students will keep these documents in the Google Drive. These are very informal. May have a personal journal tone. The goal is for students to process, think and revisit the topics covered in class.	10	10	100	10%
5	Microbe.net Blog Post	Pairs of students will draft, edit and submit a blog post for microBE.net about the week. Each student pair will be assigned to one of the 10 weeks of the	1	200	200	20%

		quarter. The blog post will update microBE.net audience about progress of the class. The blog will also function as a sounding board for the students to post questions and ideas to the community as issues may arise in the class. Students will both learn about to communicating science effectively and will have an opportunity to explore the online science community.				
6	Term Paper, literature review	Students will learn to use library resources and scientific searches to find literature about similar bacterial antibiotic resistance/susceptibility through described genetic annotations. Students will summarize their findings in a 3 page literature review. Papers should cite at least 10 references.	1	200	200	20%
			Totals:		**1000**	100%

Date	Week	Lab Activities	Learning Activities	Place
27-Sep	1	Start Koala Poop cultures	Intro to project, create grading rubric for blog and electronic notebooks, entrance surveys	1350 Storer
4-Oct	2	Dilution streaking, Pipetting 101	Labeling conventions	1350 Storer
11-Oct	3	DNA Extractions		1350 Storer
18-Oct	4	PCR Set-up	+/- Controls discussion	1350 Storer
25-Oct	5	Gel, Clean-Up, Qubit		1350 Storer
1-Nov	6	Seq-Trace --> consensus seq for/and BLAST		93 Hutchison
8-Nov	7	Build a Tree	Jonathan's Tree Lecture, Literature review, library instruction	93 Hutchison
15-Nov	8	Antibiotic susceptibility plate set-up	Literature review oullines DUE	1350 Storer
22-Nov	9	Measure antibiotic susceptibility	Antibiotic mechanisms and microbial pathways. Lit Rev. Drafts DUE	1350 Storer
29-Nov	10	Wrap-up or wiggle room day…	Exit Surveys. Lit Review Final Draft DUE	93 Hutchison