

Course Syllabus

MB 599 Collaborative Problem Solving in Biological Data Sciences

3 credits Tuesday 3:00-3:50 PM

Instructor: Maude David

Office: Nash 534, phone: 7-0629, email: maude.david@oregonstate.edu

Please start the subject of all class-related emails with: “MB599_s2018: [Insert your subject here]”

Office hours: by appointment

Class Meetings: One 50 minute lecture or group discussion per week. In addition, students will meet in small groups with a faculty mentor for two hours every week. All meetings are mandatory, one absence can be excused if documented (i.e. doctor's note...).

Learning Outcomes: At the end of this course, students will be able to:

- 1) Communicate effectively with peers from different disciplinary backgrounds in order to collaboratively design and execute a plan to address a research question involving large-scale data.
- 2) Describe and practice the skills and principles of transdisciplinary collaboration.
- 3) Critically assess outcomes of research projects in biological data science.
- 4) Describe opportunities for data science research in life science-related careers and the skills necessary for success in both industry and academia.

Prerequisites: A strong background in Biology, Mathematics, Computer Science or Statistics is required. Participation of graduate students from outside of these focus areas will require instructor approval.

Course Description: The ability to collaboratively analyze large-scale biological data sets is rapidly becoming an essential skill for researchers in all areas of biological sciences. This course is designed to provide students with hands-on experience in collaborating with peers with complementary expertise to solve current problems in life science research. Students from diverse scientific training backgrounds including biology, computer science, mathematics and statistics will be organized into small collaborative research teams. A faculty mentor will guide each team in applying the scientific method to address a specific research question using contemporary bioinformatics and quantitative analysis tools. The multi-disciplinary nature of the research teams will allow students to contribute to the project using their respective areas of expertise, while at the same time gaining hands-on experience in transdisciplinary collaboration and communication. Students will also gain familiarity with concepts and analytical skills from outside their immediate area of expertise. Students will be expected to share the results of their work through in-class presentations and written reports of their group’s scientific findings. Because transdisciplinary and collaborative research skills are highly valued in many post-graduate careers, this course will also provide professional development through lectures and in-class discussions by invited speakers from academia and the biotechnology industry. These weekly presentations will highlight the skills necessary for diverse careers in bioinformatics- and life sciences-related fields.

Evaluation of Student Performance: Total points 250

- Written mid-term research progress report 25 points
- Oral presentation of research findings 75 points
- Written final scientific research report 100 points
- Participation, including group discussions 50 points

An individual student's grade will be determined based on instructor and faculty mentor evaluation of student work. Students will also have the opportunity to gain feedback from other students in the course.

Course grading: (A-F)

A 93 – 100% C 73 – 76.9%
 A- 90 – 92.9% C- 70 – 72.9%
 B+ 87 – 89.9% D+ 67 – 69.9%
 B 83 – 86.9% D 63 – 66.9%
 B- 80 – 82.9% D- 60 – 62.8%
 C+ 77 – 79.9% F 59.9% or lower

Course policies:

Students with Disabilities

Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 541-737-4098.

Student Conduct

The Student Conduct & Community Standards office has generated a set of standards and expectations for student behavior. This information can be found at the following link: <http://studentlife.oregonstate.edu/studentconduct/> (Links to an external site.)Links to an external site.

Course Lecture and Assignment Schedule: Tuesday 3:00-3:50 PM (week 10: 3:00-4:15 PM)

Week 1 04/03 Orientation for students and faculty mentors - Hovland 100

Week 2 04/10 "The Importance of Developing Entrepreneurial Skills For all Career Paths", Karl Mundorff, OSU Advantage Program - Hovland 100

Week 3 04/17 Research teams meet with instructor for progress review

Week 4 04/24 "The Entrepreneurial Mindset", Mark Lieberman, OSU Advantage Program - Hovland 100

Week 5 05/01 Invited lectures from industry speakers, Oregon Biosciences Association - room TBD

Week 6 05/08 Meet with instructor for progress review, Mid-term progress reports due- Hovland 100

Week 7 05/15 Invited lectures from industry speakers, Oregon Biosciences Association - room TBD

Week 8 05/22 Invited lectures from industry speakers, Oregon Biosciences Association- room TBD

Week 9 05/29 Meet with instructor for progress review, Final scientific reports due - Hovland 100

Week10 06/05 In-class presentations by research teams with group discussion and class feedback - Hovland 100 (please anticipate 75 minutes class)

Course Summary:

Date	Details
Tue May 8, 2018	Mid-term progress reports due by 11:59pm
Tue Jun 5, 2018	Assessment of final research reports due by 11:59pm In-class presentations by research teams due by 11:59pm