BDS 413 Capstone Projects in Biological Data Science II SP 2020
3 credits

Class Meetings: Lecture Monday, Wednesday 1000-1050 + one additional hour meeting for project advancement.

Instructor: Dr. Maude David
Office: Nash 537 email: maude.david@science.oregonstate.edu tel. 7-0629
Office hours: Monday 1100-1200 and other times by appointment

Course Description:
Quantitative skills and biological thinking will be used to analyze and draw conclusions from biological datasets retrieved in BDS 412. This is a synthesis course that draws skills in mathematics, statistics, computer science, and biology, in which the students will process their curated datasets, under, and drawing conclusions.

Prerequisites: BDS 412 OR instructor consent
Corequisites: none

BSD 413 Student Learning Outcomes:
At the end of this course, students will be able to:

1. **Apply** appropriate quantitative methods and tools to effectively manage, summarize, visualize, manipulate, to **analyze** large real-world biological datasets
2. **Develop** critical thinking by reflecting on the results analysis
3. **Reflect** on roles and strategies for group work and communicate effectively to collaborate in accomplishing common goals

Evaluation of Student Performance:

**Quizzes:** Short quizzes will be given throughout the quarter. These will test the students on knowledge of the basic concepts.

**Project:** The students will work on the hypothesis they generated in BDS 412, and the datasets they downloaded and curated in BDS 412. Student will work in small groups and each group’s final project data set will be unique. Lab assignments will carry each student through the process of building a reproducible analytical pipeline that addresses his/her hypothesis. The final presentation requires each group to demonstrate the analysis on their unique dataset and be critical about it. They will also be evaluated in their effectiveness in communicating by giving to the instructor prior to the presentation two or three concepts or ideas they will convey.

**Grading:** Course grades will be computed from a weighted sum of points received for the quiz (15%), the project report (20%), the code and communication effort within the team (15%) and the final project presentation (50%).
Final project presentation: 10-minute presentation. Students will sign up for time slots. Students will explain program data inputs, their analysis, and explain the results, which packages they choose and be critical about their analysis.

Grading scale:

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<th>% of points earned</th>
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<tbody>
<tr>
<td>≥ 93</td>
<td>A</td>
<td>≥ 70</td>
<td>C-</td>
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<td>≥ 90</td>
<td>A-</td>
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<td>≥ 87</td>
<td>B+</td>
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<td>≥ 73</td>
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Course Content:
Sample schedule of class meeting topics:
Week 1: Project, datasets and tested hypothesis reminder.
Week 2: Soft skills and team communication emphasis.
Week 3: Testing hypothesis for each group
Week 4: Data visualization / results
Week 6: Data analysis continued
Week 5: Report methods writing. Emphasis on discussion/results critics
Week 7: Team work: current challenges and possible solutions
Week 8: Report introduction
Week 9: Paper analysis and cross-discussion between teams
Week 10: Presentation

Learning Resources:
None. Course material will be made available by the instructor.

Statement Regarding 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 737-4098.

Statement of Expectations for Student Conduct: [http://oregonstate.edu/studentconduct/](http://oregonstate.edu/studentconduct/)

Diversity Statement:
Oregon State University strives to create an affirming climate for all students including underrepresented and marginalized individuals and groups. Diversity encompasses differences in age, color, ethnicity, national origin, gender, physical or mental ability, religion, socioeconomic background, veteran status, sexual orientation, parental status, and marginalized groups. We believe diversity is the synergy, connection, acceptance, and mutual learning fostered by the interaction of different human characteristics.
Oregon State University strives to respect all religious practices. If you have religious holidays that are in conflict with any of the requirements of this class, please contact the instructor immediately so that we can make alternative arrangements.

**Student Evaluation of Courses:**
The online Student Evaluation of Teaching system opens to students the Wednesday of week 8 and closes the Sunday before Finals Week. Students will receive notification, instructions and the link through their ONID. They may also log into the system via Online Services. Course evaluation results are extremely important and used to help improve courses and the learning experience of future students. Responses are anonymous (unless a student chooses to “sign” their comments agreeing to relinquish anonymity) and unavailable to instructors until after grades have been posted. The results of scaled questions and signed comments go to both the instructor and their unit head/supervisor. Anonymous (unsigned) comments go to the instructor only.