**Professor:** Dr. Andrew Karplus, 2133 ALS (karplusp@oregonstate.edu)

**Required Text:** None; readings will be from the literature and additional sources

**Course Hours:** MWF 1:00 - 1:50 p.m. via Zoom and Canvas   
**Office Hours:** By appointment

**Final Project Presentation:** Thursday Jun 10 @ 2:00 – 3:50 p.m.

**Catalog Description:** Covers applications of advanced biophysical techniques and how these fit within the larger context of biochemistry, biology and society. Explores techniques and their applications to macromolecules as well as the scientific process. Techniques discussed include in vitro, in vivo and in silico methods with an emphasis on biomolecular interactions.

**Course purpose:** To provide an interactive capstone experience of applying and synthesizing knowledge from previous Biochemistry & Biophysics courses both through directly engaging with the primary literature and through a cooperative open-ended research project. The course will utilize a “flipped” classroom model, where most information gain occurs via reading, writing and research done outside the classroom, with class time largely used for discussions.

**Targeted learning outcomes:** The intention of the course is that by its end students will …
1. add to their knowledge of biochemistry and biophysics the skill of critically reading the primary literature to assimilate information – recognizing, understanding, and evaluating the content of publications and especially distinguishing results from interpretations;
2. expand their technical vocabulary and understand the concepts behind the analyses in the specific papers discussed;
3. be familiar with the processes involved in manuscript preparation and publication in disciplinary relevant journals;
4. have worked in a team to investigate a real research problem and synthesize and communicate key results both orally and in writing.
5. BB583 students will further have experience leading a research team and helping coordinate the work of multiple teams.

**Learning expectations:** Students in this course will …
1. come prepared for class time having carried out assigned readings, written responses, and exercises;
2. attend class sessions and actively participate in small and large group discussions;
3. participate with teammates to carry out the cooperative capstone term project

**Grading:** Students fully attending, actively participating, and completing each assignment will receive a grade of B- or higher. Final grades based on:
- 50% - Attendance, preparation for and participation in class (up to 2 absences w/o penalty)
- 40% - Cooperative project, including self and team evaluations
- 10% - Exercises

**Course Outline:**

**Week 1 – Overview; Term Project introduction; Peptide Planarity paper**  
**Week 2 – Classic "Hot Spots" paper**  
**Exercise 1: Instructions to authors**  
**Week 3 – Project work**  
**Exercise 2: Manuscript cover letter**  
**Week 4 – Stage 1 Project presentations**  
**Exercise 3: Referee’s reports**  
**Week 5 – Project related paper #1 (CryoEM)**  
**Exercise 4: Responding to Referees**

**Week 6 – Project related paper #2**  
**Exercise 5: Proofs**  
**Week 7 – Stage 2 Project presentations**  
**Exercise 6: Appeals**  
**Week 8 – Project work**
**Exercise: Abstract for Term Project ms**  
**Week 9 – Project work**
**Exercise: Cover letter for Term Project ms**  
**Week 10 – Stage 3 Project presentations;**  
**Exercise: Reflection and debrief**  
Finals Week – Term Project public seminar