**Class Information**
- **Instructor:** Dr. Steve Reichow (office: CLSB 3N022)
- **Email:** reichow@pdx.edu (preferred method of contact)
- **Phone:** 503-725-7766 (office – call for entry to CLSB office area)
- **Office Hours:** TBA or by appointment
- **Location:** CLSB 2S030 **(Feb 21st will be in 2S028)**
- **Time:** 2:00 – 3:30 (Tu & Th)
- **Web Page:** PSU System (D2L): [https://d2l.pdx.edu](https://d2l.pdx.edu)
- **Pre-requisites:** (CH490 or CH350) & (PH203 or PH21) (or equivalent)

**Course Overview**
- **Materials:** The course will focus on classroom lecture materials, readings from the primary literature, and selected chapters from van Holde et al. Principles of Physical Biochemistry, 2nd ed. (ISBN# 0130464279) and Serdyuk et al. Methods in Molecular Biophysics (ISBN# 052181524). Both textbooks are suggested as guides to the discussions in the course and can be found on the web as pdfs.
- **Overview:** This is a 5-week intensive course designed to develop an understanding of biophysical methods used to study the three-dimensional structure and function of biological macromolecules (e.g. x-ray crystallography, NMR spectroscopy and electron microscopy). Students will learn the underlying principles, practical aspects and means of validation and assessment. Sufficient knowledge will be provided to allow students to understand and critically assess the primary literature in these fields.
- **Pre-requisite:** This course will discuss the physical theories that govern and predict behavior of biomolecules and the methodologies that help us achieve a mechanistic understanding of how they work. Discussions will assume knowledge obtained from an introduction to Biochemistry (Structure and Function) as well as a general Physics background. Mathematical literacy at the level of Calculus II is also recommended. If uncertain, please contact the course instructor.

**CH 510: Students**
- CH510 graduate students will prepare a 20 min oral presentation on a selected primary research article related to the course. A description of suitable topics and format will be provided. The instructor should approve the selected article.

*Presentations will be assessed as: excellent (your grade will go up by 1/3 compared to your point total; e.g., A– to A), good (your grade will remain the same as your point total), or poor (your grade will go down by 1/3 compared to your point total; e.g., A– to B+).*
CH510b: Biophysical Methods I (Macromolecular Structure)

Winter 2017

* Terms in this document are subject to change at the discretion of the instructor

Assessment

Grades: Grades will be determined by the performance on a final exam (100 pts), participation in classroom literature discussion (15% of final grade), and assigned homework (up to 15% of final grade).

CH510: CH510 graduate students will also be assessed on an oral presentation (20% of final grade).

Exam: Monday – March 20th, 10:15-12:05p

Homework: Problem sets will be assigned as study guides for the exams and may be graded for up to 15% of the final grade.

Guidelines & Policies

Material: Material for course will come primarily from the course lectures, selected chapters from the textbook and outside readings from the primary literature. It is therefore very important to attend class lectures and keep up with the assigned reading. I recommended a cursory reading of the assigned material prior to the lecture, followed by a thorough reading and practicing the suggested problem sets. I suggest preparing your own notes based on the lecture and reading material. I may post selected class notes, supplemental readings, and other study materials on the course D2L webpage.

Office Hours: I will do my best to always be available during my office hours, although sometimes important meetings are scheduled at that time without my consent. In these cases where my office hours need to be rescheduled, I will notify the class during lecture and/or on the course website.

Exams: Exams will focus on the material covered during lectures. There will be no make-up exams. Missing a midterm exam due to approved and extenuating circumstances (e.g. family emergency or extreme illness with physician’s note) will result in a proportionately greater weight placed on the final exam. Requests for re-grading exams must be submitted with a written (typed) explanation (and bearing in mind that I may re-assess other parts of the exam during the re-grading process).

Grading: Final grades will be determined at the end of the course based on the overall points earned on the exams and oral/written assignments.

Conduct: This is an upper-level course, and as such I expect mature and respectful conduct in the classroom. Misconduct in the form of disrespectful behavior, cheating, plagiarism, or consistent absence will result in removal from the course.

Accommodated Testing:
Students requesting accommodated testing conditions are required to make arrangements through the DRC. Accommodated tests should be scheduled with SHAC Testing Services to overlap with the scheduled exam date & time listed on the course syllabus.
### Calendar

#### Biophysical Methods I (Macromolecular Structure) - Course Schedule

**Classes Tu/Th, 2:00-3:30pm (CLSB 2S030) --- *February 21st will be in CLSB 2S028***

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td><strong>Week 1</strong></td>
<td>Intro: Structure Determination Methods &amp; Light</td>
<td>Tue 14-Feb</td>
<td>Serdyuk A3</td>
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<tr>
<td></td>
<td>Spectroscopy: Absorption and Fluorescence</td>
<td>Thurs 16-Feb</td>
<td>Serdyuk E1, E4, F1, F3</td>
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<tr>
<td><strong>Week 2</strong></td>
<td>NMR Spectroscopy: Spectra, Assignments &amp; NOEs</td>
<td>Tue 21-Feb*</td>
<td>Van Holde 12</td>
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<td></td>
<td>(Literature Discussion)</td>
<td>Thurs 23-Feb</td>
<td>Lit. Reading #5 &amp; #6</td>
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<tr>
<td><strong>Week 3</strong></td>
<td>cryoEM: Image Formation &amp; Analysis</td>
<td>Tue 28-Feb</td>
<td>Serdyuk H1-H2</td>
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<td>cryoEM: 3D recon &amp; New Advances</td>
<td>Thurs 2-Mar</td>
<td>Handout - Review Article(s)</td>
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<td><strong>Week 4</strong></td>
<td>X-ray: Diffraction, Phasing &amp; Refinement</td>
<td>Tue 7-Mar</td>
<td>van Holde 6.1-6.5</td>
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<td>L.C.P/XFEL/MicroED &amp; (Literature Discussion)</td>
<td>Thurs 9-Mar</td>
<td>Handout - Review Article(s)</td>
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<tr>
<td><strong>Week 5</strong></td>
<td>(Literature Discussion)</td>
<td>Tue 14-Mar</td>
<td>Lit. Reading #7 &amp; #8</td>
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<td></td>
<td>Student Presentations &amp; MMC Tour</td>
<td>Thurs 16-Mar</td>
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#### Final Exam

**Date/Time: Monday March 20th, at 10:15-12:05p (Room TBD)**

*Confirm time and place of final exam with instructor during the last week of classes.*