

BB482/582 MOLECULAR BIOPHYSICS

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| INSTRUCTOR | Dr. Afua Nyarko 2039 Ag. Life Sci. Bldg. (ALS) (541) 737-4486; nyarkoa@oregonstate.edu |
| TIME AND LOCATION | 1:00 – 1:50 Monday – Wednesday – Friday ALS 2018 Office Hours: By appointment |
| COURSE OBJECTIVES | Lectures and hands-on projects using a few important biophysical techniques for studying biomolecules and their interactions. Topics will cover the basic principles, and experimental design, with major emphasis on data handling and analysis. Graduate students will receive additional experience in instrumentation and data collection. |
| LEARNING RESOURCES | Assigned readings and articles from the literature Principles of Physical Biochemistry, 2nd Ed.” by van Holde, Johnson, and Ho (recommended) |
| PREREQUISITE | BB 481/581, CH442 |
| LEARNER OUTCOMES | Students completing this course will be able to <ul style="list-style-type: none">– Explain the key concepts, and experimental design considerations for seven biophysical methods [circular dichroism, isothermal titration calorimetry, nuclear magnetic resonance spectroscopy, fluorescence spectroscopy, surface plasmon resonance, analytical ultracentrifugation, and small angle light scattering] used to investigate biomolecular structures and interactions.– Critically evaluate and analyze primary literature using the six selected biophysical techniques.– Use the NMR visualization program SPARKY, and HSQC, CBCA(CO)NH, and HNCACB spectra to sequentially assign the HN, N, CA, and CB resonances of a small protein (< 10 kDa).– Determine the secondary structure of a protein from far UVCD data, and NMR chemical shifts <p>BB582 students completing this course will further be able to</p> <ul style="list-style-type: none">– Setup a heteronuclear single quantum correlation NMR experiment, collect and analyze the data. |
| LEARNER EXPECTATIONS | Students are expected to arrive to class on time. No cell phone usage in class. This course will require you to spend time reading assigned materials. Students are expected to read assigned materials prior to class, and come prepared to participate in classroom discussions Students are expected to participate fully in all group projects |
| COURSE EVALUATION | I. BB 482 Students: 250 total points <ul style="list-style-type: none">a. Midterm exam - Friday, February 9th, 2018 (100 points)b. Class presentation - Group-led discussions of assigned primary research article (20 points)c. In-class group work (30 points)d. Final exam (comprehensive) - Thursday, March 22nd, 12:00 pm. 80 % of the final exam will be material covered after the mid-term exam (100 points) II. BB 582 Students: 300 total points <ul style="list-style-type: none">a. Midterm exam - Friday, February 9th, 2018 (100 points) |

- b. Class presentation - Group-led discussions of assigned primary research article (20 points)
- c. In-class group work (30 points)
- d. Final exam (comprehensive) - Thursday, March 22nd, 12:00 pm. 80 % of the final exam will be material covered after the mid-term exam (100 points)
- e. Special project (Due February 5th, 2018) - Work together to create an instructional video on NMR instrumentation, data collection, and analysis (50 points)

EXAM POLICY

Makeup exams MAY be given for absences excused by the instructor in advance of the exam. Excused absences will not be given for airline reservations, routine illness (colds, flu, stomach aches) or after the absence has occurred

TOPICS COVERED

Circular dichroism (CD)
 Fluorescence spectroscopy
 Isothermal titration calorimetry (ITC)
 Nuclear magnetic resonance spectroscopy (NMR)
 Small Angle X-ray scattering (SAX)
 Surface Plasmon resonance (SPR)
 Analytical ultracentrifugation (AUC)

UNIVERSITY POLICY

“The goal of Oregon State University is to provide students with the knowledge, skill and wisdom they need to contribute to society. Our rules are formulated to guarantee each student’s freedom to learn and to protect the fundamental rights of others. People must treat each other with dignity and respect in order for scholarship to thrive. Behaviors that are disruptive to teaching and learning will not be tolerated, and will be referred to the Student Conduct Program for disciplinary action. Behaviors that create a hostile, offensive or intimidating environment based on gender, race, ethnicity, color, religion, age, disability, marital status or sexual orientation will be referred to the Affirmative Action Office.”

Students with documented disabilities

Accommodations for students with disabilities are determined and approved by Disability Access Services (DAS). If you, as a student, believe you are eligible for accommodations but have not obtained approval please contact DAS immediately at 541-737-4098 or at <http://ds.oregonstate.edu>. DAS notifies students and faculty members of approved academic accommodations and coordinates implementation of those accommodations. While not required, students and faculty members are encouraged to discuss details of the implementation of individual accommodations.

Expectations for student conduct

The Student Conduct Code establishes community standards and procedures necessary to maintain and protect an environment conducive to learning, in keeping with the educational objectives of Oregon State University. This code is based on the assumption that all persons must treat one another with dignity and respect in order for scholarship to thrive. For the full Student Conduct Code see <http://oregonstate.edu/studentconduct/>

Academic or Scholarly Dishonesty is prohibited and considered a serious violation of the Student Conduct Code. It is defined as an act of deception in which a Student seeks to claim credit for the work or effort of another person, or uses unauthorized materials or fabricated information in any academic work or research, either through the Student’s own efforts or the efforts of another. For specifics related to offenses proscribed by the University see: <http://oregonstate.edu/studentconduct/offenses-0>

Religious holiday statement

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 see me immediately so that we can make alternative arrangements

Behaviors disruptive to the learning environment will not be tolerated and will be referred to the Office of Student Conduct for disciplinary action.
