**Course Title:** GenBiochem Lab II – Advanced Biotechnology Spring 2017

**General Information:**

Instructor: Dr. Jinglin Fu

Office: Science Building #306A

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Lab time: Thursday 1:20 p.m. – 4:20 p.m.

Location: Science Building #329

Office hour: Friday noon (12:20 pm - 1:20 p.m)

Course pre/co - requisites: Biochemistry Lab I, Biochemistry Lecture I&II

Required Text: No special text books. All the lab instruction and protocols will be posted on the Sakai.

**Course Description** This course is designed to expose students to the independent research project and comprehensive biochemistry experiment experience. Advanced technologies will be introduced and practiced, including Atomic Force Microscopy, HPLC-protein chromatography, inhibition and activation, complex UV-VIS/fluorescence spectrometry and scientific data analysis and fitting, etc.

**Learning Goals:** Students should able to use UV-VIS/fluorescence spectrometry to characterize biochemical relations, interpret and fit important kinetic parameters, perform hand-experience on advanced bio-techniques of HPLC-protein chromatography, Atomic Force Microscopy characterization of nanostructures. Students will also learn computational design of DNA and protein nanostructures.

**Lab Safety** Students are expected to abide by the general lab safety rules as reviewed by the safety video. **If you have not watched any lab safety video before, talk to the instructor!**

**Lab coats, Goggles and gloves** are required in the lab, this is for protecting yourself. Full eye shield goggles are required, not the glasses type shields. Nitrile gloves are provided in the lab with small, medium and large size.

**Closed-toe shoes are required by the lab. Wear open-toe shoes (e.g. sandal) will be forced to leave the lab, and accounted as an excused absence!**

No eating or drinking in the lab at any time!

**Waste disposal** Only water can be directly poured into the sink. Other wastes such as salt buffer and natural biomolecules including proteins, peptides and DNA must be stored in the Biochemical Waste Container. Plastic waste including pipette tips, tubes must be deposed into Plastic Waste Container. Organic reagents, indicators and dyes must be disposed into the specific waste containers, stored in the hood in SCI-329.

**Cell phone and computer use:** Cell phones or other communication devices may not be used during the lab and must be silenced. During lab, cell phones may only be used in theevent of an emergency. Please notify the instructor if an emergent condition arises that requires the use of a cell phone. During lab, cell phones must remain silent and stowed in your bag. **Speak on the cell phone without the instructor’s permit will result in a decrease of lab performance points! No texting message, think about what may leave on your finger!**

During lab, computers may be used only if you are doing data analysis, academic search or working on the reports. Please respect the other members of your lab and refrain from playing any music and/or videos.

**Attendance:** Attendance of all labs is mandatory*.* **Lab cannot be make-up.**

**Unexcused absence** will result in an automatic drop of one letter grade for your final grade. For example, assume a final grade of A:

missing one lab, Grade A -🡪 B;

missing two labs, A-🡪C;

missing three labs, A-🡪D;

**Excused absence** includes medical emergency (physician’s approval of absence) and family emergency (e.g. funeral, wedding) or other compelling circumstances that prevent your attendance in the lab; **not includes** vacation travel or parties. For excused absence, official evidences must be submitted to the instructor and better notify 24 hours before the lab class. Excused absence will not result in an automatic drop of grade.

**Absence from three (excused or unexcused) or more labs will result in a failing grade.**

**Late policy:** Late more than 10 mins will not be allowed to perform the lab. You can observe other to perform the experiment. Late more than one hour will be counted as one unexcused absence, unless there is compelling circumstances that prevent your attendance in the lab (count as an excused absence).

**Assessments and Grades:** Your final grade will be determined by your performance in the lab, notebook, lab reports, datasheet, pre-lab quizzes, and final presentation.

**Lab Performance (20%)**

**Notebook (10%)**

**Pre-lab quizzes (10%)**

**Lab reports or datasheet (50%)**

**Final Presentations (10%)**

**Total: 100%**

***The lab performance*** is evaluated by: prepare the lab, attend the lab on time, be able to figure out lab procedures, independently finish lab calculation, carefully performing experiments, observing and concluding lab results.

***Notebook Requirement*** Students will keep a notebook for all of the experiments except the first lab. This notebook will be used for planning experimental procedure and recording data. Before performing the experiment, the instructor needs to approve on your designed procedures. **For each lab, instructor’s signature on the notebook is required.** Each lab needs to label with title and date. The cover page is also required summarizing all the labs and pages.

***Pre-lab quizzes*** There will be pre-lab quizzes to help students to understand the experiment that is going to conduct. **Quizzes will be posted online on Sakai** at least 48 hours prior the lab. Students are required to read the instruction and complete the quizzes before the lab session, and submit the printed copy to the instructor during the lab period. Fail to submit the quiz on time will result in the loss of points.

***Lab reports or datasheet*** The lab report should be a typed summary of what you did and learned in the lab. Reports are to be turned into the instructor at the beginning of the next lab period. A general lab report includes Introduction, Experimental Materials and Methods, Results and Discussion. A sample lab report is posted in the Course Information section on Sakai. It is strongly suggested that you look over the sample report prior to writing your lab reports. Lab reports should be less than 10 pages. All lab reports must be submitted in printed copies for receiving a grade in the course. Lab reports are an individual effort that displays your knowledge and understanding of the lab material. Reports must be written in your own words. **You cannot copy verbatim from any source, including other individuals in the course.** Any infractions to this rule are considered as academic plagiarism. You are welcome to consult with your lab partner or other people in the class; however, you must write your lab report as an individual effort. You must cite any references that you use in preparing your reports.

**Electronic copy of lab reports:** In addition to the print copy that is given to the instructor, you must submit an electronic copy via email. **Failure to do so will result in a complete loss of report points for the lab. The electronic copy must be an exact copy of what you turn in to the instructor and must be received within 24 hours of turning in the paper copy.** The filename must be as follows: lab#-your name. For example, if John Doe was turning in the third lab report, he would submit a file with the name lab3-john doe. Any files submitted with an incorrect name will be rejected.

**Academic Integrity** You are expected to do your own work and record/describe the experiments we do in your own words. Copying someone else’s procedure/data is considered as academic plagiarism. First infraction to the rule will result in an automatic drop of the final grade. Second infraction the rule will result in the fail of the class as well as marked with E\* (failure due to academic dishonesty).

You cannot directly copy the background or procedures on the instruction manual. Write the Lab background and methods in your own language.

Please see:<http://www.camden.rutgers.edu/RUCAM/Academic-Integrity-Policy.php> for more information about policy.

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| **Biochemistry Lab II Schedule Spring 2017** | |
| **Date** | **Experiment** |
| 1/19/2017 | Course Introduction |
| 1/26/2017 | Enzyme cascade reaction |
| 2/2/2017 | The detection of glucose by cascade reaction |
| 2/9/2017 | The uptake of glucose by phosphorylation |
| 2/16/2017 | An electron-transport redox reaction |
| 2/23/2017 | Log P measurement |
| 3/2/2017 | DNA binding with tetracyclines |
| 3/9/2017 | Structural Protein (Pymol) |
| 3/16/2017 | Spring Break |
| 3/23/2017 | Structural DNA nanotechnology - Design 1 |
| 3/30/2017 | Structural DNA nanotechnology - Design 2 |
| 4/6/2017 | Assembly of DNA origami structures |
| 4/13/2017 | AFM characterization of Nanostructures |
| 4/20/2017 | A discussion on Bio-nanotechnology |
| 4/27/2017 | Final presentation |

After reading the syllabus, please sign at the bottom for understanding and follow the lab rules.

Name

Date