Biochemistry 412—Fall 2017
Syllabus and Course Policies

Instructor: **Dr. Nicola Ayres**
Room 210 Biochemistry and Biophysics
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Office Hours: Generally available during class hours; stop by or make an appointment

Contact Information			
Section	**TA/email**	**Office**	**Office Hours**
Secretary	**Mrs. Tillie Rausch** trausch@tamu.edu	BioBio 410	8:00-5:00

While the introductory biochemistry courses (BICH 410 & 411) focus on theory, BICH 412 focuses on applying those theories, thus helping you better understand the concepts you have learned. BICH 412 is a hands-on laboratory course in which you will learn basic techniques of biochemistry. You will also gain experience interpreting and reporting experimental results. More importantly, you will learn how to apply these skills to solve problems in the life sciences.

In this course, you will learn:

- The theory and principles of biochemical techniques including chromatography, electrophoresis, and biochemical assays.
- Proper analysis, interpretation, and presentation of experimental data to obtain information about biological molecules.
- The operation of common laboratory equipment including spectrophotometers, micropipettes and electrophoresis units.
- How to keep a laboratory notebook.
- Calculations for preparing solutions.

What You Need

The lab manual can be purchased from the Barnes and Noble Bookstore at the MSC or Textbook Solutions on Texas Avenue. In addition, you will need a composition notebook with lines to serve as a laboratory notebook – a spiral is not sufficient. These are available at most college bookstores, Target, Walmart, etc.

Electronic Resources

We will use eCampus (ecampus.tamu.edu) to record all grades. The site will have the syllabus, a copy of the lab manual (you still need to purchase one) and the lectures. Other information will be posted as needed.

What to Expect

Some labs are divided into multiple classes. Before coming to class, you should read the appropriate part of each experiment. In addition, you need to complete the **Purpose, Background** and **Procedure** sections of your lab notebook for that day's work. When you come to class, your TA will check your notebook. Before you leave class, you will need to complete the **Results** section of your notebook. Show this to your TA before leaving class. The **Discussion** and **Conclusion** sections should be finished before coming to the next class. The requirements for keeping a laboratory notebook will be discussed in more detail in class. Please note that **only ink** may be used in the notebook; pencil is not allowed. Keeping a detailed notebook will be part of your lab performance grade.

In addition to performing each day's experiment when you come to class, many days you will also complete a **worksheet** designed to help you understand the concepts behind the experiments we will be performing as well as how to analyze the data we will be collecting. Some of these worksheets will be completed in class while others may have portions that must be completed outside of class. These worksheets will help you do some of the calculations needed to obtain the final results of your experiments and should be recorded in your notebook.

Over the semester, you will have **quizzes** to test your knowledge. The lowest quiz will be dropped from your final average. For each quiz, you will be allowed to use your lab notebook, but not your lab manual, worksheets, or any other papers. The quizzes will cover material from previous lab sessions and from the lab to be done that day. Quizzes will last about 20 minutes. If you arrive late, you will not be given any extra time to complete the quiz. If you arrive after the quiz has been finished or if you miss the laboratory section without an approved university excuse, you will receive a zero for the quiz. The quizzes will include both the theory covered in the lab manual and lectures and the experiments performed. On the last day of class, you will be given a **final exam** covering all of the material from this semester. This will include both written and practical information. For example, you may be tested on pipetting, using a spectrophotometer, etc.

Most of the experiments in this laboratory class are done with partners. To ensure that both partners participate fully in the experiments, part of your grade will be based on how well you **perform** in class. If you depend on your partner to do all the work and know what is going on, you will be graded accordingly. You are expected to come to class on time, be prepared for the work to be done, and stay till all experiments are completed and cleaned up. You should be sharing the work equally and work efficiently. Proper safety in the lab will also be evaluated.

Grading

The worksheets, your notebook, lab participation, quizzes, and the final exam will determine your grade in this course. The contribution of each assignment to your final grade is listed below.

Assignment	Points
Worksheets	310
Quizzes (top 4)	400
Final exam	400
Lab performance/notebook	100
Total	1210

The course schedule lists due dates for major assignments. However, these dates are subject to change. Grades will be assigned according to the following scale:

A	90-100%
B	80-89%
C	70-79%
D	60-69%
F	< 60%

Note that your teaching assistants or instructor may lower your grade on an assignment for reasons including, but not limited to, any of the following:

- Being unprepared for an experiment
- Leaving the laboratory before completing your work
- Arriving to class late
- Violating safety regulations
- Conducting yourself unprofessionally
- Plagiarizing another student's work

If you find any discrepancies in posted grades or have any questions about the grading, you must inform the TAs or Dr. Ayres within one week of their posting on eCampus. No grade changes will be made more than one week after posting.

Extra Credit

No extra credit is available.

BICH 412 Schedule
Fall 2017

Schedule of Topics (subject to change)**:**

Class Period	Content
Aug. 28-Sept. 1	No lab
Sept. 4-8	Worksheet 1 Pipetting/Specs/Calculations No pre-lab write-up
Sept. 11-15	Expt. 1 Part I Determination of Reducing Sugar Conc. – DNS Assay Pre-lab write-up #1 Worksheet 1 due
Sept. 18-22	Quiz 1 Expt. 1 Part 2 Determination of Reducing Sugar Concentrations – Glucose and Fructose in Glycolysis and the Pentose Phosphate Pathway Pre-lab write-up #2 Worksheet 2 due
Sept. 25-29	Expt. 2 Part 1 - Induction of GFP & Cell-Free Extract of GFP and RFP-TAT Pre-lab write-up #3 Worksheet 3 due
Oct. 2-6	Quiz 2 Expt. 2 Part 2 Gel Permeation Chromatography to Purify GFP and RFP-TAT Pre-lab write-up #4
Oct. 9-13	Expt. 2 Part 3 SDS-PAGE of GFP and RFP-TAT Samples Pre-lab write-up #5 Worksheet 4 in class, (elution profile made before class)
Oct. 16-20	Quiz 3 Expt. 2 Part 4 SDS-PAGE documentation No pre-lab write-up
Oct. 23-27	Expt. 3 Part 1 Substrate Specificity of Alcohol Dehydrogenase Pre-lab write-up #6 Worksheet 5 due
Oct. 30-Nov. 3	Quiz 4 Expt. 3 Part II Molecular Modeling of Alcohol Dehydrogenase Pre-lab write-up #7 (Purpose and Background only) Worksheet 6 due, Worksheet 7 due (done in class)
Nov. 6-10	Quiz 5 Expt. 4 Rate Enhancement of ONPG Hydrolysis Pre-lab write-up #8
Nov. 13-17	Worksheet 8 due Review
Nov. 27-Dec. 1	Final Exam - Practical

Attendance

As this is a hands-on course, attendance is mandatory. **You must arrive on time** and stay until the class is over. Sometimes we may have discussions after everyone has completed the day's experiment. Check with your TAs o before leaving. Arriving to class late will result in **a half point reduction off your final course grade** for each incidence. Missing a class for an unexcused absence will result in **a three point reduction to your final course grade** for each incidence in addition to any grade penalties for work that is due for the class period you miss.

You must come to class prepared for the work that will be done, turn in your assignments on time, and clean up at the end of each class. Grade penalties may be applied for failure to do this. In addition, part of your final grade will be awarded by your TA and instructor for your in-class participation. While much of the work will be done in pairs of lab partners, both partners are expected to fully participate. If you fail to carry your share of the work load, or if you are unprepared or have safety issues, you will be graded accordingly.

Students with university excused absences must make arrangements to make up any missing work, in the same week as the excused absence whenever possible. Information on university excused absences can be found at http://student-rules.tamu.edu or more specifically http://student-rules.tamu.edu/rule07. This site also contains a form that may be filled out to provide documentation of an absence of three days or less without a doctor's note. This form is available at http://shs.tamu.edu/attendance.

You must coordinate all absences and turn in all make up work through Mrs. Tillie Rausch in room 410 (phone 845-6831) of the Biochemistry building. Since each lab experiment only lasts for one week, **you must make up a missed lab the same week** if at all possible. If you do not present the forms for an absence to Tillie Rausch within 48 hours of the missed class, in person or by email, the absence will be considered unexcused and the penalties will apply. As stated in the student rules, the notification should include a written explanation of why notice could not be sent prior to class.

Late Penalties

For excused absences, you must make arrangements with Dr. Ayres to take any quizzes or exams **within 48 hours of the absence**. For an unexcused absence, no makeup quiz will be given. All other work must be turned in on time, except when a university-approved excuse is presented as per university rules. Work that is up to 24 hours late will incur a 20% grade penalty; up to 48 hours after the deadline will incur a 40% penalty, with an additional 20% penalty for each subsequent day. No late work will be accepted after 5 days. If you have a university-approved excuse, you will be given a 48 hour grace period before the grade penalty applies to worksheets that were due during your missed class, unless other arrangements are made with Dr. Ayres within the grace period.

Plagiarism

Plagiarism is the act of presenting another person's ideas, writings, work, etc. as your own. As such, it is in direct violation of the Aggie Honor Code which states:

"An Aggie does not lie, cheat, or steal or tolerate those who do."

Students who plagiarize lie because they are presenting work they did not do as their own. They cheat by not doing the work they are supposed to do. They steal by taking away from the intellectual efforts of others. Scholastic research relies on the free exchange of ideas. Plagiarism destroys the trust between students and faculty. As such, it is a grave academic offense and must be actively avoided. "I didn't mean to plagiarize" is not a valid excuse. Similarly, if your classmates plagiarize your work, you will be held accountable as well. Students who plagiarize in BICH 412 will be subject to the procedures outlined in section 20 of Texas A&M Student Rules (http://student-rules.tamu.edu/). Depending on the circumstances of the case, consequences can range anywhere from severe grade penalties to expulsion from the university and can include ineligibility to hold office in any student organization, loss of scholarships, ineligibility to receive an Aggie ring and inability to graduate with honors.

Please note that students are allowed to work together. However, the work each student turns in should reflect his or her personal effort. All written material, including graphs and tables, must be done by yourself. Simply rearranging your lab partner's sentences or changing a few adjectives here and there is not enough to make a work your own. You may not provide copies of graphs, etc. for your partner; these should be done individually. Because each person uses language differently, no two people will ever provide identical answers to the same question no matter how closely they discuss the problem ahead of time. For information about avoiding plagiarism, visit
http://libraryasp.tamu.edu/bi/Tutorials/F08/AcadIntegSt.htm.

Mandatory Academic Integrity Statement
(From the Aggie Honor System Office)

"Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning, and to follow the philosophy and rules of the Honor System. Students will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the TAMU community from the requirements or the processes of the Honor System.

"For additional information please visit: http://www.tamu.edu/aggiehonor/"

The Americans with Disabilities Act

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life for Students with Disabilities in Room B118 of Cain Hall or call 845-1637.

Laboratory Equipment

Your lab fees have provided many instruments for this lab, including spectrophotometers, electrophoresis units, computers, and a gel documentation system. We will teach you how to use all of the necessary equipment for each experiment. To ensure the optimal performance of laboratory instruments, do not attempt to use any equipment until your teaching assistant or instructor gives you directions. If equipment malfunctions, **notify your teaching assistant or instructor so we can repair or replace it as soon as possible.** Do not remove equipment or chemicals from the laboratory.

Workstations

For most experiments you will be working in two-person groups. The classroom has 16 workstations numbered on the work drawers. Each workstation has a common equipment drawer that contains cuvette holders, tube racks, scissors, markers, etc. Make sure you replace all of these items in the drawer at the end of each lab period.

In addition, every seat has a student drawer that should contain one pair of safety glasses. Gloves are also provided.

You and your lab partner will be responsible for the care of equipment at your workstation. Report any problems or missing items to your teaching assistant. Please do not use equipment from other stations unless directed to do so by your teaching assistant or instructor.

Cleaning

Before leaving class each day you should:

- ❑ turn off all equipment
- ❑ replace empty pipette boxes with full ones as needed
- ❑ empty waste containers
- ❑ wash dishes, rinse with distilled water, place on the dish cart
- ❑ wipe down your bench with a sponge

Remember that all of this factors into your lab performance grade.

Laboratory Safety

Biochemistry research involves the use of many different chemical reagents and many types of laboratory equipment. You should always use caution when dealing with any chemical. However, some chemicals require more careful handling than others. Extra precautions for using such chemicals will be noted in your lab manual. We will provide safety glasses and gloves for your convenience.

Each student must read, sign and turn in a safety agreement before working in this laboratory. You should pay close attention to the safety requirements for each lab period. These are detailed in your lab manual and will be listed in the TA's presentation and on the blackboard. It is your responsibility to understand and obey all of the safety requirements.

In addition:

- No eating, drinking, or chewing gum in the laboratory.
- You must wear closed toe shoes in the laboratory
- No handling contact lenses.
- No smoking in the laboratory or in the Biochemistry and Biophysics building.
- Know the location of fire extinguishers, eyewash stations, safety showers and fire alarms.
- **Never put glass in the regular trash, use special "glass only" containers.**

If an accident occurs, immediately notify your teaching assistant.

The Emergency Number on Campus is 9-911

The *Campus Health Center number is 5-1511*

An important safety resource is the Environmental Health and Safety Department web page located at http://ehsd-online.tamu.edu/. Among other things, you can access Material Safety Data Sheets from this site that describe the precautions you should take when working with some of the chemicals we will be using in this lab. Safety information and a notebook of MSDS information are also located just inside the entrance to the laboratory.

BICH 412/414 LABORATORY SAFETY REGULATIONS

In addition to the online Safety Agreement that you filled out, you must follow the lab specific safety regulations below to ensure your safety and the safety of others. Students not complying with these rules may face grade penalties and/or dismissal from the laboratory. If you have any questions, consult your instructor.

1. Never work in the laboratory unless a teaching assistant (TA) or laboratory supervisor is present. Follow all safety guidelines outlined in the laboratory manual or otherwise communicated to you by your instructor. Never perform unauthorized experiments.

2. Eating, drinking, and smoking are never allowed in the laboratory. Never taste chemicals.

3. Carefully read all instructions and thoroughly plan your work prior to beginning.

4. Learn emergency procedures and know the locations and operation of the nearest eye wash, shower, and chemical cleanup materials.

5. Feet must be protected by closed-toe shoes at all times in the laboratory. Bare feet, sandals, and open-toed shoes are not permissible. Confine long hair when instructed.

6. Aisles must be free of clutter. Thus backpacks and other personal articles should be secured beneath your workstation.

7. Dispose of waste chemicals only as instructed by your laboratory instructor or TA.

8. Needles, glass or other sharp objects must be disposed of in special containers as instructed by your TA. They must not be disposed of in the regular trash receptacles.

9. Safety glasses must be worn when indicated in the lab manual or when instructed.

10. Notify your TA or lab supervisor immediately of any injury, accident or spill in the lab.

I realize that all chemicals are potentially dangerous; therefore I will use care in handling them. If I am unsure of the potential hazards of any chemical, I will discuss this with my instructor prior to use. If I have a medical condition such as, but not limited to, hypo- or hyperglycemia, diabetes, epilepsy, pregnancy, heart ailments, or **any other medical condition** which may cause sudden loss of consciousness, I certify that I am under a doctor's care and that my doctor has given me explicit permission to participate in this laboratory course. I will inform my instructor of my condition at the beginning of the semester, or as soon as I am aware of the existence of the medical condition.

I have read and understand the Biochemistry 412/414 lab safety regulations, and will comply with these regulations for my own safety and the safety of others. I understand that failure to comply with these regulations may result in grade penalties or expulsion from the course.