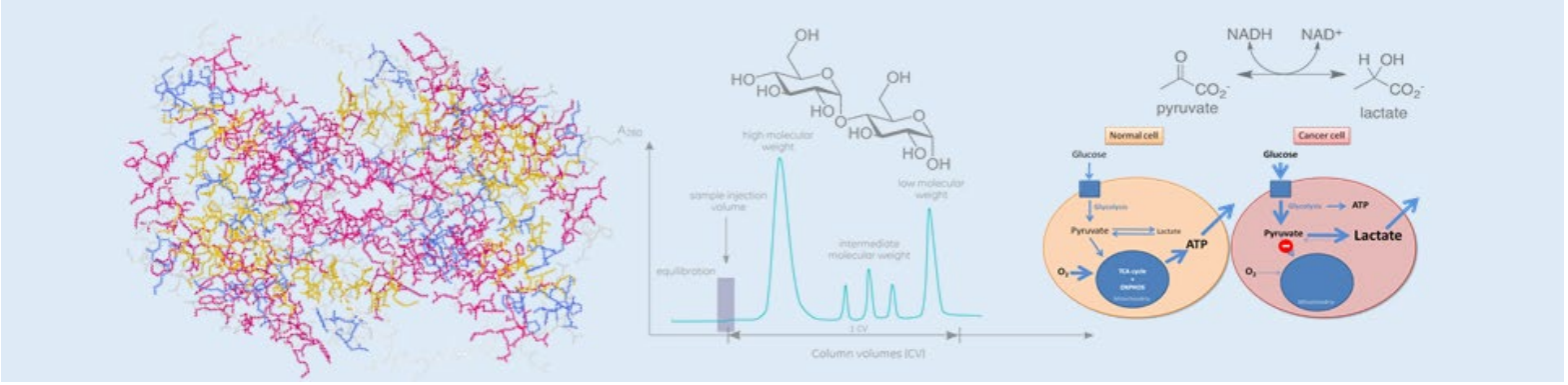

Biochemistry Lab, Spring 2019 BCHM 309

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What Students Say

- "Her labs were rigorous, and she pushed the students to do their very best…. Even though I wasn't enthusiastic about designing our own experiment at the time, I'm glad now that I did -- it forced me to look at the material differently, and my understanding of the material was much better... This lab was definitely a challenging course, but I'm proud of the grade I got!"
- "I did like having the lecture videos to watch before lab. It made our time in lab less stressful by having some knowledge prior to the lab."
- "Dr. Hart has been one of my favorite professors. She was very helpful throughout the semester and truly emphasized that we had the ability to learn the material… I liked how the course was set up… I haven't learned this much in a lab since I've been in college. It was phenomenal. She and [the TA] were always available for questions, which made me understand the material even more."

Course Resources*

Dr. Hart: ohart@purdue.edu

Location: BCHM 116

Blackboard

Google

Google Drive

slack

***No textbook required!**

Your Teaching Assistants

John Whitney		**Lab section:**	Tuesday 8:30am
		Email:	whitneyj@purdue.edu
		Help Session:	Fridays 3-4 pm, BCHM 107
Kelsey Bullens		**Lab section:**	Tuesday 11:30am, Thursday 11:30am
		Email:	kbullens@purdue.edu
		Help Session:	Wednesday 4-5 pm, BCHM 107
Sarah Innis		**Lab section:**	Tuesday 2:30pm
		Email:	sinnis@purdue.edu
		Help Session:	Mondays 3-4 pm, BCHM 107
Gabby Buck		**Lab section:**	Thursday 2:30pm
		Email:	buck16@purdue.edu
		Help Session:	Mondays 3-4 pm, BCHM 107

Course Description

Students who enroll in BCHM 30900 have wide-ranging interests and aspire to pursue careers in biological science, medicine, veterinary medicine, animal sciences, dietetics, food science, botany and nutrition. This course will provide students with the basic foundation of biochemistry concepts, experimental design and scientific communication that will be required for the pursuit of their academic and career objectives.

Learning Outcomes

When you complete this course, you will be able to:

- Discuss how the structure of biomolecules, such as proteins, nucleic acids, lipids and carbohydrates, determines their overall biological function in addition to their behavior in experimental settings.

- Demonstrate proficiency in the following lab skills:
    - Liquid handling and dilutions
    - Protein purification and determination assays
    - Column chromatography
    - Spectrophotometric assays
    - Enzyme activity assays
    - Lab calculations and data handling

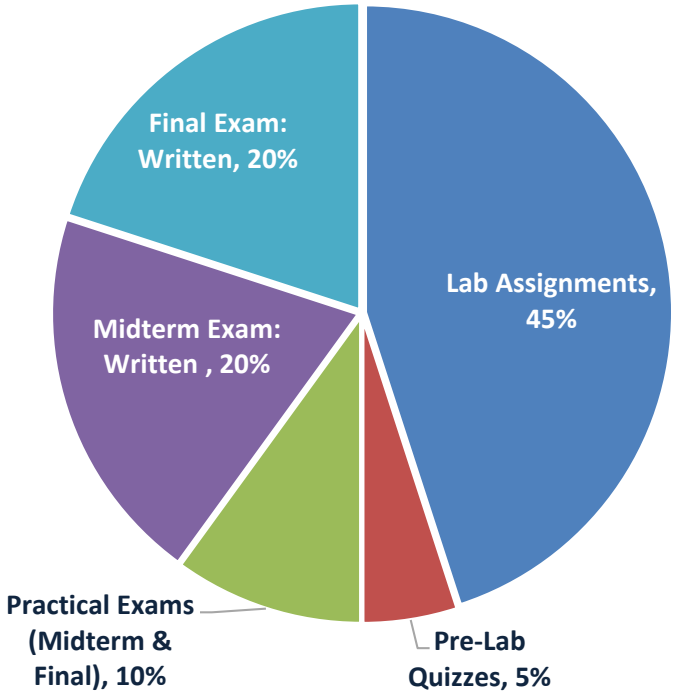
- Understand and apply scientific methods of experimental design and analysis.

- Apply quantitative reasoning in data analysis and reporting.

- Communicate scientific ideas clearly, both orally and in writing.

- Collaborate with peers from diverse programmatic and cultural backgrounds to enhance your and their learning experience.

Assessment & Grades



Lab Assignments

At the end of most labs you will have a written lab assignment which will be due at the beginning of the following lab period. See Assignment section for specific details. Lab reports should be submitted on Blackboard before the beginning of the lab session in which they are due. Submit your lab assignment on time to avoid a 20% per day late penalty!

Quizzes

You need to bring your laptop for these quizzes! There will be a quiz before every lab, unless specifically indicated by Dr. Hart, to reward you for preparing for class. It will cover only very basic material from the lecture material slides, and/or material which is considered pre-requisite for BCHM 309. Each quiz will be worth 5 points. Please show up on time for lab to make sure you can take the quiz, which will close 5 minutes after the start of class.

While there is no official extra credit in the course, Dr Hart encourages you to use the **Blackboard discussion board to ask content-related questions, and answer questions your peers have asked. Your **meaningful participation** may be eligible to give you up to **15 points extra credit** at the end of the semester (useful for those on a grade bubble!).*

Lab Examinations

There will be two exams in this course; a mid-term exam and a final exam at the end of the semester. The lab exams will include both written and practicum sections, and cover how to properly use lab equipment, calculations, and techniques that you have learned during the semester. **The final exam will cover material from the entire course.**

What will your Final Grade be?

Points	Percentage	Grade
900-1000	90.0-100%	A
800-899	80.0-89.9%	B
700-799	70.0-79.9%	C
600-699	60.0-69.9%	D
0-599	0-59%	F

Participation

You are expected to work with your lab partners to complete a lab. Allowing your lab partners to do all the work for you will result in a 0 for the lab. If you do not clean up your workstation before you leave, all members of your group will be penalized 10% of the points for that lab.

Testing Accommodations

Where possible, Dr. Hart will work with you to fulfil your testing accommodations. Contact her as soon as you can (don't forget your paperwork!) to discuss your needs, and what accommodations are appropriate and possible for the course.

Make-ups for Labs and Exams

Unfortunately, because of the schedule and sequence of labs, and the number of students in the class, makeup labs and exams are not possible.

If you are representing Purdue in some capacity, contact Dr. Hart to discuss what you need to do. Be prepared: documentation will be required. While every case will be assessed individually, see the table below for examples of what may or may not be considered an excusable absence:

No-Shows

- If you do not show up to lab (unexcused absence), the maximum grade you can get in the course is a C.
- If you miss two labs, that's an automatic F.
- If you don't show for an exam, you will get a zero.

To avoid these consequences, please communicate with Dr. Hart and/or your TA in advance of any lab you will miss!

We can probably work something out*	**This is not going to be an excused absence**
You are ill and have documentation from PUSH	*You need to take extra days at Spring Break to spend time with your family.*
You are representing Purdue at the National [insert awesome conference/meeting here]	*You booked your flights for [someplace] already.*
You are participating in a Varsity or Club competition	*You are going on a study abroad.***
You have military duty	*You have an interview for an internship*
You have a family emergency	

*__Documentation__ is required before any absence will be considered as excused. In addition, except in the case of an emergency, you must discuss your absence with Dr. Hart as soon as possible, and no later than two weeks prior to the requested absence.

**You are encouraged to go on Study Abroad! But, make sure that the departure dates do not interfere with when you are required to be in class.

BCHM 309 Policies

NON-DISCRIMINATION

Purdue University's non-discrimination policy will be upheld in this classroom. Purdue University is committed to maintaining a community which recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual to strive to reach his or her own potential. In pursuit of its goal of academic excellence, the University seeks to develop and nurture diversity. The University believes that diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life.

Purdue University views, evaluates, and treats all persons in any University related activity or circumstance in which they may be involved, solely as individuals on the basis of their own personal abilities, qualifications, and other relevant characteristics.

CELL PHONES

Do not use your cell phones in lab. If you are caught using your phone in lab you will receive a zero for the lab.

LAB SAFETY & PPE

Please review the Lab safety section of this syllabus. Failure to adhere to lab safety rules will endanger you, your classmates, and anyone else who uses the lab. Violations of lab safety rules will result in a warning for the first occurrence, and a grade penalty for subsequent occurrences.

ATTENDANCE

- Attendance of each assigned laboratory period is mandatory. Students that do not attend will receive a zero for that laboratory exercise. Students that miss one class will not be eligible for a grade higher than a C. Students that miss two classes will receive an F. There will be no opportunity for make-up labs.

- You will not be allowed to leave the lab before the end of the lab period until you have confirmed with Dr. Hart that your lab partners and you have all completed the day's objectives, and clarified what assignment is due for the following class period.

- Many labs will require that you save your materials/samples for the following lab. It is your responsibility to ensure you have saved all required materials and samples in fridge/freezer storage. You will likely incur a grade penalty for not saving samples. Anything left in a rack or icebox on your bench with be thrown out if you are not present. Double check with your TA if you are unsure!

EXTRA CREDIT

There will be no opportunity for extra credit*

OBTAINING EXTRA HELP

Your TA will be available to answer your questions immediately before or after class, or at office hours/help sessions. Attendance at help sessions hosted by any of the TAs is strongly encouraged. Alternatively, you can submit questions on the discussion board, or by e-mail. If your schedule conflicts with the Help session times, contact Dr. Hart.

Attending Help Sessions has been associated with a grade improvement of approximately one letter (~10%)!

EMERGENCY PREPAREDNESS

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances. To get information about changes in this course consult the class Blackboard site or e-mail or phone the instructor.

Dr. Hart will go through emergency preparedness with you on day one of class, and more information can be found in the Lab safety section of this syllabus and in the First Class materials. If an emergency occurs while class is in session, you are advised to follow the guidelines of your instructor and TAs.

COURSE EVALUATIONS

During the last week of the semester, you will be provided an opportunity to evaluate this course and instructor(s) and TA. To this end, Purdue has transitioned to online course evaluations.

- On Monday of the eighth week of classes, you will receive an official email from evaluation administrators with a link to the online evaluation site. You will have one week to complete this evaluation. Your participation in this evaluation is an integral part of this course. Your feedback is vital to improving education at Purdue University. I strongly urge you to participate in the evaluation system.
- You will also receive a request from the Department of Biochemistry to evaluate your TA. TAs depend on feedback from students to improve their teaching, and these evaluations contribute to teaching improvements, as well as recognizing TAs for excellence in their positions.

What other resources might be useful?

- **CAPS Information**: Purdue University is committed to advancing the mental health and well-being of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, services are available. For help, such individuals should contact Counseling and Psychological Services (CAPS) at (765)494-6995 and **http://www.purdue.edu/caps** during and after hours, on weekends and holidays, or through its counselors physically located in the Purdue University Student Health Center (PUSH) during business hours.
- The **Disability Resource Center (DRC)** is a resource for students. You may present a "Letter of Accommodation" to Dr. Hart at any point in the semester (though sooner is always better!). If you have questions about accommodations, please contact the DRC at: 494-1247 or drc@purdue.edu .

ACADEMIC MISCONDUCT

There will be a Zero-Tolerance policy for lack of personal integrity in this course. At a minimum, cheating will result in zero points for the assignment or exam in question. It's also possible that a student will fail the class as a result. It is always best to avoid the very appearance of cheating.

Information on Purdue's policies with regard to academic misconduct can be found at http://www.purdue.edu/studentregulations/student_conduct/regulations.html

A first incident of academic misconduct will result in a minimum of two actions:

- The incident will be reported to the Office of the Dean of Students.
  Academic misconduct may result in disciplinary sanctions including expulsion, suspension, probated suspension, disciplinary probation, and/or educational sanctions.
- Zero points will be assigned as the grade for the exam, quiz, or assignment in question.
- If the first incident is considered significant enough (e.g. dishonesty on the final exam), the result may be an automatic F for the course.

A second incident of academic misconduct will result in the above actions, plus the following:

- Dr. Hart will ask that the Office of the Dean of Students support her recommendation that the student be removed from the course.

Punitive grading decisions will be made in consultation with the Office of the Dean of Students. Please note: reported incidences of academic dishonesty go on record for reference by other instructors. Further, a record of academic dishonesty is likely to influence how current/future situations are handled.

So… your House has a Chegg subscription? … Well, so does Dr. Hart…

Did you know: Depending on so-called "tutoring" services like Chegg, Course Hero, and others, can propagate misinformation about content, and lead to not only failing to learn the material yourself, but learning the material in the wrong way, or with errors.

While online study aids can be very effective, getting an online "tutor" to complete your assignments, using published answers as your own, and/or sharing any material from BCHM 309 with anyone, either online, or in person, at any time during or after your enrollment in the course, is **an infringement of Dr Hart's intellectual property and a copyright violation against Dr Hart and Purdue**. You will be considered to have engaged in malicious academic dishonesty and will be penalized accordingly, even if it **means a grade change after you have completed the course.**

Please ask Dr. Hart or your TAs for directions to online resources that are effective study aids.

To provide you with an unambiguous definition of academic misconduct, the following text has been excerpted from "Academic Integrity: A Guide for Students", written by Stephen Akers, Ph.D., Executive Associate Dean of Students (1995, Revised 1999, 2003), and published by the Office of the Dean of Students in cooperation with Purdue Student Government, Schleman Hall of Student Services, Room 207, 475 Stadium Mall Drive West Lafayette, IN 47907-2050.

“Purdue prohibits "dishonesty in connection with any University activity. Cheating, plagiarism, or knowingly furnishing false information to the University are examples of dishonesty." [Part 5, Section III-B-2-a, Student Regulations] Furthermore, the University Senate has stipulated that "the commitment of acts of cheating, lying, and deceit in any of their diverse forms (such as the use of substitutes for taking examinations, the use of illegal cribs, plagiarism, and copying during examinations) is dishonest and must not be tolerated. Moreover, knowingly to aid and abet, directly or indirectly, other parties in committing dishonest acts is in itself dishonest." [University Senate Document 72-18, December 15, 1972]

What is Plagiarism?

Plagiarism is a special kind of academic dishonesty in which one person steals another person's ideas or words and falsely presents them as the plagiarist's own product. This is most likely to occur in the following ways:

- using the exact language of someone else without the use of quotation marks and without giving proper credit to the author. **PLEASE NOTE: using the exact language of anyone else, even with quotation marks, is NEVER appropriate in most science writing that is required in this class.**
- presenting the sequence of ideas or arranging the material of someone else even though such is expressed in one's own words, without giving appropriate acknowledgment
- submitting a document written by someone else but representing it as one's own

Plagiarism on assignments is automatically detected by the SafeAssign tool on Blackboard. There will be ZERO tolerance for plagiarism in this course.

More specifically, the following are a few examples of academic dishonesty which have been discovered at Purdue University.

- substituting on an exam for another student
- substituting in a course for another student
- paying someone else to write a paper and submitting it as one's own work
- giving or receiving answers by use of signals during an exam
- copying with or without the other person's knowledge during an exam
- doing class assignments for someone else
- plagiarizing published material, class assignments, or lab reports
- turning in a paper that has been purchased from a commercial research firm or obtained from the internet
- padding items of a bibliography
- obtaining an unauthorized copy of a test in advance of its scheduled administration
- using unauthorized notes during an exam
- collaborating with other students on assignments when it is not allowed
- obtaining a test from the exam site, completing and submitting it later
- altering answers on a scored test and submitting it for a regrade
- accessing and altering grade records
- stealing class assignments from other students and submitting them as one's own
- fabricating data
- destroying or stealing the work of other students

Purdue's Honor Pledge

"As a boilermaker pursuing academic excellence, I pledge to be honest and true in all that I do. Accountable together - we are Purdue."

www.purdue.edu/provost/teachinglearning/honor-pledge.html

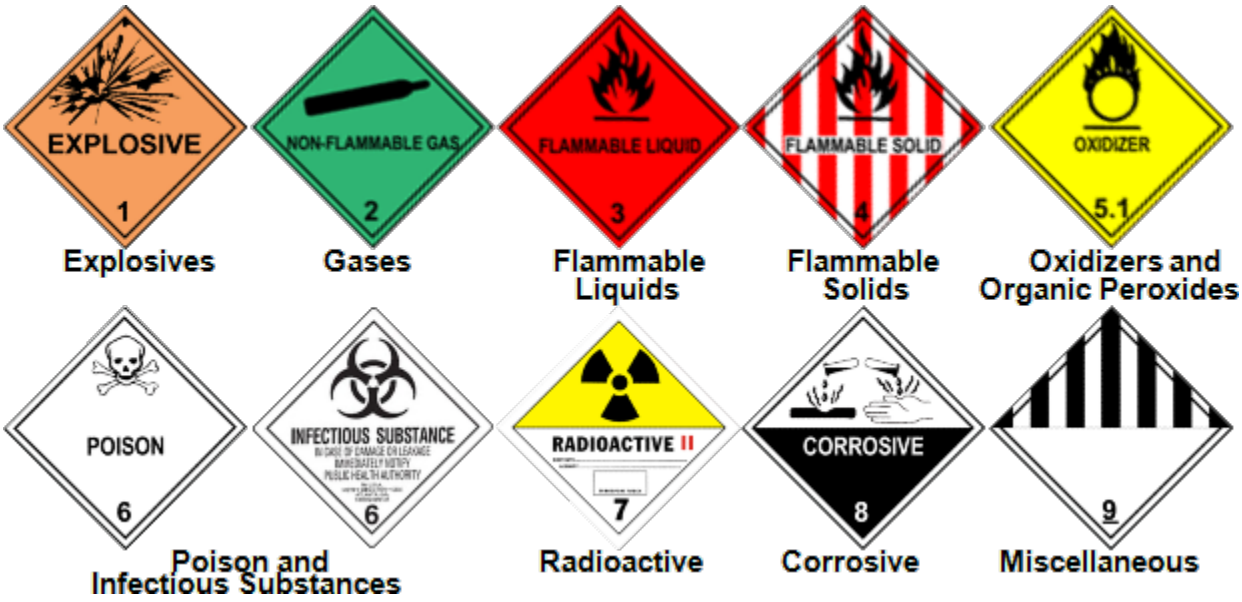
LAB SCHEDULE

Week	Date	Experiment / Topic	Written Assignment // Notes (see Blackboard for more details)
1	Jan 8/10	Lab introduction: Biochemistry boot camp // Experimental Design introduction. Lab 1	**No Pre-Lab Quiz**. Lab assignment. Begin Experimental Design Report, which is due before lab on 03/20/18 or 03/22/18.
2	Jan 15/17	Lab introduction: Acids, bases and buffers Lab 2	Lab assignment 2A: Buffer calculations Lab assignment 2B: Create a rubric
3	Jan 22/24	Lab introduction: Spectrophotometry // Experimental Design introduction. Lab 3	Lab assignment 3A: Determining concentrations Lab assignment 3B: Create a rubric
4	Jan 29/31	Lactate Dehydrogenase Purification I: Salt precipitation week 1. Lab 4a	Lab assignment 4A: Purification table (should be mostly done before you leave lab!)
5	Feb 5/7	Lactate Dehydrogenase Purification I: Salt precipitation week 2. Lab 4b	Lab assignment.4B: Partial lab report: Title, Introduction, Data
6	Feb 12/14	Lactate Dehydrogenase Purification III: Gel Filtration Chromatography. Lab 5	Lab assignment 5A: Purification table and other data Lab assignment 5B: Discussion
7	Feb 19/21	Lactate Dehydrogenase Purification II: Ion Exchange Chromatography. Lab 6	Lab assignment.6: Full Lab Report! Make sure you use the feedback from your other assignments!
8	Feb 26/28	Open Lab / Exam practice	No Pre-lab quiz.
9	**Mar 5/7**	**Midterm Practicum exam // Midterm Written Exam**	**Practicum exam (40 minutes): Protein determination (Bradford) assay. Written exam (60 minutes).**
10	**Mar 11-16**	**SPRING BREAK!!**	
11	Mar 19/21	Experimental Design Lab 7	**No Pre-Lab Quiz.** Experimental design report due via Blackboard **before this class begins**. Should be a detailed experimental protocol as instructed in class. Include background/introduction, hypothesis, method.
12	Mar 26/28	Cellobiase purification I: Salt precipitation	Lab assignment 8A: Purification table and other data Lab assignment 8B: Create a multi-part figure with legend.
13	Apr 2/4	Cellobiase purification II: Gel Filtration Chromatography	Lab assignment 9A: Updated purification table and other data Lab assignment 9B: Comprehensive introduction
14	Apr 9/11	Cellobiase purification III: Ion exchange Chromatography	BIG Lab report, should mirror format of LDH purification report. Include everything from Cellobiase purification: Intro, methods, all data and results and comprehensive discussion**.**
15	Apr 16/18	**Final Exam practicum**	**Determine the Fold Purification of an enzyme sample (80 minutes).**
16	**Apr 23/25**	Final Exam written	2 hour exam during your regular lab period.

This schedule is subject to change

Lab Safety

1. Approved **safety goggles** (with sideguards) must be worn by all persons (faculty/instructors, teaching assistants and students) in the laboratory any time there is work in progress by anyone. If you do not have safety goggles, they will be provided to you.
2. **Lab coats** must be worn by all persons (faculty/instructors, teaching assistants and students) in the laboratory any time there is work in progress by anyone. Lab coats may be purchased at the University Book Store, or Follet's. You will not be permitted to take part in any lab activity without your lab coat. All PPE should be removed before you leave the lab.
3. **Eating**, chewing gum, and/or **drinking** in the laboratory is strictly forbidden.
4. Many laboratory chemicals/reagents are **toxic**. If instructed to smell reagents, do so with great caution, and NEVER put your nose over the bottle! Avoid looking into the mouth of any reaction vessel or test tube; instead, view from the side. Never point a test tube at anyone.
5. **Proper attire** must be worn at all times. Closed-toe shoes are required at all times in the lab. The hemlines of shorts, skirts and dresses must be no higher than knee-length. Failure to adhere to the dress code will result in a grade penalty for the first occurrence, and you may be asked to leave the lab for further occurrences.
6. **Hair** that reaches the shoulders or longer must be tied back. Caps or hats must not be worn.
7. No one will perform **any unauthorized experiments**, nor will students work in the lab alone, or outside of regularly scheduled hours.
8. Keep a **clean working area**. Books, book bags, jackets etc. and paper should not clutter the workbench. Keep chairs and book bags recessed under cabinets when not in use.
9. Do not leave the lab until you have **cleaned up your work area** and returned supplies and equipment to the appropriate area if necessary.
10. Follow the guidelines of your instructor or teaching assistant when handling any **hazardous materials**. Be aware of the safety labeling on containers to identify risks associated with the materials.



11. Follow the guidelines of your instructor or teaching assistant for **waste disposal**. Dispose of the excess chemicals in the proper waste container, as indicated by the lab instructor or teaching assistant.

12. When pouring something out of a reagent bottle, always **READ THE LABEL TWICE** to be certain that you are using the correct material.

13. **Label** all chemical containers and test tubes before use to avoid mix-ups.

14. If you spill something, **clean it up (GET HELP WITH HAZARDOUS MATERIALS)!** Wash your hands immediately after skin contact with any chemical reagent. Also wash them after lab. If liquids drip down the side of the bottle, while pouring, wash the bottle off.

15. NEVER return excess chemicals to the reagent bottle.

16. Exercise care when **handling glass**.
    a. Do not use broken or chipped glassware.
    b. Do not leave pipettes sticking out of bottles, flasks or beakers.
    c. Do not attempt to remove stoppers on glass tubing by force.
    d. Hot glass must be handled with heat-resistant gloves, and any container containing heated materials must remain vented and be handled with extreme caution.

17. Do not operate **centrifuges** without supervision from instructor or teaching assistant.

GENERAL SAFETY AND FIRST AID

18. Aisles and exit routes must not be obstructed in any way. Therefore, keep the stools pushed under or next to the bench. Keep book bags and other personal items where they will not be an obstruction hazard.

19. Report all accidents of any type to your instructor immediately. This includes electrical shocks, chemical spills, and bodily exposure to chemicals, biologics and all other types of exposures and/or injuries.
    a. The instructor, in consultation with the teaching lab coordinator, if necessary, will evaluate the exposure, counsel the student, and treat the exposure as deemed appropriate.
    b. If deemed necessary, the student will be referred to PUSH for consultation/medical treatment.
    c. An Incident Report Form must be completed for all exposures and/or injuries that occur in the teaching lab (BCHM 107) and a copy provided to the student and teaching lab coordinator.
    d. In the case of ANY incident resulting in injury to a student, the student is advised to receive medical attention from PUSH. Department of Biochemistry lab personnel are not medical professionals, and medical opinions can only be obtained from PUSH.

20. An eyewash station and safety shower are located next to the sink on the north end of the lab. These should be used in the event of exposure of the eyes to hazardous materials or skin exposure to hazardous materials that cannot be managed using a faucet at the sink. Do not hesitate to use these if an exposure to hazardous material has occurred.

21. A first aid cabinet is located in the laboratory. Notify the instructor when items are used so supplies may be replaced.

22. In the case of fire in the lab, immediately notify the instructor or teaching assistant and use the RACE acronym:
    a. REMOVE anyone from danger.
    b. ALARM – activate the fire alarm first. Then call 911.
    c. CONTAIN – contain the fire, close doors and windows etc. when leaving the area.
    d. EXTINGUISH – Only if you have been trained in its use *and* it is safe for you to do so, use the fire extinguisher to control the fire.

    NOTE: There is a carbon dioxide fire extinguisher in the lab to the right of the whiteboard. Do not attempt to use it unless you have been trained in its use. It may be used on liquid fires and electrical fires only.

EVACUATION PROCEDURES

The building alarm will sound inside the building in the case of fire, or other emergency that requires your evacuation.

e. If this alarm sounds, you must evacuate the building immediately.
f. Shut off any equipment that you were using, remove personal protective equipment, gather your personal items if the situation permits and leave immediately through the main exit onto South University Street.
g. Proceed to the emergency assembly area outside NLSN. Notify your instructor if you notice that one of your lab colleagues is no longer with your group. Do not leave this area without consulting directly with your instructor.

SHELTER-IN-PLACE PROCEDURES

The outdoor all-hazards alarm will sound if you need to shelter in place due to inclement weather (including tornadoes), hazardous materials release, active shooter or other civil disturbance.

h. To shelter-in-place, follow the directions of your instructor.
i. Do not leave the building unless you are cleared to do so by your instructor.

Department of Biochemistry Teaching Laboratory (BCHM 107)

Syllabus Agreement & Safety Rules

Student acknowledgement and declaration of cooperation.

Course: BCHM 309

Semester: Spring 2019

Instructor: Dr. Hart

I have read and understand the contenet of the syllabus for this course, and agree to abide by the policies of this course.

I have read the safety rules for the Department of Biochemistry Teaching Laboratory (BCHM 107), understand all of the procedures, and agree to abide by them. I understand that failure to comply with safety procedures could result in the suspension of my laboratory privileges or disenrollment from the course.

Signed _____

Date _____

Department of Biochemistry Teaching Laboratory (BCHM 107)
Incident Report Form – Undergraduate Student

Student Name: **Major:**	**Course:** **Instructor:**
Date/Time of incident:	**Student Phone:**
	E-Mail:
Witness(es):	
Description of incident: Include the use of Personal Protective Equipment, chemical hood or other environmental control, safety equipment (attach additional pages if necessary).	
Did the incident result in an injury: Yes ☐ No ☐ **Description of injury:**	
Details of action taken:	
Did student indicate they would visit PUSH?: Yes ☐ No ☐ **NOTE: The Department of Biochemistry asks students to visit PUSH to have all injuries evaluated by trained medical professionals.**	
Emergency response information (include EH&S, fire, police, ambulance response present at the scene):	
Copy of this completed form provided to: Student: Yes ☐ No ☐ **Dr. Hart: Yes ☐ No ☐**	
Instructor Signature: **Date:**	**Student Signature:** **Date:**