

BCH 322(*Experiments in Enzymology*)
Course Outline

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BCH 322

Course Description:

A set of special experiments designed to study parameters of enzyme activity, activation & inhibition, and isolation & characterization of enzymes.

Safety in the Lab. :



Safe practices in the biochemistry laboratory are of great significance.

Students must adopt safe and skillful methods while working in the lab. To achieve this goal the student must obtain the prerequisite knowledge of properties of materials present in the lab and must be acquainted with different hazards and harmful effects associated with their improper handling.

Regulations

- Immediately inform your instructor in case of any accident.
- Do not eat, drink, chew, or smoke in the laboratory.
- Do not depart from the lab leaving an experiment unattended. If you need to leave the lab you must inform your instructor before leaving the lab.
- After finishing the experiment turn off all the equipments, clean your work bench and reshef all the equipments or chemicals.
- Not sticking to these rules will result in instant removal from the lab.

- **Precautions**
- You must come to the lab with a serious awareness of personal liability and utmost consideration for others in the lab.
- You must acquaint yourself with safety equipment location, acid-base neutralizing agents, eye wash, fire extinguisher, emergency shower, broom & dustpan and broken glass container.
- You must listen carefully to all the instructions given by your instructor. If you are unsure of anything, always ask your instructor.
- You must immediately clean all chemical spills.
- While handling all electrical and heating equipments extra precautions must be taken to prevent shocks and burns.
- Do not handle broken glassware with your bare hands.
- You must wash your hands with soap after finishing the experiment.



Personal clothing



- Selection of clothing for the laboratory is generally left to the discretion of the student. However, due to the harmful nature of some chemicals, it is in the best interest of the student to wear proper and suitable clothing. You must wear a lab coat to help keep clothes protected. Open toed shoes must not be worn because they cannot protect you against chemical spills. Long hair should be tied back to avoid interference with motion or observation.



- **Equipments**

Equipment must be placed in a safe and secure manner. Hot plate must be placed in safe location and kept away from the edge of the bench to reduce chances of body contact.

- **Glassware Handling**

Glassware in the lab is generally delicate and fragile, and if not handled properly, may cause serious injuries. Do not use any chipped or broken glassware. After finishing the experiment, all glassware must be cleaned and kept back at the proper place.



- **Chemicals:**

In the experiments you will be using different Chemicals. Hence care must be taken to avoid skin contact. While handling these chemicals, avoid eye and face contact. In case of acid or base contact with your skin, wash it with large amount of clean, cold water and inform your instructor immediately. For your own protection, neutralize acid or base spills before cleaning them up.



- **Laboratory Notebooks**

For all laboratory experiments use a bound notebook to keep record of all primary data and observations. You must organize your notebook every week before coming to the lab by writing the title of the experiment on a new page, with important equations or formulae from the lab manual, and all necessary calculations involving solution preparations, molar masses, etc.

Try to understand theoretical concepts and particular instructions given by your instructor before the experiment. The lab notebook must have a record of every experiment. The lab notes should be written in a manner that other people could understand them. Excellent note taking in the lab is an important skill that can be learned with little effort and practice.

- **Guidelines to be followed**

- Carry your notebook to the lab for each experiment.
- Number all the pages in sequential order.
- Use your notebook to record values directly and do not use loose scraps of paper.
- Mention each measured quantity by its name and indicate the units.
- Simply strike through the sentence and write the new sentence next to it, if you make a mistake in your notebook.
- Tables are very useful to simplify the data entry; they should be prepared in advance before starting the experiment.
- Do not depend on your memory and write down all observations for example color and phase changes, etc.
- Last but not the least, you must write a brief conclusion of your experiment. It should address the objectives of conducting the experiment

Course Grading :

- In lab short quizzes weekly -15 marks
- Evaluation of Lab reports weekly -15 marks
- Midterms (Theoretical -10 marks and Practical -15 marks)
- Practical performance-5 marks
- final exams (Theoretical -15 marks and Practical -25 marks)



How To write a scientific report?

The laboratory reports are major written assignments and should be written in the form of a scientific paper. The laboratory reports should contain the following sections:

- Title Page
- Brief Introduction
- Materials and Methods
- Results
- Discussion
- References



All of the laboratory reports are expected to be well written, typed in English. Follow the following guidelines for each section to write a lab report.

Introduction section:

This part should consist of any theoretical background information pertinent to understand your report. This section should be around 30-40 lines.

Materials and Methods section:

In this section you will write the material and methods that you used, you must also mention exact volumes, amounts, incubation times, and any modifications from the procedure mentioned in the manual.

Results section:

In this section of your lab report, you should report all your results that you get from your experiment such as calculations, exact volumes, amounts, incubation times, etc.). You should present them in a **tabulated form** so it will be easy for quick reference. **You must number and label all the tables and figures (graphs, diagrams).** This way it will be easy for you to refer to them in your discussion section. You should also include your sample calculations (if any) in the result section

Discussion section:

In this section you are required to give a thorough description of what happened in the experiment. The discussion section is also where you interpret your results and make conclusions. You should refer to your tables and diagrams while explaining your results. You should compare your results to expected values (calculated or from the literature). Even if you obtained unexpected results, the discussion section is the section to justify or explain the reasons why you have obtained such results. Please remember how you interpret your results carries more weight than the results themselves.

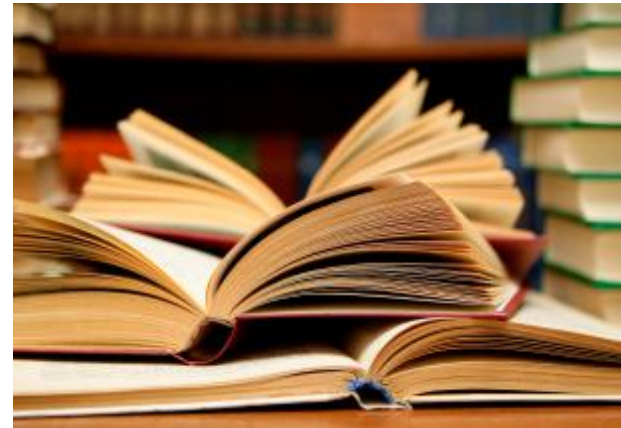
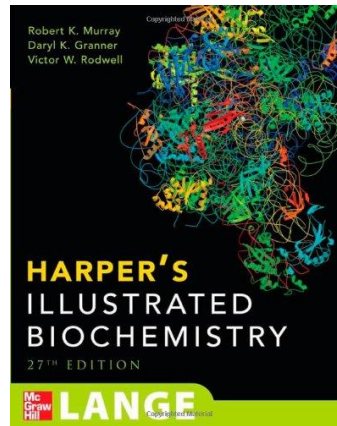
References section:

In this section you will provide an alphabetical • listing (by first author's last name) of the references that you actually cited in the body of your report.

Questions section:

In this section you will answer all the Questions after the experiment.

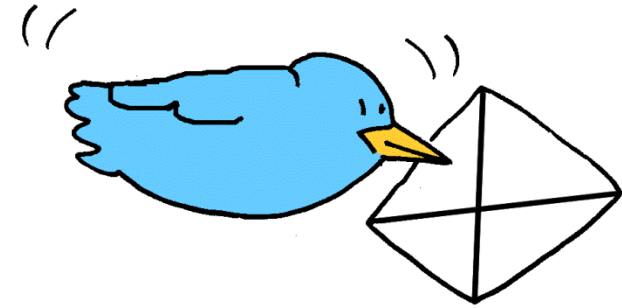
Course References:



- - G.Douglas Crandall, **Selected exercises for the Biochemistry Laboratory**, Chapter 5, Oxford University Press, New York. 1983
- - Lehninger A.L. , (1993), **principles of Biochemistry**, Worth publisher,inc. , New York
- - Paum, S.J. and Bowen, W.R. (1972), **Exercises in organic and biological chemistry**, The Macmillan Company, 566 Third Avenue, New York 10022.

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Thank You 😊