

CHEM 124L Syllabus General Organic and Biochemistry Lab Summer 2013

Instructor: Frank Tyminski, MEYR 564, x 52552, tyminski@umbc.edu
Office Hours: By appointment
Text: Bettelheim, Frederick A. and Joseph M. Landesberg. Laboratory Experiments for Introduction to General, Organic, and Biochemistry. 2010, Seventh Edition; Brooks/Cole.

Laboratory

Notebook: Student Lab Notebook (Carbonless Paper)

Prerequisite: A grade of C or better in CHEM 123 is an absolute prerequisite for CHEM 124L. If you remain enrolled in CHEM 124L without this prerequisite you will receive an F for a grade.

Co-requisite: CHEM 124 is a prerequisite or co-requisite for the lab course CHEM 124L. If you are taking CHEM 124 as a co-requisite and drop it, you must also drop CHEM 124L. Failure to do so will result in an F for a grade for CHEM 124L.

Class Meetings: Lab lectures will be given each Monday and Wednesday at 1-1:50pm in Meyer 256
Lab class meet each Monday and Wednesday at 2:00pm – 6:00pm in MEYR 278

Course Material and Syllabus:

The laboratory course is intended to acquaint students with common laboratory practices used to investigate chemical systems. The student gets the opportunity to observe first-hand chemical phenomena that are described in CHEM 123 and CHEM 124. Working in a chemical laboratory requires safe handling of toxic and/or corrosive chemicals. Be sure to read carefully the standard safety procedures for UMBC laboratories on the last page of this syllabus. Also note specific warnings indicated by exclamation points in the margin for each experiment.

Attendance is required at laboratory lectures on Tuesdays. Theory, procedures, and safety considerations for the next week's experiment will be discussed.

Learning Objectives:

This course is intended to acquaint students with common laboratory practices used to investigate laboratory systems. The student observes first hand chemical phenomena that were described in CHEM 123.

- Purpose of the steps and procedures in the experiments both practically and how the procedure relates to theory
- Background theory of reaction equations, stoichiometric, kinetic and thermodynamic calculations
- Safety awareness of toxic and corrosive properties of chemicals used
- Names and formulas of compounds used in the experiments

Experiments:

<u>Dates</u>	<u>Lecture</u>	<u>Lab</u>	<u>Reading & Procedure</u>
July 8	Introduction Lab Safety Check-In	Check-In	Pg. xi-xii Handout & Video
July 10	Measurement & Significant Figures Density	Laboratory Techniques Density	Exp. #1 (Pg. 1-12) Exp. #2 (Pg. 19-23)
July 15	pH and Buffers	pH and Buffer Solutions	Exp. #18 (Pg. 207-212)
July 17	Titrations	Analysis of Vinegar By Titration	Exp. #19 (Pg. 219-222)
July 22	Alcohols and Phenols	Classification & Identification Of Alcohols and Phenols	Exp. #25 (Pg. 301-306)
	Aldehydes and Ketones	Classification & Identification Of Aldehydes and Ketones	Exp. #26 (Pg. 313-320)
July 24	Carboxylic Acids	Properties of Carboxylic Acids And Esters	Exp. #27 (Pg. 329-332)
	Amines and Amides	Properties of Amines and Amides	Exp. #28 (Pg. 341-345)
July 29	LAB EXAM #1 Preparation of Aspirin	----- Preparation of Acetylsalicylic Acid (Aspirin)	----- Exp. #30 (Pg. 365-368)
July 31	Lipids	Preparation of a Soap	Exp. #34 (Pg. 413-415)
August 5	Amino Acids	Separation of Amino Acids By Chromatography	Handout
August 7	Enzymes	Properties of Enzymes	Exp. #41 (Pg. 489-495)
August 12	Emulsification	Preparation of Hand Cream	Exp. #35 (Pg. 423-425)
August 14	LAB EXAM # 2	-----	-----

Assignments:

Your assignment each day when you come in for lab is:

- Laboratory "write-up" for the scheduled experiment(s).
- The "carbon" copy from the previous week's lab to be graded.
- Completed Data Sheet from previous week's lab.

Before coming to each lab each class you should read the appropriate material in your textbook, and complete the Pre-Lab questions assigned for that chapter.

You must enter the laboratory each week with a clear understanding of the procedures that you are to do and why you are to do them. The TA and/or the instructor may ask you questions about the lab at any time. If you cannot answer these questions satisfactorily, you may be asked to stop the experiment.

The Pre-Lab Review Sheet must be completed **BEFORE** you come to lab and handed to the TA upon entering the laboratory before starting the experiment.

BE PREPARED FOR LAB!!

NOTE: LAB REPORTS ARE DUE ONE WEEK AFTER THE LAB...LATE LAB REPORTS WILL BE PENALIZED 5 POINTS/DAY LATE. Late reports must be signed and dated by a faculty/staff person and placed in your TA's mailbox.

Laboratory Notebook:

Your lab notebook is intended to be a substantive record of work performed in the laboratory, in which you must record the data/results obtained from your experiments. It should contain sufficient information so that **anyone** reading your notebook would be able to reproduce your experiments, and evaluate your conclusions. In general, scientific notebooks follow a basic format similar to that provided below.

Notebook Format:

- 1) Table of Contents: Leave a few pages at the beginning of your notebook so that you can list the individual experiments, the dates on which they were performed, and the pages on which the relevant procedures and data may be found.
- 2) Experiments: **Each lab exercise should be dated and initialed on every page. USE INK FOR WRITE-UPS. DO NOT USE PENCIL!!**
 - € Title (5pt) Should be listed both in the Table of Contents and on the first page of the experimental section.
 - € Objective (5pt) A brief (2 to 3 sentences) description of the purpose and goals of the analyses to be performed.
 - € Procedures (25pt) An itemized list of the sequential steps performed, including information relevant to the preparation of samples, standards, and reagent solutions, and the equipment utilized (left side of page).
 - € Data (35pt) Report sheets are to be initialed by your TA after completing the lab. A final completed data sheet (graphs, tables etc.) to be turned in with the final lab report to be graded.
 - € Calculations (20pt) Provide any necessary calculations for the experiment (i.e., solvent volume calculations to provide a specific concentration solution from a certain amount of solute) in your laboratory notebook. Your calculations should be clear enough so that it is obvious how the final result was achieved.
 - € Observations (10pt) Recording observations while conducting the experiment (e.g. solution turned cloudy, a precipitate formed etc.)

Grading:

Pre-lab Review Sheets (15%)

Pre-lab questions must be completed before class and handed in immediately upon entering the laboratory.

Lab Notebook (20%)

Lab Notebook for an experiment must be initialed by your teaching assistant (TA) before you the lab. Completed data sheets and graphs for each experiment **are due one week after** the date of the experiment.

Quizzes (15%)

Weekly quizzes during lecture period on the previous week's experiments. If you are late to class for a quiz or absent, **you may receive a zero for that quiz.**

Exams (25%)

There will be a total of two exams for this course. It will cover the appropriate material discussed in lecture, lab, and syllabus.

Post Lab Questions (15%)

Post lab questions will be assigned each week and handed in with your lab report.

TA Evaluation (10%)

Based on student's preparation for class, which include following safety guidelines and taking appropriate notes.

Final Grades:

A	=	100 – 90
B	=	89 – 80
C	=	79 – 70
D	=	69 – 60
F	=	Below 60

Absences:

LABORATORY ATTENDANCE IS MANDATORY.....

THERE ARE NO MAKE-UP LABS

As this is a compressed summer schedule, all labs must be completed to satisfactorily pass this course.

**UNEXCUSED MISSED LABS WILL RESULT IN A
"ZERO" FOR THAT LAB....**

Administration:

You are responsible for checking all deadlines for changes in audit/pass-fail grading status and for adding, dropping and withdrawing from the class. For all quizzes and the final exam, only non-graphing calculators are allowed (e.g. TI 36X, TI 30Xa, TI 30XIIS or TI 30XIIB). Cell phones and personal music players are prohibited in the laboratory. **Email messages MUST be sent to BOTH your teaching assistant (TA) and Mr. Tyminski.**

Academic Integrity:

"By enrolling in this course, each student assumes the responsibilities of an active participant in UMBC's scholarly community in which everyone's academic work and behavior are held to the highest standards of honesty. Cheating, fabrication, plagiarism, and helping others to commit these acts are all forms of academic dishonesty, and they are wrong. Academic misconduct could result in disciplinary action that may include, but is not limited to, suspension or dismissal. To read the full Student Academic Conduct Policy, consult the UMBC Student Handbook."

Safety:

Safety is a primary concern in the chemical laboratory. Chemicals are almost all potentially dangerous. However, with the correct precautions, all the work you will be asked to do may be performed safely. It is important that you know how to handle both the chemicals and the apparatus you will be using. In addition, you must know what to do if an accident occurs. Your text has a general section on safety and special cautions associated with each experiment. Read them and learn them. Anyone who fails to follow correct safety procedures will not be permitted to complete the course and will not receive credit for the course.

The following rules generally apply to all laboratory courses at UMBC. In addition in each of your laboratory courses the professor will outline rules and procedures and the textbook will have general sections on safety and first aid and, usually, special cautions associated with each experiment. Pay heed, read, and learn all precautions. Anyone who does not follow correct safety procedures will not be permitted to complete department laboratory courses. Safety information from the American Chemical Society is presented in videos at <http://www.umbc.edu/chem/general/admin.php>.

Personal Protection

1. You must wear eye protection in lab at all times. Even if you are not working, others may be. Safety goggles are required for general chemistry and organic chemistry lab courses; safety glasses are acceptable for other lab courses. Eye protection must be worn over prescription glasses. Eye protection can be purchased in the bookstore.
2. Do not wear sandals or other open shoes, midriff tops, or shorts. Long hair must be tied back. Wear old clothes to the laboratory or use a lab coat. Store personal effects in the areas provided not at the bench.
3. Treat all chemicals as toxic: do not taste them or touch them.
4. Wear protective gloves as recommended. Realize different glove materials are required depending on the chemical exposure and must be matched to the properties of the chemical. Latex gloves only offer protection against some solids and weak aqueous corrosives so nitrile gloves are provided for the organic labs.
5. Know that the immediate response to spills of corrosives on your person is to wash the area thoroughly with water. Do not wash chemicals from the skin with organic solvents; use water only.

Safe Laboratory Practices

1. Know the location of all safety equipment in the lab such as fire extinguishers, eye-wash, shower, and acid-spill and base-spill wash bottles.
2. Do not dispose of organic solvents, mercury, or strong acids or bases in the sink. Waste chemicals are disposed of in separate waste cans. Spilled mercury can be vacuumed into filter flasks. Solid wastes, including paper towels used for organic spills, are disposed of in the dedicated bottle.

3. Broken glass must first be washed free of water soluble residue or rinsed free of organic residue with acetone into the appropriate waste bottle, whichever is applicable. Residue-free glassware is then disposed of in the dedicated boxes. Trash is the only material discarded in the trash cans.
4. Do not leave reactions unattended.
5. Social visitors are prohibited from entering the instructional laboratories.
6. Never add anything TO concentrated acid, caustic or strong oxidant. Instead add acid, caustic or oxidant slowly and carefully to the other reagents. Do not hold your face directly over a container when noting the odor. Instead waft vapor carefully toward you with your hand.
7. Do not pour reagents back into stock bottles. Take only what you need.
8. Wipe up spills immediately. At the end of the day's work, sponge off your bench and leave it clean.