Syllabus

CHEM 111.02 A, B, & C

INTRODUCTION TO CHEMISTRY I LABORATORY

Spring Semester: 2022

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Office Hours:
Wed.: 3:00 pm – 5:00 pm
Thurs.: 10:00 am – 12:00 noon
Fri.: 10:00 am – 11:00 am

Course Description:

All laboratory procedures can be found on D2L. Before coming to lab, you are expected to have diligently studied the experiment and outlined the procedure in your laboratory notebook. You should bring your laboratory notebook, and safety goggles to all labs. Laboratory experiments should be done during the assigned laboratory period. Any work outside of this period must be approved by the lab instructor; a chemistry faculty member must be available to supervise your work, and another student must be always in the lab with you. The pre-lab assignment should be completed but will not be handed in to the instructor. After a brief lab lecture and before the actual lab begins, a brief, 10-minute quiz will be given. The quiz will consist of 5 questions (5 pts. total) on any aspect of the days experiment. Open lab notebooks are only allowed.

The laboratory component of CHEM 111 is designed to give you hands-on experiences that enhance learning by application. **Students MUST prepare for, carry out, and report on ALL lab experiments or activities in CHEM 111!**

LAB: (250 pts)

Each experiment (9 experiments), performed in the laboratory, will be introduced in recitation/lab. The basic concepts and theory for the lab as well as any calculations or graphs needed for each experiment will be discussed during this time.

Laboratory Objectives:

At the completion of CHEM 111 Laboratory, you should be able to….

- Demonstrate the proper laboratory safety, including chemical waste disposal, when working in the lab
- Keep a neat and organized record of laboratory data in a notebook
- Follow instructions and perform experiments safely and completely
- Observe, Record, Analyze, Interpret, Convey experimental data obtained

Required Materials:

- Laboratory Goggles or, Safety Glasses with side shields
- Laboratoy notebook
  - Each student must keep a laboratory notebook and record all experimental information during the lab period. Laboratory notebooks may be examined on a regular basis to

assure the proper recording of experimental data and procedures; however, the main criteria for a good notebook will be 10 min., pre-lab quizzes (5 points each) before each lab. Open lab notebooks are allowed, so if you keep a good notebook, the quizzes will be straight forward. Remember, only 10 min. per quiz. Carefully follow the instructions below:

- Laboratory Procedures: Handouts *via* D2L
- Scientific calculator capable of exponential notation, square roots, and logarithmic functions

Laboratory Course Evaluation:

Grading

Lecture:

Assigned Online Homework (15 points each)	10	150 points
Quizzes (15 points each)	7	105 points
Exams (100 points each)	3	300 points
Final (195 points)	1	195 points
	Lecture subtotal	**750 points**

Lab:

Lab Notebook Quizzes (40 points: 5 pt./quiz)	8	40 points
Lab Reports (20 points each)	9	180 points
Lab Final (30 points)	1	30 points
	Lab subtotal	**250 points**

Total for the class: 750 + 250 = 1000 points

Note

A grade of 60% is required in lab to pass the course. A grade of 60% is required in lecture and recitation to pass the course.

Note

Class participation will be taken into consideration during final grading.

Note

To pass CHEM 111, you must have a passing grade in the lecture/recitation component (at least D-). Grade of C- or better is required to enroll in CHEM 112 (Grade of C or better is required to enroll in CHEM 112 for chemistry majors).

Lab Attendance:

Attendance at each laboratory session is mandatory. Only valid excuses will be accepted in order to make up labs. In the event of an anticipated excused absence, arrangements should be made to make up work ***prior*** to the absence; if not, a missed lab will result in a **ZERO** for that lab missed! Students are not allowed to work by themselves when there is not a lab in session. You are expected to have read the procedure thoroughly prior to each lab and be prepared to work in the laboratory.

Tentative Laboratory Schedule:

- **Monday Lab (111.02C)**

	Title – Experiment	**Experiment #**
Jan 24	Safety In the Chemistry Lab & Check-In / Measurements and Density – Part II	Exp 1
Jan 31	Formula and Composition of a Hydrate – Part A	Exp 2
Feb 7	Identification of Common Chemicals	Exp 6 **(2 Weeks)**
Feb 14	Identification of Common Chemicals	Exp 6
Feb 21	Titration of Acids and Bases - Part B	Exp 7
Feb 28	Gravimetric and Volumetric Analysis - Part A & B	Exp 8 **(2 Weeks)**
Mar 7	**Spring Recess / No Lab**	
Mar 14	Gravimetric and Volumetric Analysis - Part C	Exp 8
Mar 21	Evaluation of the Gas Law Constant	Exp 10
Mar 28	Thermochemistry: Heat of Reactions	Exp 11
Apr 4	Spectrophotometric Analysis of Aspirin – Part B	Exp 12 **(2 Weeks)**
Apr 11	Spectrophotometric Analysis of Aspirin – Part C	Exp 12
Apr 18	**Lab Final - based on Experiment 6**	**Timed test/Check-out**
Apr 25	Molecular Models and Covalent Bonding / Theoretical Lab	Exp 13
May 2	**No Lab**	

Tentative Laboratory Schedule:

- **Tuesday Labs (Sections 111.02 A and 111.02B)**

	Title – Experiment	**Experiment #**
Jan 18	Safety In the Chemistry Lab & Check-In	Safety/Check-In
Jan 25	Measurements and Density – Part II	Exp 1
Feb 1	Formula and Composition of a Hydrate – Part A	Exp 2
Feb 8	Identification of Common Chemicals	Exp 6 **(2 Weeks)**
Feb 15	Identification of Common Chemicals	Exp 6
Feb 22	Titration of Acids and Bases - Part B	Exp 7
Mar 1	Gravimetric and Volumetric Analysis - Part A & B	Exp 8 **(2 Weeks)**
Mar 8	**Spring Recess / No Lab**	
Mar 15	Gravimetric and Volumetric Analysis - Part C	Exp 8
Mar 22	Evaluation of the Gas Law Constant	Exp 10
Mar 29	Thermochemistry: Heat of Reactions	Exp 11
Apr 5	Spectrophotometric Analysis of Aspirin – Part B	Exp 12 **(2 Weeks)**
Apr 12	Spectrophotometric Analysis of Aspirin – Part C	Exp 12
Apr 19	**Lab Final - based on Experiment 6**	**Timed test/Check-out**
Apr 26	Molecular Models and Covalent Bonding / Theoretical Lab	Exp 13

Safety is very important in the laboratory:

General safety guidelines will be presented in the laboratory and should be followed throughout the duration of the laboratory experience. Specific safety precautions for each experiment will be covered before each lab. Failure to follow safety guidelines is reason for dismissal from a lab and a grade of ***zero*** for the experiment. Additional laboratory guidelines including notebooks and reports are covered in the handouts.

The Laboratory Notebook:

The laboratory notebook is a permanent record of your work in the laboratory. You must have your notebook with you to work in the lab. All notebooks must be permanently bound. All entries should be in ink. Each page must be consecutively numbered. As each page is completed you should sign/initial and date the page. The procedure must be outlined in the notebook and the safety precautions listed before coming to lab. All data must be recorded in the notebook using correct significant figures and proper units. Never write data on another sheet of paper with the idea of transferring it to the notebook. Notebooks should be relatively neat and orderly; however, data should never be recopied into another notebook. If an error is made, do not obliterate the data (also do not use white out, tear out pages or tape in new pages). Draw a single line through any errors and write the correct data.

The notebook is a record of your work as it is done. The notebook should be kept in such a way that the instructor can turn to any experiment and tell exactly what you did during the experiment. All data must include the appropriate units and be labeled to identify the data. All calculations, graphs, tables and assigned questions must be included in the notebook. All lab notebooks should be reviewed and initialed by the instructor at the end of each laboratory period.

A conclusion will be required for some lab reports. The conclusion should be one paragraph. It should state the major results of the experiment. This statement of results should agree with the purpose of the experiment written at the beginning of the report. This should be followed by a statement describing whether you are confident in the results. The remainder of the conclusion should be an argument to convince the reader why you feel your results are appropriate or not. This argument can refer to the agreement between multiple trials, agreement with other student results, trends in the data such as a linear graph or other observations from the experiment.

Notebooks should contain the following criteria:

1) Top of each page: title, page#, date, name(s)
2) Purpose: describe what is measured or determined (1-2 sentences)
3) Brief outline of the procedure (bulleted or narrative format)
4) Data presentation in table format (include: significant figures, labels and units)
5) Results: sample calculations and quality of results (statistics)
6) Graphs: title, labels, units (**Note:** recording of the post lab questions or conclusion is not required!)
7) Format: organization, neatness, completeness

Lab Reports:

Once an experiment has been completed, a lab report must be submitted for grading. Templates for each experimental lab report will be available on D2L.The lab reports should be typed neatly with all required

areas completed. Sample calculations can be typed. Calculations can also be hand-written. Any graphs associated with the lab need to be attached to the lab report as well. **Lab reports should be printed and hand-in to the lab instructor. They will be due a week after the experiment is completed.** Lab reports submitted late will receive 50% of the grade. ***If lab reports are not submitted at all, they will receive a grade of zero.***

Lab Final: **A timed lab final, which will be based on Experiment 6, will be performed in the laboratory at the end of the semester.**

TITLE IX RESPONSIBILITIES FOR FACULTY:

Millersville University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to meet this commitment, comply with Title IX of the Education Amendments of 1972, 20 U.S.C. §1681, et seq., and act in accordance with guidance from the Office for Civil Rights, the University requires faculty members to report to the University's Title IX Coordinator incidents of sexual violence shared by students. The only exceptions to the faculty member's reporting obligation are when incidents of sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a University-approved research project. Faculty members are obligated to report to the person designated in the University Protection of Minors policy incidents of sexual violence or any other abuse of a student who was, or is, a child (a person under 18 years of age) when the abuse allegedly occurred.

Information regarding the reporting of sexual violence, and the resources that are available to victims of sexual violence, is available at www.millersville.edu/titleix.

Counseling Reminder

Students sometimes face mental health or drug/alcohol challenges in their academic careers that interfere with their academic performance and goals. Millersville University is a caring community and resources are available to assist students who are dealing with problems. The Counseling Center (717-871-7821) is an important resource for both mental health and substance abuse issues. Additional resources include: Health Services (717-871-5250), Center for Health Education and Promotion (717-871-4141), Campus Ministries, and Learning Services (717-871-5554).
