



General Chemistry I Lab

CHM 1045L (CRN 10625)
1 credit hour

Class: Wednesday 10.00-11:45 AM, Academic Building 7 (AB7) Room 316

Instructor: Dr. Rebekah Brosky
Office Location: 461B Library East

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Office hours : T,R 11.00 AM-1.30 PM
W 3.00-6.00 PM
other times by Canvas mail appointment

General Information

Course Description: Intended for science majors. Laboratory experiments related to principles discussed in the lecture class of General Chemistry I. Experiments include measurement and accuracy in the laboratory, determination of density, indirect gravimetric determination of a metal after an oxidation-reduction reaction, determination of the formula weight of an unknown acid, identification of an unknown gas by measuring its' formula weight, enthalpy measurements, conservation of mass, and solubility.

Prerequisites: MAC 1105 with a minimum grade of C or Accuplacer Coll. Math Subscore test with a minimum score of 066. **Corequisite:** CHM 1045.

Student learning goals: Students will become familiarized with the fundamental laws of chemistry including states of matter, atomic and molecular structure, the periodic table, stoichiometry, theories of chemical bonding, acid-base reactions, and the gas laws. The curriculum for CHM 1045 lecture is inquiry based that emphasizes active learning strategies. Students must also take a concurrent laboratory section during the same semester (CHM1045L). The development of problem solving and critical thinking skills are strongly emphasized. Please note that CHM 1045 is the standard course for science majors and biomedical pre-professionals (including pre-meds, PT, OT and nursing). For some students (lacking good algebra skills and/or a background in high school chemistry) an introductory chemistry course may be needed before engaging CHM 1045. If you need to take an “intro” course, please note that most science and pre-professional programs do not accept “Intro to Chem” as a substitute for CHM 1045.

Materials: Items 3- 5 are required for each class.

1. **Laboratory Manual:** “General Chemistry I Laboratory Experiment Packet” from CANVAS (in Course Module)
2. **Scientific calculator:** Root, log, exponent scientific notation and y^x keys, statistical functions such as standard deviation and linear regression are also required.
3. **Laboratory Notebook:** Permanently bound laboratory notebook. No spiral bound or removable pages; composition notebooks are acceptable. Quad ruled will make drawing graphs and data tables easier.
4. **Safety Goggles:** With side splash protection. Must meet ANSI Z87.1 requirements.
5. This course is on the FGCU’s Canvas website. You can access and download this syllabus and posted lecture materials. CANVAS Website address: <http://canvas.fgcu.edu>

Course Policies and Expectations

Students are expected to adhere to the following:

Lab Safety: Everyone must wear safety goggles and shoes that cover the entire foot (no sandals, clogs, ballet flats or flip flops). Additionally you must wear long pants and a shirt that covers the shoulders (Tee shirt). You will NOT be allowed to continue the experiment and will receive a “0” for the experiment if you are not equipped appropriately and/or heed all safety warnings. MSDS lab safety books are available. You will NOT be able to participate in any lab without first submitting a signed safety contract.

Attendance Policy: Attendance is mandatory. An unexcused absence for any laboratory class will result in a **penalty of 10% of the final grade**. Students who acquire two or more unexcused absences are advised to withdraw from the course. Official documented proof is required to attain an excused absence, and must be presented no more than 2 days after the missed lab. Excused absences are only granted for documented, unavoidable situations which prevent the student from being present. A make-up day is scheduled for the last week of classes. Students will be allowed to make-up up to one missed experiment. All make-ups are at the professors discretion and are not guaranteed.

- If you miss 1 lab: Write “Missed Class” at the beginning of that experiment in your lab notebook. You may use your partner’s data to complete your notebook data tables and assignments, **penalty of 10%** of the final grade.
- If you miss 2 labs: **Penalty of 20%** of the final grade.
- If you miss 3 labs: **Results in an F for the course.**

Tardiness will not be tolerated. Students arriving late may lose participation points and those more than 15 minutes late will not be permitted to conduct the experiment.

Academic Behavior Standards and Academic Dishonesty: All students are expected to demonstrate honesty in their academic pursuits. The university policies regarding issues of honesty can be found in the FGCU Student Guidebook under the ***Student Code of Conduct*** and ***Policies and Procedures*** sections. All students are expected to study this document which outlines their responsibilities and consequences for violations of the policy. The FGCU Student Guidebook is available online at <http://studentservices.fgcu.edu/judicialaffairs/new.html>

Honors Code: ANY incident of cheating on exams, or discussion questions, quizzes, or deliberately misrepresenting reports of assignments will result in a “0” grade for that assignment and possibly an “F” grade

for the entire course. **In addition, you WILL be referred to the Judicial Department of the Dean of Students' Office for violation of the Student Code of Conduct.**

Disability Accommodations Services: Florida Gulf Coast University, in accordance with the Americans with Disabilities Act and the university's guiding principles, will provide classroom and academic accommodations to students with documented disabilities. If you need to request an accommodation in this class due to a disability, or you suspect that your academic performance is affected by a disability, please contact the Office of Adaptive Services. The Office of Adaptive Services is located in Howard Hall 137. The phone number is 239-590-7956 or TTY 239-590-7930

Student Observance of Religious Holidays: All students at Florida Gulf Coast University have a right to expect that the University will reasonably accommodate their religious observances, practices, and beliefs. Students, upon prior notification to their instructors, shall be excused from class or other scheduled academic activity to observe a religious holy day of their faith. Students shall be permitted a reasonable amount of time to make up the material or activities covered in their absence. Students shall not be penalized due to absence from class or other scheduled academic activity because of religious observances. Where practicable, major examinations, major assignments, and University ceremonies will not be scheduled on a major religious holy day. A student who is to be excused from class for a religious observance is not required to provide a second party certification of the reason for the absence.

For further information please read the General Counsel Policies at:

<http://www.fgcu.edu/generalcounsel/policies-view.asp>

Assignments and Grading

Assignment Descriptions:

Laboratory Notebook Prelabs

In your laboratory notebook, a Prelab must be completed for each experiment and it ***must be completed BEFORE you come to lab***. The following items must be addressed in a Prelab:

- I. Title of experiment
- II. Goal of the experiment (purpose and specific aims of the experiment)
- III. Procedure (bulleted/numbered instructions for how to conduct the experiment)
- IV. Hazards (list any hazards that are relevant to the experiment. If there are no specific hazards for a given lab, write "Hazards: N/A" or "There are no significant hazards for this lab.")
- V. Data/Results (Set-up organized data tables and be ready to input data from experiment)

Laboratory Notebooks

Your laboratory notebook will be assessed on content and organization. Your laboratory notebook will be periodically assessed and may be collected at the end of the semester.

- Everything in the lab notebook should be written in pen, and errors/mistakes should be crossed out with a single line (no white-out, scribbling, permanent marker, etc.)
- Each page should be labeled with respect to the name of the experiment
- Each section for a given experiment should be labeled as either *Prelab* or *Data*
- Data should be recorded in organized tables
- Every page should be numbered. The first page of the notebook should be a table of contents. Experiment one should start on page 2 or 3 of your laboratory notebook.
- **After each experiment you must complete any calculations and answer any discussion questions in the notebook.** For the notebook, the discussion question answers should be short answers. Completing the post lab calculations will help you complete your CANVAS postlab quizzes.

CANVAS Prelab Quizzes

You must answer CANVAS Prelab questions about each experiment before you perform the experiment. The questions ***must be completed BEFORE you come to class*** and you will have access to the online assessments through CANVAS for one week preceding an experiment. The Prelab assessments will be based on excerpts from the lab manual and associated reading in the textbook. The prelab quizzes may include calculations based on data similar to data you will collect in lab.

CANVAS Postlab Quizzes

CANVAS Postlab questions ***must be completed AFTER you finish each experiment*** and you will have access to online assessments through CANVAS for one week following an experiment. The Postlab assessment will be based on results, calculations, data interpretation, discussion questions, and main conclusions from the experiment.

Formal Report

You will be assigned TWO formal lab reports (30 point each) this semester. The lab report must be typed and submitted via CANVAS dropbox. You must submit your own unique report in your own writing. All formal lab reports will be submitted to turnitin.com for plagiarism. The structure of the lab report is outlined below:

1. **Scientific title (2 points):** Contains approximately 4-6 key words that describe the experiment and its purpose. Include your name, partner's name, and date of experiment
2. **Abstract (5 points):** No longer than 1 double-spaced page (1/2 single-spaced page). In a paragraph format include:
 - brief background information on system/reaction/experiment (2-4 sentences)
 - brief goal of experiment (1 sentence)
 - brief description of experimental procedures (1-2 sentences)
 - brief description of results and possible points of error (2-3 sentences)
 - a summary sentence on what was learned (1 sentence)

Note that the abstract should act to summarize the entire paper and contain only the most important points.

3. **Materials and Methods (3 points):** Describe the procedures and materials used to conduct the experiment in a paragraph format (no longer than 1 double-spaced page).
4. **Results (15 points):** Data must be presented in table/graph form.
 - Is the data table logical and orderly?
 - Is the data table complete?
 - Are the correct units being used?
 - Are correct significant figures consistently used?
 - Are the graphs (if any) correctly drawn?
 - Show one sample calculation for each type, with data values inserted.
 - Show an Error Analysis, which consists of Mean and Standard Deviation.

5. **Discussion (10 points):**
 - In a paragraph format discuss the broader implications of the experiment and answer any questions posted by your instructor. Each answer should be at least 4 sentences long, a full paragraph.

NOTE: When submitting formal lab reports, copying from the lab manual is PLAGIARISM and is subject to the University's academic dishonesty policy (and penalties)!

Grading Policy: Your final grade will be calculated according the following categories

13 In-class lab activities/Participation (5 points each)	65 points	12.95%
10 Laboratory Notebook Prelabs (5 points each)	50 points	9.96%
11 CANVAS Prelab Quizzes (10 points each)	110 points	22.91%
10 CANVAS Postlab Quizzes (10 points each) + safety contract electronic signature (1 point) + midterm evaluation (1 point)	102 points	20.32%
3 Lab practical exams (25 points each)	75 points	14.94%
2 Formal Reports (35 points each); 1 lab procedure (10 points)	80 points	15.94%
Laboratory Notebook (20 points)—checked twice during the semester	20 points	3.98%
Total points	502 points	100%

GRADING SCALE: Based on total number of points earned, rounded to the nearest whole point.

A	B	C	D	F
90.0% -- 100%	80.0% -- 89.9%	70.0% -- 79.9%	60.0% -- 69.9%	< 60.0%
433 - 481 points	385 - 432 points	335 - 384 points	288- 334 points	0-287 points

CHM 1045 LABORATORY Schedule

(Tentative schedule, subject to change as needed)

****Any alterations to this syllabus will be posted on CANVAS and announced in class****

Date	Wk	Experiment	DUE	Assignments
January 7 <i>Friday January 9 is last day to drop/add and pay fees.</i>	1	First Class Meeting: Safety lecture, syllabus overview, Lab notebook Prelab for Exp 1		<ul style="list-style-type: none"> Lab notebook Prelab (Exp measurements) CANVAS Prelab (Exp measurements) CANVAS Safety Quiz Safety Contract Signed
January 14	2	Exp Measurements: How are the concepts of significant digits, uncertainty, and measurements related?	<ul style="list-style-type: none"> Lab notebook Prelab (Exp Measurements) CANVAS Prelab (Exp Measurements) CANVAS Safety Quiz Safety Contract Signed 	<ul style="list-style-type: none"> CANVAS Postlab (Exp measurements) Lab notebook Prelab (Exp Nomenclature) CANVAS Prelab (Exp Nomenclature)

Date	Wk	Experiment	DUE	Assignments
January 21	3	Exp Nomenclature: Naming compounds and determining formulas	<ul style="list-style-type: none"> CANVAS Postlab (Exp measurements) Lab notebook Prelab (Exp Nomenclature) CANVAS Prelab (Exp Nomenclature) 	<ul style="list-style-type: none"> CANVAS Postlab (Exp Nomenclature) Lab notebook Prelab (Exp density) CANVAS Prelab (Exp density)
January 28	4	Exp Density: Can the DENSITY of a mixture be used to determine its composition?	<ul style="list-style-type: none"> CANVAS Postlab (Exp Nomenclature) Lab notebook Prelab (Exp density) CANVAS Prelab (Exp density) 	<ul style="list-style-type: none"> CANVAS Postlab (Exp density)
February 4 <i>Friday, February 6 is last day to withdraw for 25% refund.</i>	5	Lab practical Exam #1: Measurements	<ul style="list-style-type: none"> CANVAS Postlab (Exp density) 	<ul style="list-style-type: none"> Lab notebook Prelab (Exp Chromatography) CANVAS Prelab (Exp Chromatography)
February 11	6	Exp Chromatography and Color Separating and Identifying Compounds via Spectroscopy	<ul style="list-style-type: none"> Lab notebook Prelab (Exp Chromatography) CANVAS Prelab (Exp Chromatography) 	<ul style="list-style-type: none"> CANVAS Postlab (Exp Chromatography) Lab notebook Prelab (Exp Color) CANVAS Prelab (Exp Color)
February 18	7	Exp Concentration and Color: Can Solution Color be Used to Determine Concentration? (Beer's Law)	<ul style="list-style-type: none"> CANVAS Postlab (Exp Chromatography) Lab notebook Prelab (Exp Color) CANVAS Prelab (Exp Color) 	<ul style="list-style-type: none"> CANVAS Postlab (Exp Color)
SPRING BREAK 2-7 MARCH	8	Lab Practical Exam #2: Beer's Law	<ul style="list-style-type: none"> CANVAS Postlab (Exp Color) 	<ul style="list-style-type: none"> CANVAS Prelab (Exp Polarity) Lab notebook Prelab (Exp Polarity)
March 11	10	Exp Polarity: "How Does Polarity Affect Solubility?"	<ul style="list-style-type: none"> CANVAS Prelab (Exp Polarity) Lab notebook Prelab (Exp Polarity) 	<ul style="list-style-type: none"> CANVAS Postlab (Exp Polarity) Lab notebook Prelab (Exp Copper) CANVAS Prelab (Exp Copper)

Date	Wk	Experiment	DUE	Assignments
March 18	11	Exp Copper Hydrate: Can the empirical formula of an ionic hydrate be determined experimentally?	<ul style="list-style-type: none"> CANVAS Postlab (Exp Polarity) Lab notebook Prelab (Exp Copper) CANVAS Prelab (Exp copper) 	<ul style="list-style-type: none"> CANVAS Postlab (Exp Copper) Lab notebook Prelab (Exp Titration) CANVAS Prelab (Exp Titration)
March 25 <i>Friday 27 March is last day to withdraw with "W"</i>	12	Exp Titration: What is the Formula Weight of an Unknown Diprotic Acid (H_2A)?	<ul style="list-style-type: none"> CANVAS Postlab (Exp Copper) Lab notebook Prelab (Exp Titration) CANVAS Prelab (Exp Titration) 	<ul style="list-style-type: none"> CANVAS Postlab (Exp Titration) Lab notebook Prelab (Exp Neutralization) CANVAS Prelab (Exp Neutralization)
April 1	13	Exp Neutralization: Is the Heat of Neutralization when H^+ and OH^- Combine to Form Water?	<ul style="list-style-type: none"> CANVAS Postlab (Exp Titration) Lab notebook Prelab (Exp Neutralization) CANVAS Prelab (Exp Neutralization) 	<ul style="list-style-type: none"> CANVAS Postlab (Exp Neutralization) CANVAS Prelab (Exp Missing Label) Create a procedure for Missing label problem Lab notebook Prelab (Exp Missing Label)
April 8	14	Lab Practical Exam #3 "Missing Label Problem"	<ul style="list-style-type: none"> CANVAS Postlab (Exp Neutralization) Create a procedure for Missing label problem Lab notebook Prelab (Exp Missing Label) CANVAS Prelab (Exp Missing Label) 	<ul style="list-style-type: none"> CANVAS Prelab (Exp MW Unknown Gas) Lab notebook Prelab (Exp MW Unknown Gas)
April 15	15	Exp Gas: What is the Molecular Weight of an Unknown Gas?	<ul style="list-style-type: none"> CANVAS Prelab (Exp MW Unknown Gas) Lab notebook Prelab (Exp MW Unknown Gas) 	<ul style="list-style-type: none"> CANVAS Postlab (Exp MW Unknown Gas)
<i>April 22 April 27 is last day of classes</i>	16	Make up Missed labs if necessary**	<ul style="list-style-type: none"> CANVAS Postlab (Exp MW Unknown Gas) 	

***Note: Only **one** experiment may be completed on make-up day. Arrangements to make up a missed experiment must be made with your instructor prior to Week 15. All make-ups are at the instructor's discretion.*

Formal Lab Report Deadlines:

Formal Lab reports are due 7 days after the associated lab in the Turn-it-in dropbox on CANVAS. Each report will be checked for plagiarism.

Formal report topics and deadlines will be announced in class.