CHEMISTRY 150L- STRUCTURE AND PROPERTIES LABORATORY

FALL 2017

CLASS SCHEDULE:	**Section L-A** M – 2:30-5:30 PM
	Section L-C W – 2:30-5:30 PM
INSTRUCTOR:	Dr. Nichole Powell
THE OFFICE:	OSB 420
OFFICE HOURS:	Designated hours:
	Wed: 8:30 – 9:30 am; 5:30 – 6:30 pm
CONTACT INFORMATION:	**Email**: nichole.powell@emory.edu **Telephone**: 770-784-8396

CLASS MATERIALS (REQUIRED):

- Pre-lab reading materials and background information will be made available via CANVAS. You should either print out the Canvas material for that lab or bring a device which can access it.
- Safety glasses (obtained through the department)
- **Carbon-copy notebook (needed for Monday lab section only)**
- **Laptop to be brought to every lab (needed for Wednesday lab section only)**

COURSE OUTCOMES:

At the end of this course you should be able to:

- **Make connections between the macroscale** (what you see, smell, and touch), **the microscale** (atoms, molecules, and ions), **and the representational** (symbols, formula, and equations).
- **Construct a valid and well supported scientific argument using claims, evidence and reasoning.**

Fundamental laboratory skills:

- weigh samples
- use volumetric glassware to measure liquids
- prepare solutions
- perform dilutions
- calculate percent error, percent yield, percent loss
- demonstrate scientific record keeping skills (necessary for research and medical charts)
- recognize dangers and practice appropriate laboratory safety precautions
- safely handle and dispose of chemicals
- display ethical practices in recording evidence

Fundamental laboratory software skills:

- Microsoft Excel - spreadsheets with calculation and graphing functions
    - create tables, graphs, and perform calculations
- Spartan- molecular modeling
- ChemDraw

Experience using laboratory instrumentation:

- analytical balances
- pH meters

- UV/VIS spectroscopy
- XRD

Other exportable skills:
- prioritize time and multi-task to meet the needs of the laboratory time constraints
- display teamwork in group activities using interpersonal skills
- show self-reliance when working independently

Competencies:
*These typically involve the integration of knowledge, skills, and attitudes in complex ways that require multiple elements of learning**.***
- Demonstrate a fundamental understanding of stoichiometry by applying some aspects of stoichiometry in the execution of the experiments and the final project.
- Construct and evaluate a calibration curve.
- Identify the variables in an experiment (independent, dependent, controlled, and uncontrolled variables)
- Identify important factors that affect the execution of an experiment (particularly in experimental design/redesign)
- Identify questionable data (data that does not follow the expected pattern)
    - Repeat/redesign trials that produce questionable data
- Analyze data and perform some fundamental aspects of statistical analysis, including the calculation of averages and standard deviations as well as assessing whether it is statistically valid to reject a data point.
- Select, organize, and effectively present qualitative and quantitative evidence.
- Identify and reflect on potential mistakes/issues/errors during the execution of the experiment

COURSE REQUIREMENTS AND GRADING:

1. Before coming to prelab. You must read your material you need to conduct that week's experiment and complete any pre-lab assignments.

2. Prelab meeting. This will precede each experiment. It will begin promptly at the beginning of the lab period, in the classroom listed on the class schedule. *It is important that you be on time for this.* If you miss the prelab meeting (or a substantial portion of it), you will not be allowed to work in lab that week and will be given a zero for the experiment. You are not allowed to use cell phones in the prelab meeting. Should you bring one and it goes off, or should you use it in any way, you will leave and receive a zero for that experiment.

3. In lab. You must use a carbon-copy lab notebook, available in the bookstore. You will not be allowed to work in the lab without this notebook. During the lab, everything you measure and observe is to be recorded directly in your lab notebook, in ink. Never write things down on scraps of paper. Any changes or corrections must be made by drawing a line through the error and writing the correct item in beside it. Never try to correct an entry by writing over it in heavier strokes. Never use "white-out" to correct an entry. All calculations must be shown – neatly and legibly – in your carbon-copy lab notebook and/or report. If you used an unknown, be sure to record its code in your notebook. **See Canvas for more**

information regarding the format of your lab notebook sheet. Ensure that you turn in your lab notebook sheet before you leave lab.

On some experiments you will work in pairs (or larger groups). The lab manual or your instructor will tell you when to work together. Do NOT work together on experiments unless the lab manual or your lab instructor tells you to; if you do, your assigment grade may be lowered.

Work efficiently and make use of your time. You are expected to remain in the lab until your experiment is finished. You are not allowed to use cell phones in lab. Should you bring one and it goes off, or should you use it in any way, you will leave and receive a zero for that experiment.
At the end of lab each lab, make sure that you put all the equipment that was in the drawer or cupboard back in the drawer or cupboard, as another student will need it in the next lab. Do not leave items lying around the lab or on the drying racks. If you are missing an item of equipment you need for an experiment, get the needed item from where it is kept in the labs (or check the drying racks for items left there). Do not take equipment from another drawer or cupboard. Some equipment will be put out on the bench or a side bench – put these back where you got them, NOT in the drawer or cupboard.

4. Safety. The laboratory can be a safe place if you follow the safety rules. If you violate the safety rules, your lab evaluation may be lowered, and you may not be allowed to work in the lab. Your lab manual lists the laboratory safety rules; the two most important:

- You must wear a pair of safety glasses, even if you normally wear glasses. The chemistry department sells several styles; you may use your own, subject to approval of your lab instructor. The chemistry department does not loan glasses. While in the laboratory, you must wear the safety glasses at all times; even if you have finished with the experiment, others may still be working. You will not be allowed to be in the lab without your safety glasses.

- You must wear closed-toe shoes in the lab. If you come to lab with open-toe shoes, you will have to leave lab and put on proper shoes before returning.

5. Attendance. The laboratory is a scheduled class and should be treated as such. The only acceptable reasons for missing a lab are illness/emergency or a college-related activity (such as a field trip or a trip where you are representing the school). If you miss a lab for any other reason, you will receive a zero. If you do not follow the procedure below, you will receive a zero regardless of the reason:

In the case of an illness or emergency, you must let me know the reason by the date and time of the lab. If the reason is acceptable, you may be allowed to make up the lab another day that week or if that is not possible, that lab will not be counted.

If you know you are going to need to miss lab for a college-related activity, you must talk to me at least a week before the lab. Again, you may be allowed to make up the lab another day that week or if that is not possible, that lab will not be counted.

Only one lab can be missed (even if made up), regardless of the reason. A second missed lab will result in an F in lab and therefore an F in the course, unless prior arrangements are made with me.

Some things are NEVER acceptable excuses for missing a lab, such as leaving early for vacation, a doctor's appointment (unless due to an emergency), meetings, something scheduled for another class, etc.

6. Course Assignments and Grading.

Lab notebooks	55%
Lab reports	15%
Quality checks	20%
Excel/Spartan assignments, pre/post lab quizzes	1% (Bonus)
In-lab Excel evaluation	5%
	101%

*The Excel and Spartan assignments and pre/post lab quizzes are not part of your course grade. You will be given a 1% bonus to your course grade if you have completed all 4 Excel and Spartan online assignments by the deadline and if you earn an 85% or higher on pre-and post-lab quizzes (you may drop the lowest quiz grade)

Laboratory notebooks

The notebook carbon copy pages you turn in for each experiment will be graded on a 100-point basis. See the Canvas documents on Notebooks. Notebook pages turned in late (not at the end of the lab session) will lose 10 points, and 10 additional points for every day late. There are 11 weeks of laboratory sessions. To encourage learning from feedback, the laboratory notebook grades will be worth an increasing percentage of the course grade over time.

- Expts 1, 2, 3, and 4 (parts I and II) are worth 4% each. total 16%
- Expts 5, 6, 7 and 8 are worth 6% each. total 24%
- Expt 4 (parts I and II) are worth 7.5% each. total 15%

Laboratory notebooks 55%

Laboratory reports

To encourage learning from mistakes and feedback, the laboratory report grades will be worth an increasing percentage of the course grade over time. See the Canvas document on lab reports for more information, including due dates. Lab reports are graded on a 100-point basis. Lab reports turned in late will lose 10 points, with 10 additional points for every day late. If you frequently turn in assignments late, the penalty will escalate.

- Lab report 1 4%
- Lab report 2 5%
- Lab report 3 6%

Lab reports 15%

Quality checks

To encourage personal responsibility, your technique will be evaluated for important laboratory skills. There are 3 quality checks.

- Quality check 1 3%
- Quality check 2 7 %
- Quality check 3 10%

Quality checks 20%

In-lab Excel evaluation

You will be given an in-lab Excel assignment in order to evaluate your proficiency in using this spreadsheet program to create tables, graphs, and perform calculations. You will be given a laboratory scenario with a beginning question, a procedure, and raw data from a student notebook. You will make a claim, provide evidence (using Excel to create tables and/or graphs, and perform calculations with experimental data), and reasoning.

Excel proficiency check 5%

Excel and Spartan online modules and assignments

During the semester, you complete several Excel and Spartan software online training modules and assignments through the CANVAS site to help you become proficient.

Pre-lab Quizzes

A 5-minute pre-lab quiz may be given at the beginning of some lab sessions to determine your level of preparation and readiness for lab.

Post-lab Quizzes

A 5-10 minute quiz may be given at the end of some laboratory sessions. These quizzes will cover the concepts behind the experiments or techniques just completed and may include concepts from previous experiments.

(Excel/Spartan assignments, pre/post lab quizzes) 1% (Bonus)

Grading Scale

A = 93 – 100	A- = 90 – 92	B+ = 87 – 89	B = 83 – 86	B- = 80 – 82
C = 73 - 76	C- = 70 - 72	D+ = 67 - 69	D = 60 – 66	F = below 60 F

ACCOMODATIONS:

Students who have a documented disability and believe that they may need accommodation in this course are encouraged to contact the Access and Disability Services Resources (ADSR) (**adsroxford@emory.edu**; 770.784.4690) as soon as possible to ensure that such accommodations are implemented in a timely fashion.

HONOR CODE POLICY:

It is expected that you will adhere to the Honor Code. It is expected that you will not cheat, contribute to or condone the cheating of others. You are therefore expected to submit your own best effort on all assignments. Having a cell phone during a quiz/exam will be treated as a violation of the Honor Code. Unless otherwise specified,
collaboration is not allowed in any assignment to be submitted – including laboratory reports. You may collect data in groups however you may not collaborate with other students when completing lab notebook sheets/lab reports.