CHEM 150L Lab Syllabus

Professor: Dr. Cedric Owens **Email:** cpowens@chapman.edu
Office Hours: Tue, Fri 13:00-14:00 in Keck 245 and by appointment
Office hours can be held remotely by request

Required Materials

All lab material will be provided in the lab class. These materials include the lab manual and lab coat. You will need to use the lab goggles you received in CHEM 140L.

Description:

CHEM 150L is the second semester of a two-semester laboratory sequence. It acts as a supplement to CHEM 150 lecture. The lab and lecture courses are distinctly separate from each other and will cover different material at times. The laboratory emphasizes careful observation, interpretation, and recording of chemical phenomena as well as teaching basic techniques and common chemical manipulation. This course is developed primarily to develop lab techniques and experimental designs.

CHEM 150L Success

There is no such thing as someone who is good or bad at chemistry, but success is earned. CHEM 150L requires an investment of time and effort to be successful and beneficial for any person. Success in this course is not necessarily measured by a grade, per se, but by the knowledge and lab skills gained by the student about experimental design and lab technique. If a student utilizes their time in the lab to the fullest extent and strive to understand the material, they will be successful (based on the definition given above). This will require focus, effort, and dedication, but the benefits will be reaped for your career as a student and in the career(s) that you end up in after leaving Chapman University.

Assignments and Evaluation:

There are several assignments for each lab period. The description of these assignments, along with the point breakdown is provided below. Total of 1000 points.

1. Pre-lab assignments (100 points)
   - Contained within Canvas. Submitted digitally. These must be completed before the start of the lab period. You will not be able to complete the lab procedure if this is not completed.
   - There will be a total of 11 Pre-lab assignments, worth 10 points each, with the lowest score dropped.
2. Experiment Completion and Data Analysis (600 points)
   - Comprised of all the data collected and analyzed during the lab, along with the questions and calculations that are to be completed during the lab period.
   - This must be completed **before** leaving the lab unless noted by the instructor.
   - Both lab partners **must** answer every question/calculation and record all data in their individual lab notebooks. Failure to do so can result in loss of assignment points. You will work with your lab partner on these together.
   - Each Experiment is worth 50 points, with a total of 12 experiments.
3. Lab Technique (30 points)
   - Each student will be observed by their instructor throughout the semester on their general lab technique. (i.e. balance use/cleanliness, data recording, glassware use, lab station cleanliness, reagent use/organization and safety)
4. Lab Practical Mid Semester Skill Check (150 points)
   - Given 2 hours to complete this hands-on, experimental exam during **week 9**.
   - Though you work with a lab partner during the semester, this will be completed individually and each student will be evaluated individually.
   - This will be a mid semester check of your lab technique and skills.

5. Formal Written Lab Report (120 points**)**
   - One written report will be assigned for Week 3 Lab. Each student will write their own individual report. A detailed Written Report Description will be provided.
   - The written report submission will go through a 2 step submission process: 1st submission (due in Week 5) will be anonymously peer-reviewed by 2 other students from Week 5 to 6 and the 2nd submission will be the final draft submitted to the instructor (due in Week 9).
   - The first draft submission and peer review are worth 20 points each. The final draft will be graded out of 80 points.

Late Work

- Late work: any assignment not turned in at the beginning of lab on the day it is due.
- Late work will be accepted – a 10% deduction will be attributed for each day late. Any assignment turned in greater than 1 week late will not be accepted (given a 0).

Attendance:

Attendance at your regularly scheduled lab section is **mandatory.** Labs will begin promptly at start times. If you are late or miss a lab class, this will greatly hinder your ability to be successful in this course since all the work is completed during lab time. The only excusable reasons for missing a lab that could allow admission to a different section as make-up are

1) Required attendance at an **official** University event.
2) Serious illness with proper documentation (i.e. doctor's note) or COVID required quarantine or sickness.

Makeup Lab Work for a Missed Lab Period:

If you miss a lab period due to illness or required attendance at an official University event you must notify your instructor ASAP. If your instructor deems your absence from the lab as acceptable(see above), it is **your** responsibility, not the instructor's, to do the following:

1. Look at the current lab schedule available in your Canvas course site to determine which available lab fits within your schedule.
2. Email the instructor for the lab section you wish to attend to ask permission to attend their lab (be sure to specify the date and time), and cc your instructor.
3. The instructor will email you back to let you know if they can accommodate your request.

In the event that you make up an experiment with another lab section, you must make arrangements to submit your assignments to your lab instructor. It is **not** the make-up lab instructor's responsibility to transfer your assignments.

COVID Quarantine and Lab Make-up

If you miss a whole week of classes and cannot make up the lab during the week you missed, there were be 4 make-up lab sessions on 4 Fridays from 1-5 PM during the semester. These sessions are set aside specifically for students to make up missed labs. These Friday dates are 2/25, 3/11, 4/15, and 5/6.

To be able to attend these make-up times, you will need to fill out this online form (https://bit.ly/150makeup). Then you will wait to get a confirmation email from Dr. Gartner to make up the lab on the designated Friday.

Grade Scale

Grade	Points	%		Grade	Points	%
A	925-100	92.5		C	725-769	72.5
A-	895-924	89.5		C-	695-724	69.5
B+	870-894	87.0		D+	670-694	67.0
B	825-869	82.5		D	625-669	62.5
B-	795-824	79.5		D-	595-624	59.5
C+	770-794	77.0		F	below 595	below 59.5

Responsibilities Prior to coming to Lab Each Week:

1. Read the experiment for the upcoming lab.
2. Complete the assigned Pre-Lab assignment, review the additional reading and watch the lab video provided on Canvas.
3. Review the previous week's experiment material to prepare for the weekly quiz.
4. Come prepared to each lab period ready to be engaged in the material and address a chemical challenge or problem in the lab.

Typical Lab Period Schedule Each Week:

- The first 30 min to hour of lab is dedicated to the pre-lab activities and a short lecture to become familiar with and learn the necessary material or techniques for the lab.
- Once prompted by your instructor, work with your lab partner to complete the lab, including the experimental procedure, Data collection, Data Analysis, Interpretation and Extension questions.
- Students are expected to spend the full four hours of the lab period completing the lab procedure, along with the Data Analysis, Implications and Extension questions (and writing assignment, if applicable).

How to Correctly use a Lab Notebook:

1. Enter data **directly** into lab tables. Never record data on scrap paper to transfer to lab or yell at your lab partner across the room with the values to record.
2. Record data with the correct number of significant figures (yes, they matter!).

Safety Policies:

Students are required to follow all safety rules and standards set forth by Schmid College of Science and Technology. Students not following these standards may be asked to cease activities and/or leave the laboratory. Laboratory instructors have full discretion to assess penalties as they see fit should students violate any of these policies.

Required Clothing

Students are required to wear sturdy close-toed shoes, long pants, and bring hair ties to tie back long hair, when applicable.

Safety Goggles/Lab Coats

Safety goggles must be worn at all times in the laboratory. If you need to remove your goggles during an experiment at any time, you will need to stop your lab work, notify your instructor, and excuse yourself from the room before removing the goggles. Most lab-related eye injuries result from a spill that was generated **not** by the injured person, but by someone else in the nearby vicinity. You will be provided a lab coat at the beginning of the semester for your use during the semester. Safety goggles are provided to you to keep. These goggles are for use for the duration of your career at Chapman. **You will be asked to leave the lab and will receive a grade of zero for the experiment if you repeatedly take of your goggles without approval.**

Food and drink:

All food and drinks (including water) should never be eaten / drunk in the lab. There are serious repercussions to ingesting food that can be contaminated with chemicals present in the lab. Food and drinks can absorb volatile (vapors) chemicals and be contaminated just by being in the lab. Never bring food/drink in the lab. Even in closed containers, drinks should NEVER be at your lab bench. If you need to drink something or take a short break for a snack, step outside the lab and leave the food outside.

Cell Phones

The use of cell phones at any time during the lab will not be permitted. They are a distraction to your ability to complete the experimental procedure and can cause accidents. You can and will be asked to leave the experiment if you repeatedly violate this policy and receive a 0 on the experiment. This policy is for your safety and the safety of others around you in lab.

Emergency:

In case of emergency: Evacuate to the football field

Learning Outcomes

CHEM 150L Specific Learning Outcomes

- Apply the hypothesis driven scientific method to solve problems.
- Demonstrate competency and mastery of basic chemical laboratory skills
- Use analytical skills to design a scientific experiment.
- Understand and apply basic laboratory techniques.
- Natural Science Inquiry Learning Outcome: Uses scientific principles and reasoning as a way of knowing the natural world, distinguishing science from non-science.

Program Learning Outcomes for the B.S. Chemistry.

In addition to the above learning outcomes, CHEM 150L allows for introduction or reinforcement of the following Program Learning Outcomes for the B.S. in Chemistry.

- Students will be able to use the scientific method to solve problems
- Students will be able to demonstrate written, visual, and oral presentation skills to communicate scientific knowledge
- Students will be able to apply critical thinking and analytical skills to design and execute a scientific experiment, thoroughly analyze the results, and arrive at well-reasoned scientific conclusions.
- Students will be able to demonstrate an understanding of core knowledge of chemistry.

Campus Policies

Academic Integrity

Chapman University is a community of scholars that emphasizes the mutual responsibility of all members to seek knowledge honestly and in good faith. Students are responsible for doing their own work and academic dishonesty of any kind will be subject to sanction by the instructor/ administrator and referral to the university Academic Integrity Committee, which may impose additional sanctions including expulsion. Please see the full description of Chapman University's policy on Academic Integrity at: www.chapman.edu/academics/academicintegrity/index.aspx

Equity and Diversity

Chapman University is committed to ensuring equality and valuing diversity. Students and professors are reminded to show respect at all times as outlined in Chapman's Harassment and Discrimination Policy. Please see the full description of this policy at http://www.chapman.edu/faculty-staff/human-resources/eoo.aspx.
Any violations of this policy should be discussed with the professor, the dean of students and/or otherwise reported in accordance with this policy.

Student Support at Chapman University.

Over the course of the semester, you may experience a range of challenges that interfere with your learning, such as problems with friends, family, and or significant other relationships; substance use; concerns about personal adequacy; feeling overwhelmed; or feeling sad or anxious without knowing why. These mental health concerns or stressful events may diminish your academic performance and/or reduce your ability to participate in daily activities. You can learn more about the resources

available through Chapman University's Student Psychological Counseling Services here:
https://www.chapman.edu/students/health-and-safety/psychological-counseling/

Students with Disabilities Policy

In compliance with ADA guidelines, students who have any condition, either permanent or temporary, that might affect their ability to perform in this class are encouraged to contact the Disability Services Office. If you will need to utilize your approved accommodations in this class, please follow the proper notification procedure for informing your professor(s). This notification process must occur more than a week before any accommodation can be utilized. Please contact Disability Services at (714) 516–4520 or visit the following link:
www.chapman.edu/students/student-health-services/disability-services

If you have questions regarding this procedure or for information or to make an appointment to discuss and/or request potential accommodations based on documentation of your disability. Once formal approval of your need for an accommodation has been granted, you are encouraged to talk with your professor(s) about your accommodation options. The granting of any accommodation will not be retroactive and cannot jeopardize the academic standards or integrity of the course.

Safety Protocols for On Campus Instruction

In response to the current COVID-19 pandemic, Chapman University has developed the CU Safely Back program (CUSBP) and mandatory safety measures (https://news.chapman.edu/coronavirus/). The University's mandatory safety measures may be stricter than local, state or federal guidelines and may be subject to change at any time. Students are expected to adhere to the University's safety measures while attending classes, including when entering and exiting classrooms, laboratories, or other instructional areas. Individual faculty may choose to have requirements for their courses that are stricter than the University's*. Safety precautions and procedures may change in response to emerging findings and the recommendations of scientific experts and authorities. Refusal to abide by the University's mandatory safety measures or to the safety requirements specific to this course will result in your being asked to leave the area immediately, and may result in an administrative dismissal from this course. The COVID-19 pandemic requires all of us to accept the possibility that changes in how this course is taught may be required and that some changes may occur with little or no notice. For example, some or all of the in-person aspects of a course may be shifted to remote instruction. If this occurs, you will be given clear instructions as to how to proceed. The uncertainty of the situation is not ideal for any of us. We must all try to approach this situation with good-will, flexibility, and mutual understanding.

CHEM 150L Experiment Schedule

Week Start Date	Lab	Experiment Description
1/31	Week 1	Remote - Laboratory Safety and Group work, CHEM 140L Review
2/7	Week 2	Investigation of Specific Heat
2/14	Week 3	Heat of Reaction
2/21	Week 4	Solution Preparation and Analysis
2/28	Week 5	Aspirin Tablet Analysis
3/7	Week 6	Which is the Best Radiator Fluid Replacement?
3/14	Week 7	Lab Practical
3/21		**Spring Break**
3/28	Week 9	Vapor Pressure of Liquids Analysis using the Clausius-Clapeyron Equation
4/4	Week 10	Molecular Mass Determination of an unknown using Freezing Point Depression
4/11	Week 11-12	Kinetics of Crystal Violet *Part 1: Method of Initial Rates*
4/18	Week 11-12	Kinetics of Crystal Violet *Part 2: Integrated Rates*
4/25	Week 13	Le Chatelier's Principle
5/2	Week 14	The Thermodynamics of a Transition Metal Complex Reaction
5/9	Week 15	Designing a Buffer Solution