

# Quantitative Analysis Laboratory Section 03

## CHEM 55L

Spring 2023 2 Unit(s) 01/25/2023 to 05/15/2023 Modified 01/12/2023

### Contact Information

Email:	Richard.freeman@sjsu.edu - best contact method
Office Hours:	Monday - Wednesday - 12:30 - 2:00 PM
Class Days/Time:	Section 3 – Monday, Wednesday - 2:30 AM– 5:20 PM Section 2 – Tuesday, Thursday - 10:30 PM – 1:20 PM
Classroom:	Duncan Hall 413
Prerequisites:	You must have either previously passed or be currently registered for Chem 55 to take this course.

Masks will be required when indoors at SJSU.

Students registered for a College of Science (CoS) class with an in-person component should view the [CoS COVID-19 and Monkeypox Training \(https://drive.google.com/drive/folders/1Vmp39U9-CNpbwRobtZsGIZPTgRwV\\_Nh6\)](https://drive.google.com/drive/folders/1Vmp39U9-CNpbwRobtZsGIZPTgRwV_Nh6) slides for updated CoS, SJSU, county, state and federal information and guidelines, and more information can be found on the [SJSU Health Advisories \(https://www.sjsu.edu/healthadvisories/\)](https://www.sjsu.edu/healthadvisories/) website. By working together to follow these safety practices, we can keep our college safer. Failure to follow safety practice(s) outlined in the training, the SJSU Health Advisories website, or instructions from instructors, TAs or CoS Safety Staff may result in dismissal from CoS buildings, facilities or field sites. Updates will be implemented as changes occur (and posted to the same links).

**This class meets twice a week, either Monday and Wednesday or Tuesday and Thursday. The first meeting of this class will either be Wednesday January 25 (Section 3) or Thursday January 26 (Section 2).**

**During the first class I will give a presentation on safety in the laboratory, discuss how the course will be run and you will check into your lab locker. If you are not present for the first class I will give your seat to the first person on the waiting list.**

With the exception of the first class, students will be required to wear a lab coat and lab goggles, as well as generally protective clothing, to prevent possible injury. This is in addition to a facemask to prevent the spread of COVID-19.

## Course Description and Requisites

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Introduction to chemical analysis techniques.

Pre/Co-requisite: CHEM 055

Misc/Lab: Lab 6 hours.

Letter Graded

## \* Classroom Protocols

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### Classroom Protocol

Penalties are imposed if an analysis must be repeated because of poor reported results or if results are reported after the announced deadlines. Adequate time is allotted to complete the assignments and to repeat some determinations. Because of COVID it is unlikely that students can make up missed work in another section. If the situation changes we can be more flexible. HOWEVER, A STUDENT SHOULD NEVER WORK ALONE, AND AN INSTRUCTOR SHOULD BE WITHIN SHOUTING DISTANCE. CELL PHONE CONVERSATIONS ARE NOT PERMITTED IN THE LAB. PLEASE EXIT TO THE HALLWAY IF YOU MUST MAKE OR RECEIVE A CALL.

### University Policies

Per [University Policy S16-9](http://www.sjsu.edu/senate/docs/S16-9.pdf) (<http://www.sjsu.edu/senate/docs/S16-9.pdf>), relevant information to all courses, such as academic integrity, accommodations, dropping and adding, consent for recording of class, etc. is available on Office of Graduate and Undergraduate Programs' [Syllabus Information web page](http://www.sjsu.edu/gup/syllabusinfo/) at <http://www.sjsu.edu/gup/syllabusinfo/>. Make sure to visit this page, review and be familiar with these university policies and resources.

The following schedule is the best estimate of the instructor. It may be adjusted if the instructor feels the need to make changes.

## Course Goals

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### Course Goals

Upon successful completion of this course, students will be able to:

PLO 1.1 - identify, formulate, and solve a range of chemistry problems (fundamental to complex) through application of mathematical, scientific, and chemical principles.

PLO 2.1. - develop an experiment to address a hypothesis using literature and execute the planned experiment using standard chemistry techniques.

PLO 2.2 - acquire, record, and critically evaluate data through use of instrumentation and software, appropriate record keeping practices, figure preparation, and scrutiny of experimental results.

PLO 2.3 - recognize and assess laboratory hazards, practice risk minimization, and conduct safe laboratory practices.

#### Course Learning Outcomes for Chemistry 55L

Upon successful completion of this course, students will be able to:

- CLO#1 – Perform accurate and precise analyses in the field of Analytical Chemistry

- CLO#2 – Keep records of all performed analyses in a manner which is required in a modern analytical laboratory.
- CLO#3 – Carry out statistical analysis and evaluate repeatability of obtained results.
- CLO#4 – Perform quantitative and qualitative analysis of known standards as well as unknown samples.
- CLO#5 – Identify, properly use, and care for equipment and supplies used in analytical laboratories.
- CLO#6 – Identify the requirements for the adequate protection of personnel from solvents and materials used in an analysis

## Course Materials

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### Required Textbook

Quantitative Chemical Analysis; D.C.Harris, same edition as Chem 55 lecture.

### Other Readings

Lab Manual: Chem 55L Quantitative Analysis Laboratory Manual: will be available online as part of LabArchives.

### Other technology requirements / equipment / material

Lab Notebook: A laboratory notebook is required for all students. We will use an electronic lab notebook. Notebook pages will be due (by upload to the lab notebook web site) at the conclusion of each day of lab. Each page has to be electronically dated and signed. I strongly suggest that you bring either a laptop computer or tablet to lab in order to record your notes directly. If you cannot do this you are required to purchase a traditional lab notebook with carbon-copy pages ([https://www.amazon.com/NATIONAL-Laboratory-Notebook-Brown-43649/dp/B000084QUG/ref=asc\\_df\\_B000084QUG/?tag=hyprod-20&linkCode=df0&hvadid=198081854790&hvpos=&hvnetw=g&hvrnd=12978273383608229018&hvpone=&hvptwo=&hvqmt=&hvdev=c&hvdvcmdl=&hvlocint=&hvlocphy=9031921&hvtargid=pla-320573942356&psc=1](https://www.amazon.com/NATIONAL-Laboratory-Notebook-Brown-43649/dp/B000084QUG/ref=asc_df_B000084QUG/?tag=hyprod-20&linkCode=df0&hvadid=198081854790&hvpos=&hvnetw=g&hvrnd=12978273383608229018&hvpone=&hvptwo=&hvqmt=&hvdev=c&hvdvcmdl=&hvlocint=&hvlocphy=9031921&hvtargid=pla-320573942356&psc=1) ([https://www.amazon.com/NATIONAL-Laboratory-Notebook-Brown-43649/dp/B000084QUG/ref=asc\\_df\\_B000084QUG/?tag=hyprod-20&linkCode=df0&hvadid=198081854790&hvpos=&hvnetw=g&hvrnd=12978273383608229018&hvpone=&hvptwo=&hvqmt=&hvdev=c&hvdvcmdl=&hvlocint=&hvlocphy=9031921&hvtargid=pla-320573942356&psc=1](https://www.amazon.com/NATIONAL-Laboratory-Notebook-Brown-43649/dp/B000084QUG/ref=asc_df_B000084QUG/?tag=hyprod-20&linkCode=df0&hvadid=198081854790&hvpos=&hvnetw=g&hvrnd=12978273383608229018&hvpone=&hvptwo=&hvqmt=&hvdev=c&hvdvcmdl=&hvlocint=&hvlocphy=9031921&hvtargid=pla-320573942356&psc=1))). The copies must be handed in when you leave the lab.

### Lab Archives

You will be given an assignment through Canvas which will take you to the LabArchives website. Your LabArchives subscription will provide you with an electronic notebook which also contains the Lab Manual. When you sign up for LabArchives use your @sjsu.edu email address. This will prevent you from accidentally signing up more than once.

All lab notebook entries must be completed on each day that you are in lab. I will deduct points for late entries.

## Course Requirements and Assignments

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### Course Format

Course materials such as syllabus, handouts, notes, assignment instructions, etc. can be found on Canvas Learning Management System course login website at <http://sjsu.instructure.com>. You are responsible for regularly checking with the messaging system through the [Spartan App Portal](http://one.sjsu.edu) <http://one.sjsu.edu> (or other communication system as indicated by the instructor) to learn of any updates.

Each student **must** have access to a computer and fast internet. The lab notebook will be online as will the lab manual. **A lab coat will be required for this course.** They can be found in the student bookstore and on Amazon.com. Information about purchasing an electronic lab notebook and manual will be given during the first class.

It is **extremely** important that each student arrive in the lab prepared to do the work for the day. You should:

- Carefully read the experiment before coming to class
- Complete and submit any pre-lab assignments
- Understand why each step of the experiment is being done
- Understand which measurements are critical for the final determination of your sample

## ✓ Grading Information

### Chem 55 L Grading Information

- A 10-point penalty will be assigned for turning in reports after the due date.
- A 10-point penalty will be assigned for calculations that are wrong or report that is not in the correct format.
- It is possible to repeat a failed experiment; however, a new sample must be obtained from the instructor. A 10-point penalty will be assigned if the experiment has to be repeated.
- Each experiment will be graded for accuracy (difference between the value provided by manufacturer and value determined by student) and precision (determined by standard deviation of results).
- The Lab Notebook will be graded three times during the semester: These evaluations will be worth 30, 40, and 50 points/as follows. Please read the instructions in Lab Archives on how to keep a lab notebook and how to write a lab report.

#### Points per Assignment - Planned

A0. Calibration	40
A1. Gravimetric	100
A2. Hard Water	100
A3. Mn UV	60
A4. Mn Atomic	60
B1. Phosphate	110
B2. Capsaicin	60
Lab Notebook Evaluation 1	20
Lab Notebook Evaluation 2	30
Lab Notebook Evaluation 3	40
Quiz 1	70
Quiz 2	70
Quiz3 (final)	70
Prelabs/Excel Assignments/Etc.	170
Total	1000

## Example of the grading scale for the Hardness experiment

Key for Hardness		Key for Ca only	
Difference	Points	Difference %w/v	points
10 ppm	99	0.001	99
20 ppm	97	0.002	97
30 ppm	95	0.003	95
40 ppm	90	0.004	90
50 ppm	88	0.005	88
60 ppm	82	0.006	82

Course Grading Scale*,**:	
A+	97%-100%
A	93% - 96.99%
A-	90% - 92.99%
B+	87%-89.99%
B	83% - 86.99%
B-	80% - 82.99%
C+	77%-79.99%
C	73% - 76.99%
C_	70% - 72.99%

\*Safety Quiz point are not included in the final grade.

\*\* Based on the mean of the class performance the scale may be adjusted.

## University Policies

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Per [University Policy S16-9 \(http://www.sjsu.edu/senate/docs/S16-9.pdf\)](http://www.sjsu.edu/senate/docs/S16-9.pdf), relevant university policy concerning all courses, such as student responsibilities, academic integrity, accommodations, dropping and adding, consent for recording of class, etc. and available student services (e.g. learning assistance, counseling, and other resources) are listed on [Syllabus Information web page \(https://www.sjsu.edu/curriculum/courses/syllabus-info.php\)](https://www.sjsu.edu/curriculum/courses/syllabus-info.php) (<https://www.sjsu.edu/curriculum/courses/syllabus-info.php>). Make sure to visit this page to review and be aware of these university policies and resources.

## Course Schedule

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The schedule of work for the semester may be found [here \(https://sjsu.instructure.com/courses/1560355/pages/schedule-of-experiments\)](https://sjsu.instructure.com/courses/1560355/pages/schedule-of-experiments)