

Instructors:

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Learning Goals:

1. Reinforce fundamental chemical concepts through laboratory experiments
2. Develop and emphasize safe laboratory practices
3. Develop qualitative and quantitative laboratory skills, including laboratory techniques (e.g. use of volumetric glassware, balances).
4. Stress thorough and organized documentation on lab report sheets
5. Practice the proper treatment of experimental data, including the correct representation of precision and accuracy and the proper graphical analysis of experimental data.
6. To learn scientific inquiry through hypothesis driven experimentation, data collection, analysis, and interpretation of data.

Materials:

Lab Handouts and Report Sheets:

Lab Handout: This gives the background for the experiment and describes the experimental procedure. You are expected to carefully study the procedure for each experiment prior to the start of lab. Prelab quizzes or assignments will be administered throughout the semester to emphasize the importance of careful pre-lab preparation.

Report Sheets: This document is where you record data, show calculations from your data, and answer analysis questions. You will submit these for all experiments.

The lab handouts and report sheets will be provided as printed copies the week before the experiment and will also be available on Google Drive. The Introduction to Spectroscopy and Lewis Structure labs have the handout and report sheets combined into a single document.

Safety Glasses, Lab Coat, and Gloves: These are provided and must be worn when directed. You are responsible for bringing your lab coat every week that it is required.

Technology Requirements:

Your instructor may elect to provide the pre-lab lecture and/or quiz online. In that case, you must have a computer and internet connection suitable for using Moodle and streaming videos (e.g. from YouTube). In the case you instructor requires it, you may need to photograph or scan handwritten work and to convert to a single PDF since many of the assignments will be submitted electronically. Your instructor will discuss their technology expectations during the first week of classes.

Social Distancing:

While in lab, students must social distance according to current CDC guidelines (3ft based on current guidelines as of 8/26/2021). Students should remain at their station as much as possible. Please be patient when waiting to access common equipment, such as balances and fume hoods. Masks are required while working in lab, just as they are required in all indoor spaces at SMC.

Contingency Plans – Moving Online:

We all must be prepared for disruptions due to COVID, sickness, power outages, smoke, or other causes. If the college announces that in-person classes must move online, or in-person class is cancelled due to smoke or other facility issues, lab may move to an online format.

In this scenario:

- You'll need a computer with webcam and internet connection suitable for Zoom meetings. You will also need some way to photograph or scan handwritten work and to convert to a single PDF (such as the Scanner Pro app).

Please inform your instructor if any of these requirements are difficult, and we will work with you to help you succeed.

COVID academic support and resources: <https://www.stmarys-ca.edu/covid-19-news-resources/academics-classrooms/academic-support-resources>

Contingency Plans – Sickness, Quarantine, and Power Outages:

If you become sick, or are showing symptoms consistent with COVID-19, you must stay home and contact the SMC Health and Wellness center via email (healthcenter@stmarys-ca.edu), even if you are living off-campus. The Health and Wellness Center can provide you with a COVID test and other resources.

<https://www.stmarys-ca.edu/covid-19-news-resources/health-wellness>

Alternately, you may be quarantined due to exposure to another student with COVID-19, or your life and ability to complete schoolwork may be disrupted for a myriad of other reasons. In any case, **please contact your instructor as soon as possible**, and they will work with you to help you continue the course. If you are feeling well enough to continue the course, we will (A) deliver you a take-home laboratory kit and you can continue the lab remotely. If circumstances do not allow you to perform the lab remotely you will need to (B) make up the labs independently later in the semester, or (C) make them up using an online version of the lab. Your lab instructor will help arrange for the appropriate contingency.

STEM Center:

Saint Mary's has a STEM Center for students studying **S**cience, **T**echnology, **E**ngineering, and **M**athematics. The STEM center offers free, virtual, drop-in tutoring on Mon-Thur 1-9 pm and Sun 6-9 pm. See the website for more information: <https://www.stmarys-ca.edu/school-of-science/stem-center>

SCHEDULE: FALL 2020
CHEM 9

| Week of | Expt. # | Experiment | Assignment (points) |
|---------------|---------|---|---|
| 8/30 | | Check-in, Lab Orientation & Safety Discussion | |
| 9/6 | 1 | Introduction to Scientific Measurement & Data Treatment | SPQ (10) + RS (30) |
| 9/13 | 2 | Determination of The Amount of Sugar in Soda | SPQ (10) + RS (30) |
| 9/20 | 3 | Introduction to Spectroscopy and Quantum Theory | RS (30) |
| 9/27 10/4 | 4 | Spectroscopic Analysis: Investigating Kool-Aid Week 1: Part 1 Week 2: Part 2 (Spreadsheet Analysis) | Week 1: SPQ (10) Week 2: RS (30) + SS/GR (10) |
| 10/11 | 5 | Lewis Structures, VSEPR Theory, Valence Bond Theory | RS (30) |
| 10/25 | 6 | Synthesis of Alum | SPQ (10) + RS (30) Post Lab Quiz (50) |
| 11/1 | 7 | Gravimetric Analysis of Barium | SPQ (10) + RS (30) |
| 11/8 11/15 | 8 | Water Analysis Part A-B Water Analysis Part C-D | Week 1: SPQ (10) Week 2: RS (30) |
| 11/22 | | Thanksgiving Week: NO LABS! | |
| 11/29 | 9 | Heat Transfer | SPQ (10) + RS (30) |
| 12/6 | | Finals Week: NO LABS! | |

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| Grading: Safety and Procedure Quizzes (SPQ) 70 pts SS/GR 10 pts Report Pages (RS) 270 pts Post-lab Quizzes 50 pts Total 400 pts | Approximate grading scale: 100 - 80% A 80 - 65% B 65 - 50% C 50 - 35% D Below 35% F |
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Course Assignments:

SPQ
Safety & procedure quiz You will complete a safety and procedure quiz online before coming to lab. The goal with this quiz is to encourage careful prelab preparation, and to ensure that you understand the procedure and safety concerns for each lab.

The SPQ is in addition to the “Prelab” section on your report sheets; you must complete both before the start of lab.

RS
Report Sheets *All data, observations and calculations for experiments will be written directly into the laboratory report sheets using non-erasable ballpoint ink. Report sheets should be clear, thorough, and organized. Your instructor will set a due date for the report sheets each week, and you will submit your report sheets electronically through the method specified by your instructor.*

Post-lab Quiz A post-lab quiz will be used to assess your understanding of the laboratory experiments and concepts. Questions may include conceptual ideas, calculations, or procedural steps. You will only be permitted to use your lab handouts and report sheets during these quizzes. This quiz may be in person or may be conducted online; your instructor will provide further information.

Students Disability Services (SDS):

The College strives to make all learning experiences as accessible as possible. Students who anticipate or experience academic barriers based on a disability are encouraged to contact Student Disability Services (SDS) to set up a confidential appointment to discuss available services and options. The Student Disability Services office can be reached by emailing sds@stmarys-ca.edu; calling [925-631-4358](tel:925-631-4358); or visiting the office located in Filipi Academic Hall FAH190. In addition, students may be eligible for accommodations to periodically take a break from having their camera on, or to be excused from requirements to have their camera on for most of the class. These accommodations must be requested through the SDS office; please contact Devin Toma at dkt1@stmarys-ca.edu for more information.

Course Rules and Regulations:

Attendance Students are required to attend all laboratory sessions and to be on time for their specified section. If students miss a lab, they must notify their instructor as soon as possible, who will work with the student depending on the cause of the absence. Please see the policies on the first page of this syllabus. If students are late, they will miss important announcements and may be unable to finish the experiment, which may lead to reduced grades on assignments. **If a student has more than three or more unexcused absences, they will automatically receive a grade of F.**

Safety Students must follow the safety rules and will sign a safety contract in order to work in the lab. Students must pay attention to the safety guidelines mentioned in their individual lab handouts.

Protective eyewear, appropriate leg coverings (long pants or skirts – no shorts above the knee), and appropriate footwear (closed-top shoes or boots) are mandatory at all times. Lab coats are required for many of the labs. No food or beverages (including water) will be permitted in the laboratory at any time. Depending on the offense, failure to follow the safety policies of the department and laboratory instructor will lead to deduction of points from your lab grade, and may also lead to expulsion from the laboratory.

Cleanliness Students are responsible for maintaining a clean and safe lab environment. Balances must be kept clean at all times, so spills must be cleaned up immediately. Lab benches and must be cleaned and sanitized at the end of each lab session. Shared glassware and equipment must be cleaned and properly stored before the end of each lab session. Failure to keep the lab space clean will result in deduction of points from your lab grade, at the discretion of the instructor.

Academic Honesty It is particularly important when recording data and reporting results that scientists accurately and unambiguously indicate the sources of their data, experimental procedures, and literature values. Therefore, students should carefully reference these sources, which may take the form of lab handouts, the lecture textbook, SMC faculty members, or other students.

Students are expected to work *independently* on all graded assignments, even when the experimental work pertaining to these assignments was performed by groups of students working together. All instances of plagiarism or academic misconduct will be prosecuted according to the SMC Academic Honor Code.

Academic Honor Code

As an academic institution built on trust, Saint Mary's College is committed to fostering the development of scholars who practice integrity in all their academic endeavors. Each student at Saint Mary's pledges

- *to do their own work at all times, without giving or receiving inappropriate aid;*
- *to avoid behaviors that unfairly impede the academic progress of other members of the community; and*
- *to take reasonable and responsible action in order to uphold the community's academic integrity.*

Students affirm this commitment when they accept admission to the College, taking upon themselves the responsibility of abiding by all aspects of the Academic Honor Code. It is

each student's responsibility to review the [Academic Honor Code](#) and to be familiar with its relevant policies and procedures. As a practical matter, the Honor Code requires that any work that a student submits for a grade must be their own, unless specifically indicated otherwise by the instructor. If a student is unclear about the expectations of the Code and how it relates to any particular academic assignment, it is the student's responsibility to seek clarification from the professor. All suspected violations of the Code are referred to the Academic Honor Council for further review and, if necessary, sanctions.

Late Work

If you inform the instructor that the work is late due to COVID-related sickness or hardship, there will be no penalty for late work as long as it is submitted within two weeks after you return to conducting labs. Beyond those two weeks, the penalty for late work is 10% per day, with weekends counting as two days. If you submit work late and do not provide the instructor with an acceptable reason, the penalty for late work is 10% per day starting when the work was originally due.

In any case, please contact your instructor if something is happening that is preventing you from succeeding in the course. We want to help you succeed!

Withdrawal

The lab course *must* be taken concurrently with the lecture course. **If a student withdraws from Chem 8, he/she must also separately withdraw from Chem 9.**