IMPERIAL VALLEY COLLEGE

Basic Course Information

Semester:	**Spring 2025**	Instructor Name:	**Dr. Omar Alshykhly**
Course Title & #:	**Chem 085- Fundamentals of Instrumentation and Analysis**	Email:	**Omar.alshykhly@imperial.edu**
CRN #:	**21183**	Webpage (optional):	
Classroom:	**2715**	Office #:	**2773**
Class Dates:	**02/10/25 – 06/06/2025**	Office Hours:	**MW: 7:30 – 8:00 am** **TR: 4:30 – 6:00 pm**
Class Days:	**TR**	Office Phone #:	**(760) 355-6298**
Class Times:	06:00 pm – 09:10 pm	Emergency Contact:	**Department Secretary** **(760) 355-6155**
Units:	4	Class Format/Modality:	Face to Face

Course Description

This course will be concerned with the practice of instrumental methods for the separation, identification and quantitative analysis of chemical substances. Satisfactory completion of this course will afford students a working knowledge of analytical instrumentation typically employed in chemical laboratories. It will also provide the student with an appreciation of the relative strengths and limitations of different instrumental based analysis methods. (Nontransferable, AA/AS degree only)

Course Prerequisite(s) and/or Corequisite(s)

None

Student Learning Outcomes

Course Objectives

Upon satisfactory completion of the course, students will be able to:

1. Learn and gain an understanding of the overall process for analyzing chemical systems.
2. Learn the proper maintenance and use of glassware in an analytical lab.
3. Gain skills and knowledge needed to successfully collect and evaluate data.
4. Understand the principles and techniques of volumetric, gravimetric and instrumental analysis.
5. Measure and identify unknown compounds using spectrometric, electrochemical and chromatography methods.
6. Relate the strengths and limitations of analytical methods and instrumentation including errors in chemical and instrumental analysis and account for errors in data analysis.
7. Demonstrate the basic principles for qualitative and quantitative analysis.
8. Quantify a variety of substances using classical and modern instrumental analytical methods.
9. Write a scientific lab report using a lab notebook as well as use a laboratory information management system.

10. Learn how a science lab functions; how to coordinate sample analysis, work in a team, keep track of and report results.

Textbooks & Other Resources or Links

1. OER textbook: You don't need to buy a book, we will use a free online textbook. Click on the link to access it:

https://chem.libretexts.org/Bookshelves/Analytical_Chemistry/Analytical_Chemistry_2.1_(Harvey)

2. Lab Manuals will be provided by instructor

3. Non programmable calculator: a highly recommended calculator is the Texas Instruments TI36X Solar Scientific Calculator (not the "Pro") or the TI-30Xa.

Course Requirements and Instructional Methods

Our lecture, and labs will be face to face (both will be on campus). For all classes, we will use canvas for doing the online assignments Homework or quizzes. The midterm exams and final exam will be in-person.

- **Homework and quizzes**: Online Homework for each module will be using canvas, and the due date will be find either on canvas. More information about this will be delivered on the first day of the class. The goal is to give you enough practice to enable you to be successful on the examinations. After the due date, the homework assignment can be worked and submitted late for a 30% deduction. *There's online tutoring with a live person in **Net Tutor** (embedded inside Blackboard or Canvas).

• **Lecture Exams**: we will have 3 midterm exams face to face (in-person) on class. **No make-up exam.**

• **Laboratory**: you will do all experiments on the lab, and you will follow the lab's procedure to do these experiments. **No make-up lab.**

• **Final Exam**: The Final Exam is comprehensive and in-person (You will be tested in all chapters). There are **no make-ups** because the date and time of the Final is the last day of class.

• **Extra credit**: Depending on the whole class performance, I will decide if you all need extra credit or not, and don't expect too many extra credit, just few extra credit will be added on the final grades.

Out of Class Assignments: The Department of Education policy states that one (1) credit hour is the amount of student work that reasonably approximates not less than one hour of class time and two (2) hours of out-of-class time per week over the span of a semester. WASC has adopted a similar requirement.

Course Grading Based on Course Objectives

- **Study Hints:** Chemistry is a very demanding course. Depending on your background, you will need to spend 1-4 hours outside of lab to get your work done. Missing a lecture usually means your grade falls by ½ grade.

- **Do not fall behind so:**
  - **Go to office hours**
  - **Get a tutor**
  - **Form study groups**
- **No Gifts, cards, or food. All will be refused. Spend your time and effort studying.**
- **Don't try to cram! It doesn't work.**
- **Keep up!!**

Homework, quizzes and practice	15%
Lab tech. practice	20%
Lab final exam	10%
3 Midterm exams	20%
Lab Report	25%
Lecture final exam	10%
Total	100%

Your final grade will be assigned based on following manner:

90% – 100%	A
80% - 89%	B
70% - 79%	C
60% - 69%	D
Below 59%	F

Academic Honesty (Artificial Intelligence -AI)

IVC values critical thinking and communication skills and considers academic integrity essential to learning. Using AI tools as a replacement for your own thinking, writing, or quantitative reasoning goes against both our mission and academic honesty policy and will be considered academic dishonesty, or plagiarism unless you have been instructed to do so by your instructor. In case of any uncertainty regarding the ethical use of AI tools, students are encouraged to reach out to their instructors for clarification.

Accessibility Statement

Imperial Valley College is committed to providing an accessible learning experience for all students, regardless of course modality. Every effort has been made to ensure that this course complies with all state and federal accessibility regulations, including Section 508 of the Rehabilitation Act, the Americans with Disabilities Act (ADA), and Title 5 of the California Code of Regulations. However, if you encounter any content that is not accessible, please contact your instructor or the area dean for assistance. If you have specific accommodations through ***DSPS***, contact them for additional assistance.

We are here to support you and ensure that you have equal access to all course materials.

Course Policies

- A student who fails to attend the first meeting of a face to face or hybrid class or does not complete the first mandatory activity of an online class will be dropped by the instructor. Should readmission be desired, the student's status will be the

same as that of any other student who desires to add a class. It is the student's responsibility to drop or officially withdraw from the class. See General Catalog for details.

- Regular attendance in all classes is expected of all students. A student whose continuous, unexcused absences exceed the number of hours the class is scheduled to meet per week may be dropped. For online courses, students who fail to complete required activities for two consecutive weeks may be considered to have excessive absences and may be dropped.

Other Course Information

- **Add/Drop**: it is the responsibility of the student to take the necessary steps to add and/or drop the class by the college deadlines.
- **Late Submissions** Any late work (homework assignment, project, lab report, quizzes, exams) will not be accepted after the due date. If you have an urgent issue or an emergency talk with me in advance to extend the due date for you.

Financial Aid

Your Grades Matter! In order to continue to receive financial aid, you must meet the Satisfactory Academic Progress (SAP) requirement. Makings SAP means that you are maintaining a 2.0 GPA, you have successfully completed 67% of your coursework, and you will graduate on time. If you do not maintain SAP, you may lose your financial aid. If you have questions, please contact financial aid at finaid@imperial.edu.

IVC Student Resources

IVC wants you to be successful in all aspects of your education. For help, resources, services, and an explanation of policies, visit http://www.imperial.edu/studentresources or click the heart icon in Canvas.

Anticipated Class Schedule/Calendar

Week	Lecture Tuesday	Lab experiment Thursday	Homework, and quizzes practice assignments
1 02/10 - 02/16	Syllabus, Introduction to Lab, Lab Safety, Check in	Errors in Measurement lecture	Homework, and quizzes practice assignments on canvas. Check the due date on Canvas
2 02/17 - 02/23	Accuracy, Precision & Tolerance	Measurement experiment	
3 02/24 - 03/02	Instrumental Calibration	Calibration of a Burette Experiment	Homework, and quizzes practice assignments on canvas. Check the due date on Canvas
4 03/03 - 03/09	Stoichiometry, aqueous solutions, & dilutions part 1	**Exam 1**	

5 03/10 - 03/16	Stoichiometry, aqueous solutions, & dilutions part 2	Stoichiometry, aqueous solutions, & dilutions part 3	Homework, and quizzes practice assignments on canvas. Check the due date on Canvas
6 03/17 - 03/23	Equilibrium	Limiting reactant experiment	
7 03/24 - 03/30	Acid, base & equilibrium	Titration part 1 & 2	Homework, and quizzes practice assignments on canvas. Check the due date on Canvas
8 03/31 - 04/06	Exam 2	Vit. C experiment	
9 04/07 - 04/13	Gravimetric analysis part	**Soda Ash experiment or Mn determination experiment**	Homework, and quizzes practice assignments on canvas. Check the due date on Canvas
10 04/14 - 04/20	Gravimetric Sulfate Determination day 1experiment	**Gravimetric Sulfate Determination day 2 experiment**	
04/20 - 04/26	Spring Break	**Spring Break**	**Spring Break**
11 04/28 - 05/04	Beer-Lambert Law Spectroscopy	Chromatography	Homework, and quizzes practice assignments on canvas. Check the due date on Canvas
12 05/05 - 05/11	GCMS	Exam 3	
13 05/12 - 05/18	Training on GCMS	GCMS experiment (TBD)	Homework, and quizzes practice assignments on canvas. Check the due date on Canvas
14 05/19 - 05/25	ICP	**ICP training**	
15 05/26 - 06/01	ICP experiment (TBD)	ICP experiment (TBD)	Homework, and quizzes practice assignments on

			canvas. Check the due date on Canvas
16 **05/05 - 05/11**	Lab Final exam	Lecture Final exam	

*****Subject to change without prior notice*****