



**Chaminade**  
**University**  
OF HONOLULU

#### **Course Syllabus**

Chaminade University Honolulu

3140 Waialae Avenue - Honolulu, HI 96816

[www.chaminade.edu](http://www.chaminade.edu)

**Course Number:** BC 334L (*Cross-listed with CH 334L*)

**Course Title:** Analytical Chemistry Lab

**School Name:** Natural Sciences and Mathematics

**College/School/Division Name:** NSM, Division of Chemistry and Biochemistry

**Term:** Spring 2025

**Course Credits:** 1

**Class Meeting Days/Location/Time for each section:**

Section 01	Monday	Henry Hall, L8 Laboratory	2:30 – 5:20 PM
Section 02	Friday	Henry Hall, L8 Laboratory	2:30 – 5:20 PM

**Instructor Name:** Dr. Kelvin Frazier

**Email:** [kelvin.frazier@chaminade.edu](mailto:kelvin.frazier@chaminade.edu)

**Office Location:** Henry Hall 206C

**Office Hours:**

T 12:00pm-1:00pm using Calendly <https://calendly.com/kelvin-frazier>

### **1. University Course Catalog Description**

One three-hour laboratory period per week to accompany CH 334. Separation techniques and quantitative identifications of chemical entities are discussed, including gravimetric, volumetric, and spectrophotometric analyses. Students will gain an understanding of many chemical techniques used in the qualitative and quantitative analysis of a variety of samples. In addition to learning basic analytical laboratory skills, students will become familiar with sampling techniques, statistical treatment of data, propagation of error, maintenance of a laboratory notebook, and the use of software to manage chemical data.

### **2. Course Overview**

This course gives an introduction to the student classical wet and instrumental analysis. Emphasis will be given to the methods commonly used in a standard laboratory setting. Raw data from the analysis will be processed to a format that is acceptable current standard of scientific writing.

### **3. Course Prerequisites**

- Completion of BC/CH 204 and BC/CH 323
- Concurrent registration in BC/CH 334 required

### **4. Required Learning Materials**

- No laboratory manual is required. Experimental procedures will be posted on Canvas prior to the scheduled lab meetings. It is your responsibility to read this material prior to class and be prepared for upcoming experiments.

- Students are required to wear fully enclosed shoes, laboratory coats and safety glasses in lab at all times. Long pants are also highly recommended underneath laboratory coats.
- A laboratory notebook (composition book) and scientific calculator are required and should be brought to each class. You will not be permitted to use your cell phone as a calculator.
- A mobile device (phone, tablet, or laptop) is required for quizzes.
- A tablet or laptop are recommended to be brought to class during each period to use spreadsheet functions

## 5. Technical Assistance for Canvas Users:

- Search for help on specific topics at [help.instructure.com](http://help.instructure.com)
- [Chat live with Canvas Support 24/7/365](#)
- Watch this [video to get you started](#) with online guides and tutorials
- Contact the Chaminade IT Helpdesk for technical issues: [helpdesk@chaminade.edu](mailto:helpdesk@chaminade.edu), or call (808) 735-4855

## 6. Assessment

The course grades will be based on the following point total and scale. Any changes will be announced in class.

<u>Assignment</u>	<u>Weighted Percent</u>
Pe-Lab Quiz	10%
Lab Notebook Quiz	15%
Lab Report	40%
Oral Presentation	25%
Attendance	10%

<u>Assignment</u>	<u>Points</u>
Pe-Lab Quizzes	10
Lab Notebook Quizzes	15
Lab Report	40
Oral Presentation	25
Attendance	10

***Grades will strictly not be curved, and letter grades will be assigned as follows:***

<u>GRADE</u>	<u>Percentage</u>	
A	90 – 100%	Outstanding scholarship and an unusual degree of intellectual initiative
B	80 – 89%	Superior work done in a consistent and intellectual manner
C	70 – 79%	Average grade indicating a competent grasp of subject matter
D	60 – 69%	Inferior work of the lowest passing grade, not satisfactory for fulfillment of prerequisite course work
F	Below 60%	Failed to grasp the minimum subject matter; no credit given

There is no “extra credit” for BC/CH 334L and no rounding up on Final Grades.

## Lab Notebooks

The lab notebook is where all notes, raw data and calculations for experiments will be documented as well as who participated in the experiment and when the experiment occurred. Lab notebooks is recommended to be bound, written in blue or black ink, and have pages numbered. Mistakes happen and are expected; however, they still need to be readable, thus mistakes are only to be crossed out with a single line and NO correction tape/white out should be used. Lab notebooks should not be rewritten to make it look prettier. Notebooks will be checked at the end of each lab meeting to assess completion and accuracy.

The first page of your lab notebook should be a table of contents that include the following information:

[date(s) of experiment, experiment title, page number]

Each entry for a LAB experiment should include:

- Title
- Purpose
- Introduction (some key points/equations)
- Procedure Notes / Data Collected (actual data recorded from instruments)
- Calculations (show your work for any calculations here)

## Lab Reports

The lab reports will be evaluated for completion and accuracy of the information required. They should be brief and concise, and contain the following:

- An abstract describing the purpose of the experiment, the method used, and the results obtained
- Any relevant chemical equations
- Sample calculations
- Sources of error and statistical treatment of data

## 7. Program Learning Outcomes

### Biochemistry Mission Statement

Biochemistry is the study of the living organism at the molecular level. It draws on techniques from a broad spectrum of specialized branches of chemistry to study the molecular basis of vital processes. The mission of the Biochemistry Major program at Chaminade is to deliver an excellent education in biological chemistry, preparing students to be innovative, rigorous, and well-trained scientists, educators or health practitioners. The biochemistry degree program recognizes that chemistry is “the central science” and that biochemical processes are essential to all life on our planet. The biochemistry major is composed of sophisticated intellectual content and practical experiences. Students will be exposed to contemporary ideas in biology, a challenging range of chemistry courses and rigorous laboratory courses involving modern techniques and advanced instrumentation. Application of the scientific method, statistical and presentation skills, and critical evaluation of data are foundational to the course progression in the major, which culminates in a capstone research experience. Our undergraduate students experience an education that reflects the research interests and expertise of the faculty, specifically targeting the areas of natural products, synthetic and computational chemistry, cell and molecular biology, signal transduction, genetics and genomics, and integrative biology. The curriculum is synthesized with a rich program of available development activities including internships, conference attendance and preparation activities for the health professions and graduate school.

The vision of the Biochemistry major is linked to key components of the Chaminade educational experience. Our close-knit faculty fosters education in the family spirit, and the rapid progress in techniques and ideas that hallmark biology and chemistry drive our determination to prepare students who can adapt and change. Ultimately, the goal of science is to understand the mysteries of nature and improve the human condition, while

recognizing the crucial hierarchy of all organisms within multi-level ecosystems. In particular, the goal of modern biochemistry is to develop novel molecules that address global problems, such as innovative therapies for disease, novel energy sources, and new biomaterials.

### Program Learning Outcomes in Biochemistry

Upon completion of the undergraduate program in biochemistry, students will be able to:

1. Appraise and articulate biochemical processes based on the fundamentals of organic chemistry, inorganic chemistry, analytical chemistry, physical chemistry, and biology as part of their integral and quality education.
2. Construct and employ effective and safe laboratory skills utilizing modern scientific instrumentation and techniques.
3. Analyze, compare, and formulate an interpretation of biochemical data and problems as applied to living organisms and the environment.
4. Assemble and assess biological data and compose a scientific analysis report or presentation.

Course Learning Outcomes	PL O 1	PL O 2	PL O 3	PL O 4
1. Apply quantitative chemical analysis.	X		X	
2. Interpret experimental results and draw reasonable conclusions. Identify sources of error in chemical experiments.	X	X	X	
3. Prepare accurate and precise quantitative measurements. Collect legible and complete experimental records.	X	X	X	X
4. Collaborate with peers in obtaining and interpreting data.	X			X

### Marianist Values (MVs) and Native Hawaiian Values (NHVs) for BCCH 334L

The Natural Sciences Division provides an *integral, quality education*: sophisticated integrative course content taught by experienced, dedicated, and well-educated instructors.

- *We educate in family spirit* – every classroom is an *Ohana* and you can expect to be respected yet challenged in an environment that is supportive, inclusively by instructors who take the time to personally get to know and care for you.
- *We educate for service, justice, and peace*, since many of the most pressing global issues (climate change, health inequity, poverty, justice) are those which science and technology investigate, establish ethical parameters for, and offer solutions to.
- *We educate for adaptation and change*. In science and technology, the only constant is change. Data, techniques, technologies, questions, interpretations, and ethical landscapes are constantly evolving, and we teach students to thrive on this dynamic uncertainty.

The study of science and technology can be formative, exploring human creativity and potential in the development of technologies and scientific solutions, the opportunity to engage in the stewardship of the natural world, and the opportunity to promote social justice. We provide opportunities to engage with the problems that face Hawai'i and the Pacific region through the Natural Sciences curriculum, in particular those centered around severe challenges in health, poverty, environmental resilience, and erosion of traditional culture. The Marianist Educational Values relate to Native Hawaiian ideas of *mana*, *na'auao*, *ohana*, *aloha*, and *aina*. We intend for our Natural Sciences programs to be culturally-sustaining, rooted in our Hawaiian place, and centered on core values of *Maiau*, be neat, prepared, and careful in all we do; *Makawalu*, demonstrate foresight and planning; *'Ai*, sustain mind and body; *Pa'a Na'au*, learn deeply

## **8. Course Policies**

### **Late Work Policy**

It is important to communicate with your instructor so that they can help you meet the learning objectives of the course.

Please be sure to let your instructor know in advance if you cannot attend class for any reason and provide written documentation from a third party to validate the excuse.

- Unexcused absences for two consecutive weeks may result in being withdrawn from the course by the instructor.
- A planned, excused absence must be communicated to the instructor at least one week prior to the class. Necessary arrangements will be made to meet student learning objectives.
- An unplanned, excused absence must be communicated to the instructor within one week of the missed class. Necessary arrangements will be made to meet student learning objectives.

Determination of valid excuses for missed classes is at the sole discretion of the instructor.

Student athletes should communicate absences to the instructor with the earliest possible notice. Students are not allowed to miss class for practices.

### **Grades of "Incomplete"**

Students and instructors may negotiate an incomplete grade when there are specific justifying circumstances. When submitting a grade, the "I" will be accompanied by the alternative grade that will automatically be assigned after 90 days. These include IB, IC, ID, and IF. If only an "I" is submitted, the default grade is F. The completion of the work, evaluation, and reporting of the final grade is due within 90 days after the end of the semester or term. This limit may not be extended.

### **Writing Policy**

Plagiarism will not be tolerated and will be checked.

### **Instructor and Student Communication**

Questions for this course can be emailed to the instructor at [francis.sakai-kawada@chaminade.edu]. I respond to student emails by the next school day in most cases. Typically, this will be within 24 hours, but response time may be longer for e-mails sent during the evening, weekend, or holidays. It is the responsibility of the student to check their email frequently.

### **Cell phones, tablets, and laptops**

*Music Devices and Cellular Phones:* Unless specifically permitted by your instructor, use of music devices and cell phones is prohibited during all Natural Science and Mathematics classes, as it is discourteous and may lead to suspicion of academic misconduct. Students unable to comply will be asked to leave class.

Out of consideration for your classmates, please set your cell phone to silent mode during class. Students are encouraged to bring laptops or tablets to class, as the instructor will assign online activities and readings that will require the use of a laptop or tablet. Laptops and tablets should not be misused, such as checking distracting websites. Use your best judgment and respect your classmates and instructor.

### **ADA Policy**

Chaminade University of Honolulu is committed to providing reasonable accommodations for persons with documented disabilities. If you need individual accommodations to meet course outcomes because of a documented disability, please speak with me to discuss your needs as soon as possible so that we can ensure

your full participation in class and fair assessment of your work. Students with special needs who meet criteria for the Americans with Disabilities Act (ADA) provisions must provide written documentation of the need for accommodations from Kōkua 'Ike by the end of week three of the class, in order for instructors to plan accordingly. If a student would like to determine if they meet the criteria for accommodations, they should contact the Kōkua 'Ike Coordinator at (808) 739-8305 for further information ([ada@chaminade.edu](mailto:ada@chaminade.edu)).

### **Title IX Compliance**

Chaminade University of Honolulu recognizes the inherent dignity of all individuals and promotes respect for all people. Sexual misconduct, physical and/or psychological abuse will NOT be tolerated at CUH. If you have been the victim of sexual misconduct, physical and/or psychological abuse, we encourage you to report this matter promptly. As a faculty member, I am interested in promoting a safe and healthy environment, and should I learn of any sexual misconduct, physical and/or psychological abuse, I must report the matter to the Title IX Coordinator. If you or someone you know has been harassed or assaulted, you can find the appropriate resources by visiting Campus Ministry, the Dean of Students Office, the Counseling Center, or the Office for Compliance and Personnel Services.

### **Academic Conduct Policy**

From the 2020-2021 Undergraduate Academic Catalog (p. 13):

Campus life is a unique situation requiring the full cooperation of each individual. For many, Chaminade is home, school, recreation center, and work, all in one. That makes it a community environment in which the actions of one student may directly affect other students. Therefore, each person must exercise a high degree of responsibility. The university expects students to remain in good conduct standing, which is defined as not currently being under a resolution status (i.e., student conduct probation, suspension, or expulsion). Please refer to the Student Handbook for more details. A copy of the Student Handbook is available on the Chaminade website.

For further information, please refer to the Student Handbook:

<https://chaminade.edu/wp-content/uploads/2021/04/NEW-STUDENT-HANDBOOK-20-21-Final-3.31.2021.pdf>

### **Credit Hour Policy**

The unit of semester credit is defined as university-level credit that is awarded for the completion of coursework. One credit hour reflects the amount of work represented in the intended learning outcomes and verified by evidence of student achievement for those learning outcomes. Each credit hour earned at Chaminade University should result in 45 hours of engagement. This equates to one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work each week for approximately fifteen weeks for one semester, 10-week term, or equivalent amount of work over a different amount of time.

Direct instructor engagement and out-of-class work result in total student engagement time of 45 hours for one credit.

The minimum 45 hours of engagement per credit hour can be satisfied in fully online, internship, or other specialized courses through several means, including (a) regular online instruction or interaction with the faculty member and fellow students and (b) academic engagement through extensive reading, research, online discussion, online quizzes or exams; instruction, collaborative group work, internships, laboratory work, practica, studio work, and preparation of papers, presentations, or other forms of assessment. This policy is in accordance with federal regulations and regional accrediting agencies.

*The instructor may modify elements of this syllabus according to the operational needs of the class.*

## BC/CH 334L Course Schedule Spring 2025

The Professor may modify elements of this syllabus according to the operational needs of the class

Week	Dates	Experiment
1	Section 01: 1/6 Section 02: 1/10	Lab Check-In: Syllabus and Safety Information
2	Section 01: 1/13 Section 02: 1/17	Tools of the Trade
3	Section 01: 1/20 Section 02: 1/24	<b>HOLIDAY: MARTIN LUTHER KING JR. DAY</b>
4	Section 01: 1/27 Section 02: 1/31	<b>Lab 1A: Gravimetric Determination of Calcium</b>
5	Section 01: 2/3 Section 02: 2/7	<b>Lab 1A: Gravimetric Determination of Calcium</b>
6	Section 01: 2/10 Section 02: 2/14	<b>Lab 1B: EDTA Titration of Calcium</b>
7	Section 01: 2/17 Section 02: 2/21	<b>HOLIDAY: PRESIDENT'S DAY</b>
8	Section 01: 2/24 Section 02: 2/28	<b>Lab 2A: Gravimetric Analysis of Iron</b>
9	Section 01: 3/3 Section 02: 3/7	<b>Lab 2B: Spectrophotometric Analysis of Iron</b> <b>Lab 1 Report Due</b> <b>Pitch Lab 3 Procedure</b>
10	Section 01: 3/10 Section 02: 3/14	<b>Lab 3: Characterization of BBQ Sauce Preparation</b>
11	Section 01: 3/17 Section 02: 3/21	<b>SPRING RECESS</b>
12	Section 01: 3/24 Section 02: 3/28	<b>Lab 3: Characterization of BBQ Sauce</b> <b>Lab 2 Report Due</b>
13	Section 01: 3/31 Section 02: 4/4	<b>Lab 3: Characterization of BBQ Sauce (Additional Time)</b>
14	Section 01: 4/7 Section 02: 4/11	<b>Lab 3 Report Due</b>
15	Section 01: 4/14 Section 02: 4/18	<b>HOLIDAY: Good Friday</b>
16	Section 01: 4/21 Section 02: 4/25	<b>LAST DAY OF INSTRUCTION/Oral Presentation Due</b>

### Credit Hours:

3 hour per class lab.	(Subtotal = 21)
1 hours of review/repeat review/memorization per class lab.	(Subtotal = 4)
1 hours of safety quiz preparation per quiz (4 quizzes)	(Subtotal = 4)
1 hours of lab notebook quiz	(Subtotal = 4)
3 hours of lab report writing	(Subtotal = 9)
3 hours for Oral Presentation preparation and recording	(Subtotal = 3)

Total Hours = **45**