



Chaminade
University
OF HONOLULU

Course Syllabus

Chaminade University Honolulu

3140 Waialae Avenue - Honolulu, HI 96816

www.chaminade.edu

Course Number: CH324-01 (*Cross-listed with BC 324-01*)

Course Title: Organic Chemistry II

Department Name: Natural Sciences and Mathematics

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

Term: Spring 2023

Course Credits: 4

Class Meeting Days/Location/Time for each section:

Tuesday, Thursday Kieffer hall 10 11:30 – 12:50 PM

Thursday (4th hour) 1:00 – 1:50 PM

Instructor Name: Duk Hwan Kim

Email: duk.kim@chaminade.edu

Office Location: Henry lab 7/8

Office Hours:

Tuesday and Wednesday 1:30 – 2:30 PM

OR by appointment

1. University Course Catalog Description

Spectroscopic methods such as IR, NMR, MS, and UV/VIS are introduced to solve structural identifications of the different classes of compounds studies in the first semester. The chemistry of carbonyl compounds is investigated in detail and principles of multi-step syntheses are introduced. Biologically relevant molecules such as saccharides, amino acids, peptides, and nucleic acids are studies with the strong implication that structural features and principal chemical behaviors of these molecules are related to their biological functions.

Course Prerequisites

Prerequisites: CH 323/323L. Concurrent registration in CH 324L required. Cross-listed with BC 324.

Required Learning Materials

- ISBN: 1260475611 (Get ONLY the: Connect Access Card Two Year for Organic Chemistry 6th Edition by Dr. Janice Gorzynski Smith) (Optionally, you can also purchase a loose-leaf textbook from within the online site, CONNECT, at a lower price).

- scientific calculator

- computer and/or smartphone with web/app access to CANVAS (PowerPoint Lecture Files, Worksheets, Example Exams, Example Exam Answers, and Exam Answers)

2. Course Overview

This is the second part of a two-semester course in organic chemistry. It is assumed that by now the participants have a sound understanding of the basic concepts of organic reaction mechanisms. In the next sixteen weeks we will start with topics in physical organic chemistry and gradually move into biological organic chemistry. The chemistry of aromatic compounds will provide a framework where structure-reactivity relationships are clearly laid out. An introduction to spectroscopic techniques will show how physical methods can illustrate the properties of organic compounds. As we go into the chemistry of carbonyl compounds, and sample in-depth analyses of certain reactions, comparisons with biological pathways will stand out. Meanwhile, multi-step syntheses will elucidate common logical strategies. Finally, the chemistry of carbohydrates, amino acids and nucleic acids will give the course a biological flavor.

Chemistry Mission Statement

Chemistry has justifiably been labeled 'The Central Science'. Training in this discipline is therefore beneficial for all citizens of the modern world. All materials in the universe are made up of chemicals; a knowledge of chemistry is indeed a knowledge of ourselves.

The mission of this program is to:

- Promote molecular literacy (i.e. awareness of the importance of physical, chemical, and biological changes on the atomic and molecular scale)
- Provide hands-on laboratory training using modern chemical techniques and instrumentation
- Engage students in an undergraduate research program
- Enable students to integrate knowledge of the physical world
- Educate about the entry requirements, career pathways, and progression into advanced education in the chemical sciences

Marianist Values

This class represents one component of your education at Chaminade University of Honolulu. An education in the Marianist Tradition is marked by five principles and you should take every opportunity possible to reflect upon the role of these characteristics in your education and development:

1. Education for formation in faith
2. Provide an integral, quality education
3. Educate in family spirit
4. Educate for service, justice and peace
5. Educate for adaptation and change

Native Hawaiian Values

Education is an integral value in both Marianist and Native Hawaiian culture. Both recognize the transformative effect of a well-rounded, value-centered education on society, particularly in seeking justice for the marginalized, the forgotten, and the oppressed, always with an eye toward God (Ke Akua). This is reflected in the 'OleloNo'eau (Hawaiian proverbs) and Marianist core beliefs:

1. Educate for Formation in Faith (Mana) E ola au ike akua ('OleloNo'eau 364) May I live by God
2. Provide an Integral, Quality Education (Na'auao) Lawei ka ma'alea a kū'ono'ono ('Olelo No'eau 1957)
Acquire skill and make it deep

- Educate in Family Spirit ('Ohana) 'Ikeaku, 'ikemai, kōkuaakukōkuamai; pela iho la ka nohana'ohana ('ŌleloNo'eau 1200) Recognize others, be recognized, help others, be helped; such is a family relationship
- Educate for Service, Justice and Peace (Aloha) Ka lama kū o ka no'eau ('ŌleloNo'eau 1430) Education is the standing torch of wisdom
- Educate for Adaptation and Change (Aina) 'A'ohe pau ka 'ikei ka hālauho'okahi ('ŌleloNo'eau 203) All knowledge is not taught in the same school

Program Learning Outcomes

Upon completion of the undergraduate program in Chemistry, students will have demonstrated the ability to:

- Apply the scientific method as it is used in organic chemistry, inorganic chemistry, analytical chemistry, physical chemistry, and molecular sciences.
- Recognize and explain chemical theory as it applies to the physical world.
- Visualize, evaluate, validate and interpret results of chemical analyses.
- Solve problems using analytical reasoning, professional resources, professional conduct, and ethical behavior.
- Communicate chemical information effectively in oral and written formats.

Course Learning Outcomes (CLO)

By the end of our course, students will be able to:

- Carry out the concept of aromaticity and utilize resonance theory to be able to make predictions about the rates and regioselectivity of substituted aromatic compounds in electrophilic substitution reactions.
- Identify the basic principles of infrared and nuclear magnetic resonance spectroscopy, as well as mass spectrometry as tools to determine structures of organic molecules.
- Illustrate synthetic strategies based on carbonyl group chemistry in an effort to propose regioselective multi-step syntheses of related molecules.
- Identify carbohydrate chemistry and illustrate related metabolic pathways.
- Illustrate a knowledge of various classes of nitrogen-containing compounds with particular emphasis to the reactions of and preparative routes for amines.

Alignment of Learning Outcomes

	CLO 1	CLO 2	CLO3	CLO 4	CLO 5
Marianist & Native Hawaiian Values	1, 2 & 3	1, 2 & 3	1, 2 & 3	1, 2 & 3	1, 2 & 3
Program Learning Outcomes	1, 2 & 3	1, 2, 3 & 4	1, 2 & 5	1, 2 & 3	1, 2, 3 & 5

3. Assessment

Homework

Homework problems from each chapter will be assigned via McGraw Connect. The homework will be added to your overall grade. Using McGraw Connect you will have access to all assigned Homework, electronic textbook, and other resources such as additional problems.

See below for CONNECT information:

CONNECT BY McGraw Hill

Go to:

- CANVAS.
- Once logged in, click 'BC/CH 324-1'
- Select 'Module' for the menu on the left
- Click on 'MH CAMPUS'
- Click on 'CONNECT'

Examinations

There will be three midterm exams administered this semester. These exams are tentatively scheduled to be taken on **February 16, March 16 & April 20**. More information about these exams will be given in class.

Final Exam

The final exam is scheduled for **May 1, 8:30 – 10:30 PM**. The final will be cumulative, it will encompass all the material covered in the semester. Scoring for the final exam is to be determined.

Grading Scale

Letter grades are given in all courses except those conducted on a credit/no credit basis.

The course grade will be based on the following score and scale:

- 40% = Homework
- 20% = Exam I
- 20% = Exam II
- 20% = Exam III
- TBA Final Exam

GRADE	Percentage	
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	65 – 79%	Average grade indicating a competent grasp of subject matter
D	45 – 64%	Inferior work of the lowest passing grade, not satisfactory for fulfillment of prerequisite course work
F	Below 45%	Failed to grasp the minimum subject matter; no credit given

4. Course Policies

Attendance

Attendance to the lecture is compulsory. If you miss a class for any given reason, please take the appropriate steps to catch up to the rest of the class. Attendance to the 4th hour is left to your discretion, though it is highly encouraged. Absence from any midterm examination need to be excused with a valid explanation (eg. doctor's note) otherwise you will receive a zero.

Student athletes should communicate absences with the earliest possible notice.

Late Work Policy

Late submission for online homework may be accepted given a valid excuse.

Midterms missed due to valid excuse may be rescheduled.

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.

Instructor and Student Communication

Questions for this course can be emailed to the instructor. Response to student's email will be within 24 hours but may be longer over the weekend, or holidays. It is the responsibility of the student to check their email frequently.

Cell phones, tablets, and laptops

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).

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, practical, studio work, and preparation of papers, presentations, or other forms of assessment. This policy is in accordance with federal regulations and regional accrediting agencies.

Course Schedule Spring 2023

The schedule is tentative and it may be modified according to the operational needs of the class.

Week	Dates	Topic
1	1/9–1/13	Introduction Ch 13: Radical reactions
2	1/16 – 1/20	Ch 14: Conjugations, resonance, and dienes
3	1/23 – 1/27	Ch 15: Benzene and aromatic compounds
4	1/30 – 2/3	Ch 16: Reaction of aromatic compounds
5	2/6 – 2/10	Spectroscopy: Mass spectrometry and infrared spectroscopy Spectroscopy: Nuclear Magnetic Resonance spectroscopy
6	2/13 – 2/17	Spectroscopy: Cont. Exam I on 2/16
7	2/20 – 2/24	Ch 17: Carbonyl chemistry; organometallic reagents Ch 18: Aldehydes and ketones
8	2/27 – 3/3	Ch 19: Carboxylic acids and nitriles Ch 20: Carboxylic acids and their derivatives
9	3/6 – 3/10	Ch 21: α -substitution reaction of carbonyl Ch 22: Carbonyl condensation reactions
10	3/13 – 3/17	Carbonyl chemistry cont. EXAM II on 3/16
	3/20 – 3/24	SPRING BREAK
11	3/27 – 3/31	Ch 23: Amines
12	4/3 – 4/7	Ch 24: Carbon-carbon bond formation
13	4/10 – 4/14	Ch 25: Pericyclic reactions
14	4/17 – 4/21	Organic synthesis cont. Exam III on 4/20
15	4/24 – 4/28	Ch 26: Carbohydrates
Finals Week		Scheduled for Monday (5/1) 8:30 - 10:30 am