

# University of Hawaii Maui College

## CHEM 272 - Organic Chemistry I

**1. Course Alpha. Please click on the ? to the right for help.**

CHEM

**2. Course Number. Please click on the ? to the right for help.**

272

**3. Course Title/Catalog Title. Please click on the ? to the right for help.**

Organic Chemistry I

**4. Number of Credits. Please click on the ? to the right for help.**

3

**5. Contact Hours/Type. Please click on the ? to the right for help.**

- Hour lecture (3)

**6. Course Description. Please click on the ? to the right for help.**

Introduces the first semester of a comprehensive organic chemistry course including molecular structure, nomenclature, stereochemistry, spectroscopy, reactions and reaction mechanisms, synthesis, and applications to biology. This course is intended for science majors.

**7. Pre-Requisites. Please click on the ? to the right for help.**

CHEM 162 with grade C or better, or consent.

**8. Co-requisites.**

CHEM 272L Organic Chemistry Lab I ; OR consent

YES

**9. Recommended Preparation.**

**10. Is this a cross-listed course? Please click on the ? to the right for help.**

NO

**11. Reason for Proposal. Why is this course being proposed or modified? This question requires specific information as part of the explanation. Please click on the ? to the right for help.**

Students have expressed need for organic chemistry here at UHMC. Students have been transferring

from UHMC earlier than would have planned for other academic institutions in order to fulfill their organic chemistry requirement. These students include pharmacy majors and pre-med majors. In addition UH Maui College has a new science building with appropriate infrastructure to facilitate organic chemistry laboratory instruction.

- 12. Effective Semester and Year. For new or modified courses, the effective year is one year from the semester proposed. For example, if proposed in Spring 2012, the effective semester is Spring 2013. Please click on the ? to the right for help.**

Fall 2015

- 13. Grading Method. What grading methods may be used for this course? Please click on the ? to the right for help.**

- Standard (Letter,Cr/NCr,Audit) (0)

- 14. Is this course repeatable for credit? How often can this course be counted toward a degree or certificate? Please click on the ? to the right for help.**

NO

- 15. Course Student Learning Outcomes (SLOs). DO NOT ENTER TEXT IN THE TEXT BOX BELOW. Click on the yellow button "COURSE LEARNING OUTCOMES" and enter in that screen. Please click on the ? to the right for help.**

Course SLO/Competency	Explain the basis of carbon chemistry,	Comprehend the nature (reactivity, properties) of three-dimensionality of molecules,	Interpret patterns of reactivity on the basis of mechanistic reasoning,	Design syntheses of organic molecules of moderate complexity,	Deduce molecular structures from spectroscopic data,
Explain the nature of bonding and structure.	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
Explain the physical properties associated with molecular structure.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Give common and IUPAC names for the various organic compounds studied in the first semester.	<input checked="" type="checkbox"/>				
Give complete structures from the names.	<input checked="" type="checkbox"/>				
Draw stereochemical structures and understand how stereochemistry affects physical and chemical properties.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Determine the structure of compounds from experimental data including the various spectroscopic techniques.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>
Explain how functional group structure determines chemical reactivity.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Determine the mechanism of a reaction based upon the structure of the functional group.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Give the types of reactions possible for each functional group and be	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

able to draw all possible products of a reaction.					
Determine what starting materials are necessary to synthesize a particular compound.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Cite examples of organic mechanisms in biology.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>

Course SLO/PSLO	Make effective decisions with intellectual integrity to solve problems and/or achieve goals utilizing the skills of critical thinking, creative thinking, information literacy, and quantitative/symbolic reasoning (AA, Liberal Arts)	Articulate essential underlying facts, concepts, principles, theories, and applications relating to chosen areas in physical science. (AS, Natural Science)	Apply terms, conventions and units of measurement appropriate to physical science. (AS, Natural Science)	Apply mathematical language and techniques to understand phenomena and solve problems in physical science. (AS, Natural Science)
Explain the nature of bonding and structure.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Explain the physical properties associated with molecular structure.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Give common and IUPAC names for the various organic compounds studied in the first semester.	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
Give complete structures from the names.	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
Draw stereochemical structures and understand how stereochemistry affects physical and chemical properties.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Determine the structure of compounds from experimental data including the various spectroscopic techniques.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Explain how functional group structure determines chemical reactivity.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Determine the mechanism of a reaction based upon the structure of the functional group.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Give the types of reactions possible for each functional group and be able to draw all possible products of a reaction.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Determine what starting materials are necessary to synthesize a particular compound.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Cite examples of organic mechanisms in biology.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>

- 16. Course Competencies. DO NOT ENTER TEXT IN THE TEXT BOX BELOW. Click on the yellow button "COURSE COMPETENCIES/ISSUES/SKILLS" and enter text in that screen. Course competencies are smaller, simpler tasks that connect to and facilitate the SLOs.**

Upon successful completion of CHEM 272, the student should be able to:

Competency
Explain the basis of carbon chemistry,
Comprehend the nature (reactivity, properties) of three-dimensionality of molecules,
Interpret patterns of reactivity on the basis of mechanistic reasoning,
Design syntheses of organic molecules of moderate complexity,
Deduce molecular structures from spectroscopic data,

- 17. Recommended Course Content and Timeline. The course content facilitates the course competencies. Course content may be organized by weeks, units, topics or the like.**

Content
Week 1: Bonding and Molecular Structure
Week 2: Families of Carbon Compounds
Week 3: Reactions and Mechanisms
Week 4: Introduction to Alkanes
Week 5: Introduction to Cycloalkanes
Week 6: Stereochemistry
Week 7: Ionic Reactions
Week 8: Alkenes
Week 9: Alkynes
Week 10: Alkenes II
Week 11: Alkynes II
Week 12: Radical Reactions
Week 13: Alcohol and Ethers
Week 14: Alcohols from Carbonyl Compounds
Week 15: Infrared Spectroscopy
Week 16: Final Exam

- 18. Program Learning Outcomes. DO NOT ENTER TEXT IN THE TEXT BOX BELOW. Click on the**

yellow button "PLOs" and enter text in that screen. Program Student Learning Outcomes (PLOs) supported by this course. If you are not a "program" use the Liberal Arts PLOs, view them by clicking on ? icon to the right.

Program SLO
Make effective decisions with intellectual integrity to solve problems and/or achieve goals utilizing the skills of critical thinking, creative thinking, information literacy, and quantitative/symbolic reasoning (AA, Liberal Arts)
Articulate essential underlying facts, concepts, principles, theories, and applications relating to chosen areas in physical science. (AS, Natural Science)
Apply terms, conventions and units of measurement appropriate to physical science. (AS, Natural Science)
Apply mathematical language and techniques to understand phenomena and solve problems in physical science. (AS, Natural Science)

19. College-wide Academic Student Learning Outcomes (CASLOs). FIRST, fill out the CASLO grid located in the UHMC tab above. Click on the HELP icon for tips on determining support for the CASLOs and indicate your choices below by clicking on the box in front of each supported CASLO. NOTE: Our campus does not use the Preparatory Level, Level 1 and Level 2 designations in the chart below.

	<b>Creativity</b> - Able to express originality through a variety of forms.
<input checked="" type="checkbox"/>	<b>Critical Thinking</b> - Apply critical thinking skills to effectively address the challenges and solve problems.  <input checked="" type="checkbox"/> Level 2
	<b>Information Retrieval and Technology</b> - Access, evaluate, and utilize information effectively, ethically, and responsibly.
	<b>Oral Communication</b> - Practice ethical and responsible oral communications appropriately to a variety of audiences and purposes.
<input checked="" type="checkbox"/>	<b>Quantitative Reasoning</b> - Synthesize and articulate information using appropriate mathematical methods to solve problems of quantitative reasoning accurately and appropriately.  <input checked="" type="checkbox"/> Level 2
	<b>Written Communication</b> - Write effectively to convey ideas that meet the needs of specific audiences and purposes.

GenED SLO
Critical Thinking - Apply critical thinking skills to effectively address the challenges and solve problems.
Quantitative Reasoning - Synthesize and articulate information using appropriate mathematical

methods to solve problems of quantitative reasoning accurately and appropriately.

**20. Linking. CLICK ON CHAIN LINK ICON IN UPPER RIGHT HAND CORNER TO BEGIN LINKING. Please click on the ? to the right for help.**

**21. Method(s) of delivery appropriate for this course. Please click on the ? to the right for help.**

- Classroom/Lab (0)

**22. Text and Materials, Reference Materials, and Auxiliary Materials. Please click on the ? to the right for help.**

- T.W.G. Solomons and C.B. Fryhle. Organic Chemistry. 10th Edition. .
- Leroy Wade. Organic Chemistry. 8th. Pearson, 2013.
- Francis Carey and Robert Giuliano. Organic Chemistry. 8th. McGraw Hill, 2010.
- John McMurry. Organic Chemistry. 8th. Brooks Cole Publishers, 2011.

**23. Maximum enrollment. Please click on the ? to the right for help.**

35

**24. Particular room type requirement. Is this course restricted to particular room type? Please click on the ? to the right for help.**

NO

**25. Special scheduling considerations. Are there special scheduling considerations for this course? Please click on the ? to the right for help.**

NO

**26. Are special or additional resources needed for this course? Please click on the ? to the right for help.**

Resources from publisher

**27. Does this course require special fees to be paid for by students? Please click on the ? to the right for help.**

NO

**28. Does this course change the number of required credit hours in a degree or certificate? Please click on the ? to the right for help.**

NO

**29. Course designation(s) for the Liberal Arts A.A. degree and/or for the college's other associate degrees. Please click on the ? to the right for help.**

Degree	Program	Category
<b>Associate in Arts:</b>	Liberal Arts	DP - Physical DY - Lab
<b>AS:</b>	ANY	NS - Natural Science
<b>AAS:</b>	ANY	NS - Natural Science
<b>BAS:</b>	ANY	NS - Natural Science
<b>Developmental/ Remedial:</b>	Developmental	

**30. Course designation(s) for other colleges in the UH system.**

University of Hawai'i Manoa, CHEM 272, Organic Chemistry I, 3 credits

University of Hawai'i, Honolulu Community College, CHEM 272, Organic Chemistry I, 3 credits

University of Hawai'i, Kapiolani Community College, CHEM 272, Organic Chemistry I, 3 credits

University of Hawai'i, Leeward Community College, CHEM 272, Organic Chemistry I, 3 credits

University of Hawai'i, Windward Community College, CHEM 272, Organic Chemistry I, 3 credits

University of Hawai'i at Hilo, CHEM 241, Organic Chemistry I, 3 credits

**31. Indicate the year and page # of UHMC catalog referred to. For new or modified courses, please indicate the catalog pages that need to be modified and provide a sheet outlining those changes.**

2014-2015 University of Hawaii. Maui College General Catalog page 19.

2014-2015 University of Hawaii. Maui College General Catalog page 21.

2014-2015 University of Hawaii. Maui College General Catalog page 22.

2014-2015 University of Hawaii. Maui College General Catalog page 23.

2014-2015 University of Hawaii. Maui College General Catalog page 104.

**32. College-wide Academic Student Learner Outcomes (CASLOs). Please click on the HELP icon for more information.**

<b>Standard 1 - Written Communication</b> <b>Write effectively to convey ideas that meet the needs of specific audiences and purposes.</b>		
<b>Outcome 1.1 - Use writing to discover and articulate ideas.</b>		1
<b>Outcome 1.2 - Identify and analyze the audience and purpose for any intended communication.</b>		1

<b>Outcome 1.3 - Choose language, style, and organization appropriate to particular purposes and audiences.</b>		0
<b>Outcome 1.4 - Gather information and document sources appropriately.</b>		1
<b>Outcome 1.5 - Express a main idea as a thesis, hypothesis, or other appropriate statement.</b>		1
<b>Outcome 1.6 - Develop a main idea clearly and concisely with appropriate content.</b>		1
<b>Outcome 1.7 - Demonstrate a mastery of the conventions of writing, including grammar, spelling, and mechanics.</b>		0
<b>Outcome 1.8 - Demonstrate proficiency in revision and editing.</b>		0
<b>Outcome 1.9 - Develop a personal voice in written communication.</b>		0
<b>Standard 2 - Quantitative Reasoning</b> Synthesize and articulate information using appropriate mathematical methods to solve problems of quantitative reasoning accurately and appropriately.		
<b>Outcome 2.1 - Apply numeric, graphic, and symbolic skills and other forms of quantitative reasoning accurately and appropriately.</b>		3
<b>Outcome 2.2 - Demonstrate mastery of mathematical concepts, skills, and applications, using technology when appropriate.</b>		2
<b>Outcome 2.3 - Communicate clearly and concisely the methods and results of quantitative problem solving.</b>		2
<b>Outcome 2.4 - Formulate and test hypotheses using numerical experimentation.</b>		2
<b>Outcome 2.5 - Define quantitative issues and problems, gather relevant information, analyze that information, and present results.</b>		3
<b>Outcome 2.6 - Assess the validity of statistical conclusions.</b>		3
<b>Standard 3 - Information Retrieval and Technology.</b> Access, evaluate, and utilize information effectively, ethically, and responsibly.		
<b>Outcome 3.1 - Use print and electronic information technology ethically and responsibly.</b>		0
<b>Outcome 3.2 - Demonstrate knowledge of basic vocabulary, concepts, and operations of information retrieval and technology.</b>		1
<b>Outcome 3.3 - Recognize, identify, and define an information need.</b>		0
<b>Outcome 3.4 - Access and retrieve information through print and electronic media, evaluating the accuracy and authenticity of that information.</b>		0
<b>Outcome 3.5 - Create, manage, organize, and communicate information through electronic media.</b>		0
<b>Outcome 3.6 - Recognize changing technologies and make informed choices about their appropriateness and use.</b>		1
<b>Standard 4 - Oral Communication</b> Practice ethical and responsible oral communications appropriately to a variety of audiences and purposes.		



<b>Outcome 4.1 - Identify and analyze the audience and purpose of any intended communication.</b>		0
<b>Outcome 4.2 - Gather, evaluate, select, and organize information for the communication.</b>		1
<b>Outcome 4.3 - Use language, techniques, and strategies appropriate to the audience and occasion.</b>		0
<b>Outcome 4.4 - Speak clearly and confidently, using the voice, volume, tone, and articulation appropriate to the audience and occasion.</b>		0
<b>Outcome 4.5 - Summarize, analyze, and evaluate oral communications and ask coherent questions as needed.</b>		1
<b>Outcome 4.6 - Use competent oral expression to initiate and sustain discussions.</b>		1
<b>Standard 5 - Critical Thinking</b> Apply critical thinking skills to effectively address the challenges and solve problems.		
<b>Outcome 5.1 - Identify and state problems, issues, arguments, and questions contained in a body of information.</b>		3
<b>Outcome 5.2 - Identify and analyze assumptions and underlying points of view relating to an issue or problem.</b>		2
<b>Outcome 5.3 - Formulate research questions that require descriptive and explanatory analyses.</b>		3
<b>Outcome 5.4 - Recognize and understand multiple modes of inquiry, including investigative methods based on observation and analysis.</b>		2
<b>Outcome 5.5 - Evaluate a problem, distinguishing between relevant and irrelevant facts, opinions, assumptions, issues, values, and biases through the use of appropriate evidence.</b>		3
<b>Outcome 5.6 - Apply problem-solving techniques and skills, including the rules of logic and logical sequence.</b>		3
<b>Outcome 5.7 - Synthesize information from various sources, drawing appropriate conclusions.</b>		3
<b>Outcome 5.8 - Communicate clearly and concisely the methods and results of logical reasoning.</b>		2
<b>Outcome 5.9 - Reflect upon and evaluate their thought processes, value system, and world views in comparison to those of others.</b>		0
<b>Standard 6 - Creativity</b> Able to express originality through a variety of forms.		
<b>Outcome 6.1: Generate responses to problems and challenges through intuition and non-linear thinking.</b>		1
<b>Outcome 6.2: Explore diverse approaches to solving a problem or addressing a challenge.</b>		1
<b>Outcome 6.3: Sustain engagement in activities without a preconceived purpose.</b>		0
<b>Outcome 6.4: Apply creative principles to discover and express new ideas.</b>		1
<b>Outcome 6.5: Demonstrate the ability to trust and follow one's instincts in the absence of external direction</b>		0
<b>Outcome 6.6: Build upon or adapt the ideas of others to create novel expressions or</b>		1

**new solutions.**

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### 33. Additional Information

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**UNIVERSITY OF HAWAII MAUI COLLEGE  
ASSOCIATE IN ARTS DEGREE  
REVIEW OF COURSES FOR DIVERSIFICATION REQUIREMENTS**

Any UH course with a diversification or equivalent designation that transfers to another UH campus will be accepted with the sending campus' designation. At each participating UH campus, the diversification designation is consistent with the hallmarks described below. Courses are approved through a campus level process and reviewed at least every five years to ensure that the course continues to meet the hallmarks.

**SUBJECT ALPHA: CHEMCOURSE NUMBER: 272**

If the course is cross-listed, please provide the cross-listing: Subject \_\_\_\_\_ Course # \_\_\_\_\_

**COURSE TITLE: Organic Chemistry I**

**UH MANOA DIVERSIFICATION CATEGORY:**

**UHMC RECOMMENDED CATEGORY: DP**

(Refer to attached Hallmarks)

Banner Input Date: \_\_\_\_\_

Catalog Input Date: \_\_\_\_\_

STAR Check Date: \_\_\_\_\_

AA Advising Sheet  
Update Date: \_\_\_\_\_

Is the course outline, on file with the UHMC Curriculum Committee, consistent with the stated Hallmarks?  Yes  No

If "No" and you wish to submit changes to correspond with the Hallmarks, attach a University of Hawaii Maui College Curriculum Action Request (CAR) (Form 4-93) with new course outline.

OR

Recommend course be changed to another sub-category: \_\_\_\_\_

OR

Recommend course be used only as general elective

PETER VIRGIL FISHER

Instructor's Printed Name



Instructor's Signature

11/12/14

Date

Michael Takemoto

Approved by: Diversification Chair Printed Name



Diversification Chair Signature

11/12/14

Date