

2014.45

University of Hawaii Maui College
CHEM 272L - Organic Chemistry Lab 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.**

272L

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

Organic Chemistry Lab I

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

1

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

- Hour lab (3)

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

Introduces standard laboratory principles of organic chemistry including proficient use of laboratory equipment, manipulation of organic materials, laboratory safety, 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 162L with grade C or better, or consent.

8. **Co-requisites.**

CHEM 272 Organic Chemistry 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 the new science building at UH Maui College has the 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	Gain competency using organic laboratory equipment and general organic chemistry laboratory operations.	Become familiar with and source organic compounds by IUPAC nomenclature, understand functional group reactivities and mechanism of organic reactions studied.	Be able to draw all possible products of a reaction and determine what starting materials are necessary for the synthesis of proposed compound.	Explain how physical properties are used to isolate organic compounds and to be able to design an organic synthesis and clearly communicate this process.	Clearly communicate observations and procedures in a laboratory notebook.
Gain competency using organic laboratory equipment.	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Gain competency with organic laboratory procedures.	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	
Give IUPAC names for the various organic compounds studied in Chemistry 272.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Describe how functional group structure determines chemical reactivity.		<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"/>		
Be able to draw all possible			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

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"/>	
Explain how physical properties are used to isolate organic compounds.				<input checked="" type="checkbox"/>	
Explain the processes utilized in the design of organic synthesis, and to communicate these using a flow diagram.			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Be able to record observations and procedures in a laboratory notebook, and to clearly communicate results and conclusions.	<input checked="" type="checkbox"/>	<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)	Explain the natural and technological world using reflection and quantitative analysis to prepare a plan; to collect, process, and interpret data; to communicate conclusions; and to evaluate the plan, procedures and findings. (AS, Natural Science)	Relate scientific knowledge and understanding to address familiar and unfamiliar situations in order to plan and carry out project work. (AS, Natural Science)	Assess information using scientific theories and concepts from a range of sources in order to make sound judgments. (AS Natural Science)
Gain competency using organic laboratory equipment.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Gain competency with organic laboratory procedures.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Give IUPAC names for the various organic compounds studied in Chemistry 272.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Describe how functional group structure determines chemical reactivity.	<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"/>
Be able to draw all possible products of a reaction.	<input checked="" type="checkbox"/>	<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"/>	<input checked="" type="checkbox"/>
Explain how physical properties are used to isolate organic compounds.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Explain the processes utilized in the design of organic synthesis, and to communicate these using a flow diagram.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Be able to record observations and procedures in a laboratory notebook, and to clearly communicate results and conclusions.	<input checked="" type="checkbox"/>	<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 272L, the student should be able to:

Competency
Gain competency using organic laboratory equipment and general organic chemistry laboratory operations.
Become familiar with and source organic compounds by IUPAC nomenclature, understand functional group reactivities and mechanism of organic reactions studied.
Be able to draw all possible products of a reaction and determine what starting materials are necessary for the synthesis of proposed compound.
Explain how physical properties are used to isolate organic compounds and to be able to design an organic synthesis and clearly communicate this process.
Clearly communicate observations and procedures in a laboratory notebook.

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: Introduction and Lab Safety
Week 2: Distillation
Week 3: Distillation Unknown and Melting Points
Week 4: Crystallization
Week 5: Thin Layer Chromatography
Week 6: Class Discussion
Week 7: Steam Distillation
Week 8: Extraction
Week 9: Column Chromatography
Week 10: Synthesis of Ester Fragrances
Week 11: Bromobutane
Week 12: Oxidation of Cyclohexanol

Week 13: Class Discussion
Week 14: Transfer Hydrogenation of Olive Oil
Week 15: Polymers
Week 16: Check out and Submission of Lab Notebook

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)
Explain the natural and technological world using reflection and quantitative analysis to prepare a plan; to collect, process, and interpret data; to communicate conclusions; and to evaluate the plan, procedures and findings. (AS, Natural Science)
Relate scientific knowledge and understanding to address familiar and unfamiliar situations in order to plan and carry out project work. (AS, Natural Science)
Assess information using scientific theories and concepts from a range of sources in order to make sound judgments. (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.

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

	Written Communication - Write effectively to convey ideas that meet the needs of specific audiences and purposes.
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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.

- Williamson and Masters. Macroscale and Microscale Organic Experiments. 6th. Brooks Cole Publishers, 2010.
- Mayo, Pike and Forbes. Microscale Organic Lab with Multistep and Multiscale Synthesis. 5th. Wiley, 2011.
- Zubrich. Organic Chemistry Lab Survival Manual: Guide to Techniques. 9th. Wiley, 2012.

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

20 students per section

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

YES

CHEM272L requires a dedicated laboratory specific for organic chemistry laboratory operations. IKE LEA A119 Chemistry Laboratory.

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.

Organic Chemistry textbook used in the lecture or found in the library; website of organic chemistry courses.

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
Associate in Arts:	Liberal Arts	DY - Lab DP - Physical
AS:	ANY	NS - Natural Science
AAS:	N/A	NS - Natural Science
BAS:	BAS - All	NS - Natural Science
Developmental/ Remedial:	N/A	

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

University of Hawai'i Manoa, CHEM 272L, Organic Chemistry I Lab, 1 credit

University of Hawai'i, Honolulu Community College, CHEM 272L, Organic Chemistry I Lab, 1 credit

University of Hawai'i, Kapiolani Community College, CHEM 272L, Organic Chemistry I Lab, 1 credit

University of Hawai'i, Leeward Community College, CHEM 272L, Organic Chemistry I Lab, 1 credit

University of Hawai'i, Windward Community College, CHEM 272L, Organic Chemistry I Lab, 1 credit

University of Hawai'i at Hilo, CHEM 241L, Organic Chemistry I Lab, 1 credit

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.

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

Standard 1 - Written Communication Write effectively to convey ideas that meet the needs of specific audiences and purposes.		
Outcome 1.1 - Use writing to discover and articulate ideas.		1
Outcome 1.2 - Identify and analyze the audience and purpose for any intended communication.		1
Outcome 1.3 - Choose language, style, and organization appropriate to particular purposes and audiences.		0
Outcome 1.4 - Gather information and document sources appropriately.		1
Outcome 1.5 - Express a main idea as a thesis, hypothesis, or other appropriate statement.		1
Outcome 1.6 - Develop a main idea clearly and concisely with appropriate content.		1
Outcome 1.7 - Demonstrate a mastery of the conventions of writing, including grammar, spelling, and mechanics.		0
Outcome 1.8 - Demonstrate proficiency in revision and editing.		0
Outcome 1.9 - Develop a personal voice in written communication.		0
Standard 2 - Quantitative Reasoning Synthesize and articulate information using appropriate mathematical methods to solve problems of quantitative reasoning accurately and appropriately.		
Outcome 2.1 - Apply numeric, graphic, and symbolic skills and other forms of quantitative reasoning accurately and appropriately.		3
Outcome 2.2 - Demonstrate mastery of mathematical concepts, skills, and applications, using technology when appropriate.		2
Outcome 2.3 - Communicate clearly and concisely the methods and results of quantitative problem solving.		2
Outcome 2.4 - Formulate and test hypotheses using numerical experimentation.		2
Outcome 2.5 - Define quantitative issues and problems, gather relevant information, analyze that information, and present results.		3
Outcome 2.6 - Assess the validity of statistical conclusions.		3
Standard 3 - Information Retrieval and Technology. Access, evaluate, and utilize information effectively, ethically, and responsibly.		
Outcome 3.1 - Use print and electronic information technology ethically and responsibly.		0
Outcome 3.2 - Demonstrate knowledge of basic vocabulary, concepts, and operations of information retrieval and technology.		1

Outcome 3.3 - Recognize, identify, and define an information need.	0
Outcome 3.4 - Access and retrieve information through print and electronic media, evaluating the accuracy and authenticity of that information.	0
Outcome 3.5 - Create, manage, organize, and communicate information through electronic media.	0
Outcome 3.6 - Recognize changing technologies and make informed choices about their appropriateness and use.	1
Standard 4 - Oral Communication Practice ethical and responsible oral communications appropriately to a variety of audiences and purposes.	
Outcome 4.1 - Identify and analyze the audience and purpose of any intended communication.	0
Outcome 4.2 - Gather, evaluate, select, and organize information for the communication.	1
Outcome 4.3 - Use language, techniques, and strategies appropriate to the audience and occasion.	0
Outcome 4.4 - Speak clearly and confidently, using the voice, volume, tone, and articulation appropriate to the audience and occasion.	0
Outcome 4.5 - Summarize, analyze, and evaluate oral communications and ask coherent questions as needed.	1
Outcome 4.6 - Use competent oral expression to initiate and sustain discussions.	1
Standard 5 - Critical Thinking Apply critical thinking skills to effectively address the challenges and solve problems.	
Outcome 5.1 - Identify and state problems, issues, arguments, and questions contained in a body of information.	3
Outcome 5.2 - Identify and analyze assumptions and underlying points of view relating to an issue or problem.	2
Outcome 5.3 - Formulate research questions that require descriptive and explanatory analyses.	3
Outcome 5.4 - Recognize and understand multiple modes of inquiry, including investigative methods based on observation and analysis.	2
Outcome 5.5 - Evaluate a problem, distinguishing between relevant and irrelevant facts, opinions, assumptions, issues, values, and biases through the use of appropriate evidence.	3
Outcome 5.6 - Apply problem-solving techniques and skills, including the rules of logic and logical sequence.	3
Outcome 5.7 - Synthesize information from various sources, drawing appropriate conclusions.	3
Outcome 5.8 - Communicate clearly and concisely the methods and results of logical reasoning.	2
Outcome 5.9 - Reflect upon and evaluate their thought processes, value system, and world views in comparison to those of others.	0
Standard 6 - Creativity Able to express originality through a variety of forms.	
Outcome 6.1: Generate responses to problems and challenges through intuition and	1

non-linear thinking.		
Outcome 6.2: Explore diverse approaches to solving a problem or addressing a challenge.		1
Outcome 6.3: Sustain engagement in activities without a preconceived purpose.		0
Outcome 6.4: Apply creative principles to discover and express new ideas.		1
Outcome 6.5: Demonstrate the ability to trust and follow one's instincts in the absence of external direction		0
Outcome 6.6: Build upon or adapt the ideas of others to create novel expressions or new solutions.		1

33. Additional Information

Attachments

-  Organic Chemistry Laboratory I